Appendix A

NOP of Preparation (NOP) and NOP Responses

Rincon Consultants, Inc.

Environmental Scientists Planners Engineers

MEMORANDUM

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213 788 4842

Date: January 23, 2017

To: Steve Marshall, Planning & Environmental Services Manager

Organization: City of Novato

From: Jonathan Berlin, Environmental Planner

Email: smarshall@novato.org

Re: Summary of Environmental Issues Raised at the January 12th Scoping Meeting

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Please find below a brief summary of the environmental issues raised by the Planning Commission and members of the public during the General Plan 2035 EIR Scoping Meeting that was held on January 12th, 2017 at the Novato City Hall.

Aesthetics

One commissioner raised a concern about impacts to visual quality from increased building heights in the Bel Marin Keys Master Plan area. This aesthetic concern will be analyzed in the Draft EIR.

Growth-inducing Impacts

Greenbelt Alliance staff expressed concern that a renewed urban growth boundary would result in growth-inducing impacts if adopted by the city council instead of by a public vote. However, considering the potential environmental effects of the manner of adoption would be speculative and is not a CEQA issue.

Hazards and Hazardous Materials

A member of the public expressed concern that the Ignacio Boulevard interchange at Highway 101 could be damaged during an earthquake, preventing evacuation from Bel Marin Keys. The commenter did not present any evidence that the interchange is seismically unsafe, and this concern is speculative.

However, the Draft EIR will generally consider potential impacts from interfering with an adopted emergency response plan or emergency evacuation plan.

Recreation

A member of the public expressed concern about the supply of open space for business park employees in Bel Marin Keys. Demand of open space or recreational facilities is typically assessed for residents, not for employees. The Draft EIR will analyze overall demand for parks and recreational facilities based on projected population growth and City estimates of per capita park demand.

Transportation

A member of the public expressed concern that the General Plan 2035 would worsen traffic congestion in Bel Marin Keys by adding trips to an area with one main access route. The Draft EIR will evaluate level of service (LOS) impacts for 32 intersections, three roadway segments, and Highway 101, based on a traffic analysis from W-Trans.

A related public request is for a second connector route to Bel Marin Keys, built from State Route 37. Annexing land from outside city limits for this route would be infeasible. Therefore, the Draft EIR will not consider this request as a potential mitigation measure for traffic impacts.

A member of the public raised a concern that the diminished parking requirement for laboratory space in Bel Marin Keys would result in an inadequate parking supply in the future (if different companies with higher parking demand come in and occupy building space). The Draft EIR will not consider this concern because it is speculative.

Greenbelt Alliance staff also expressed support for the goal of reducing vehicle miles traveled (VMT).

Alternatives

- Consider different development intensities in Bel Marin Keys
- Consider preserving open space in the North, North Redwood Corridor instead of commercial zoning. this alternative will not be considered because Novato already preserves an abundant amount of open space within city limits (42%)

Please feel free to contact us with any questions that you may have.

Sincerely,

Jonathan Berlin

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January 17, 2017

04-MRN-2016-00030
SCH # 2016122043

Mr. Steve Marshall
City of Novato
Community Development Department
922 Machin Avenue
Novato, CA 94945

Novato General Plan 2035 Update – Notice of Preparation (NOP)

Dear Mr. Marshall:

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

Project Understanding
The proposed General Plan update (Plan) will provide an update to the City of Novato's General Plan previously adopted in 1996. The Plan will provide the context to effectively plan and manage Novato, pursuant to goals and policies that reflect present-day values held by the community. Additionally, the update will equip Novato with a policy framework to responsibly manage future projects and have the capacity to accommodate the growth and development anticipated to occur in the City of Novato for the next 20 years. Regional access to and from the City is provided by US 101.

Lead Agency
As the Lead Agency, the City of Novato is responsible for all mitigation measures, including any needed improvements to the STN or reduction in VMT in association with the Plan. Any fair share contribution, financing, scheduling, implementation responsibilities and Lead Agency monitoring associated with the Plan should be fully discussed for all proposed mitigation measures.

Cultural Resources

- Cultural resource information is confidential and report distribution should be restricted from public access per California Government Code sections 6254.10 and 6254(r); California Code of Regulations Section 15120(d); and Section 304 of the National Historic Preservation Act of 1966. We recommend that the locational and other sensitive information regarding cultural resources in Appendix B be removed from public documents.
- The City of Novato should consult with the appropriate Native American tribes, groups or individuals regarding the implementation of the General Plan, in accordance with Senate Bill 18. Native Americans should also be consulted regarding Tribal Cultural Resources prior to future project approval by the City of Novato, in accordance with Assembly Bill 52. In the Cultural Resource Section on page 2-12, the phrase "State historic landmark status" should be replaced with "California Historical Landmark."
- We recommend in Section CC 1 (page 2-44), that the City of Novato include resources that also have the potential to contribute to California's and the United States' heritage. We also recommend revising the language of Section CC 2 (page 2-44) include information about mitigation and regulatory requirements: "Identify, recognize, and protect significant archaeological resources, and implement measures to preserve such resources prior to the implementation of projects in accordance with the California Environmental Quality Act (California Public Resources Code §21083.2 and 21084.1). Mitigate potential effects of projects on archaeological resources."
- We recommend adding two additional CCs. The first should address the treatment of Native American cultural resources per Assembly Bill 52, and the second should require a records search at the Northwest Information Center of the California Historical Resources Information System (CHRIS) at Sonoma State University before approval of a project.

Travel Demand Analysis

With the enactment of Senate Bill (SB) 743, Caltrans is focusing on transportation infrastructure that supports smart growth and efficient development. Recently approved guidance for incorporating SB 743 (*Local Development-Intergovernmental Review Program Interim Guidance, September 2016*) intends to ensure that development projects align with State policies through the use of efficient development patterns, innovative travel demand reduction strategies, and necessary multimodal roadway improvements. In Caltrans' *Smart Mobility 2010: A Call to Action for the New Decade*, this Plan falls under **Place Type 5 Rural Towns**, which includes areas with a mix of housing, services and public institutions in compact form that serve surrounding rural areas. Given this Place Type and future development planned throughout the City of Novato, please submit a travel demand analysis that provides VMT analysis resulting from the proposed Plan including:

- A vicinity map, regional location map, and site plan clearly showing the Plan's location in relation to nearby State roadways. Clearly identify State Right-of-Way (ROW), bicycle paths, and transit facilities.
- A VMT analysis pursuant to the Office of Planning and Research's Draft Guidelines. Mitigation for increasing VMT should be identified. Mitigation should support the use of

transit and active transportation modes. Potential mitigation measures that include the requirements of other agencies such as Caltrans are fully enforceable through permit conditions, agreements, or other legally-binding instruments under the control of the City of Novato.

- Evaluation of potential safety issues for all road users should be identified and fully mitigated.
- The Plan's primary and secondary effects on pedestrians, bicycles, disabled travelers and transit performance should be evaluated, including countermeasures and trade-offs resulting from mitigating VMT increases. Access to pedestrians, bicycle, and transit facilities must be maintained.

Multimodal Planning

The Plan should be conditioned to ensure connections to existing bike lanes and multi-use trails to facilitate walking and biking to nearby jobs, neighborhood services, and transit nodes such as the planned Novato San Marin Sonoma-Marin Area Rail Transit (SMART) Station. Specifically, the proposed Plan should include connections to existing and proposed bike lanes throughout the City of Novato as shown in the *2008 Marin County Unincorporated Area Bicycle and Pedestrian Master Plan*. Providing these connections with streets configured for alternative transportation modes will reduce VMT by creating multi-modal links to increase ridership of nearby Sonoma County Bus Routes and the upcoming SMART rail line.

Vehicle Trip Reduction

As the Rural Towns Place Type typically leads to high levels of VMT and corresponding low levels of active transportation, we encourage the establishment of Transportation Management Associations (TMA) in partnership with other developments in the area to pursue aggressive trip reduction targets with Lead Agency monitoring and enforcement. In addition, the TMA's should consider the following Transportation Demand Management (TDM) elements when designing projects within the City of Novato to promote smart mobility and reduce regional VMT and traffic impacts to the STN:

- Project design to encourage walking, bicycling, and convenient transit access;
- Lower parking ratios;
- Transit fare and carpool incentives for patrons, visitors, employees, and residents such as subsidized transit passes on a continuing basis;
- Enhanced bus stops including bus shelters;
- Designated bicycle parking;
- On-site showers and lockers at job centers for active transportation users;
- Designated parking spaces for carpooling;
- Charging stations and designated parking spaces for electric vehicles; and
- Reducing headway times of nearby Sonoma County Bus Routes and the upcoming SMART rail line.

For additional TDM options, please refer to Chapter 8 of FHWA's *Integrating Demand Management into the Transportation Planning Process: A Desk Reference*, regarding TDM at the local planning level. The reference is available online at: http://www.ops.fhwa.dot.gov/publications/fhwahop12035/fhwahop12035.pdf. For information about parking ratios, please see MTC's report, Reforming Parking Policies to Support Smart Growth, or visit the MTC parking webpage: http://www.mtc.ca.gov/planning/smart_growth/parking.

Traffic Impact Fees

Based on project-generated travel demand, please estimate the costs of public transportation improvements necessitated by the proposed Plan; viable funding sources such as development and/or transportation impact fees should also be identified. We encourage a sufficient allocation of fair share contributions toward multi-modal and regional transit improvements to fully mitigate cumulative impacts to regional transportation. We also strongly support measures to increase sustainable mode shares, thereby reducing VMT.

Encroachment Permit

Please be advised that any work or traffic control that encroaches onto the State ROW requires an encroachment permit that is issued by Caltrans. To apply, a completed encroachment permit application, environmental documentation, and five (5) sets of plans clearly indicating State ROW must be submitted to the following address: David Salladay, District Office Chief, Office of Permits, California Department of Transportation, District 4, P.O. Box 23660, Oakland, CA 94623-0660. Traffic-related mitigation measures should be incorporated into the construction plans prior to the encroachment permit process. See the website linked below for more information: http://www.dot.ca.gov/hq/traffops/developserv/permits.

Should you have any questions regarding this letter, please call Erik Bird at 510-286-5521 or Erik.Bird@dot.ca.gov.

Sincerely,

PATRICIA MAURICE
District Branch Chief
Local Development - Intergovernmental Review

c: State Clearinghouse

Dear Novato Planning Commission,

Greenbelt Alliance is interested in supporting a voter approved renewal of the Novato's Urban Growth Boundary before it expires in 2017 and would like to touch base with Planning Commissioners individually, if possible, before the Jan. 12 Planning Commission meeting.

We are also reaching out to Novato City Council members.

Greenbelt Alliance realizes that that City Council previously decided to renew the city's UGB with a Council vote only instead of putting it on the ballot. However, we hope that the city might reconsider given the importance and success of maintaining voter approval for UGBs in the city of Novato and around the Bay Area.

Doing so needs to be included as part of the scoping for the General Plan EIR and the election planned and budgeted for 2017.

Thanks for your consideration.

Teri Shore

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Teri Shore
Regional Director, North Bay

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Jan. 12, 2017

Planning Commission
City of Novato
922 Machin Ave.
Novato, CA 94945

Re: Item 2 Receive and consider public agency and community input on the scope and content of the EIR to be prepared for the General Plan 2035

Dear Planning Commission,

Greenbelt Alliance appreciates the opportunity to provide public comment on the scoping of the environmental review of the draft General Plan 2035 for the City of Novato. We appreciate the comprehensive public process that the city has undertaken over the past several years to develop and update the General Plan. It is a strong document that is also user friendly and provides a strong vision for city-centered growth for the next 20 years. Greenbelt Alliance is happy to support it overall.

Additionally, Greenbelt Alliance is interested in providing specific input on analysis of the renewal of the city's Urban Growth Boundary as part of the environmental review. We'd also like to provide comment on analyzing the vision and zoning for the North, North Redwood Corridor. We may provide additional comments during the environmental review and General Plan before the public process is concluded.

1. Urban Growth Boundary

In the Great Places section, Chapter 2.5, Growth Management and Development Projections, the draft General Plan states that: *Program LU 5a calls for the amendment and extension of the effective date of the Urban Growth Boundary for another 20 years.*

While we understand that the City of Novato is committed in principle to renewing the UGB for at least 20 years as stated, Program LU 5a does not in fact *call* for the extension *nor for how long*: but that: *the City Council will consider extending the term of the Urban Growth Boundary to improve the City's ability to provide municipal services and discourage urban sprawl and the provision of urban services to property outside the City limits.*

In addition, the draft General Plan does not mention that the way that the UGB is implemented or renewed change from baseline conditions and incur different environmental impacts.

If the UGB is not renewed, or if its renewal is weakened from the current voter-approved ordinance to a simple City Council approved policy, the potential environmental impacts will be different than the baseline conditions.

The environmental impacts associated with the renewal of the Urban Growth Boundary and the General Plan 2035 on the City of Novato will be vary depending on:

A. whether the UGB is renewed or not,
B. whether it is renewed by the City Council with a majority vote, (weakening existing protections),
C. whether it is renewed by the voters, (providing equivalent to existing protections),
D. whether or not the policies are changed and how, and
E. whether or not the actual boundary is changed or not.

The approach to renewing the UGB and the length of time will produce varying environmental impacts related to sprawl, city-centered growth, GHG emissions, water quality, air quality and other areas covered by the California Environmental Quality Act. Therefore we urge that the following alternatives and the associated environmental impacts be considered in the environmental review:

1. The potential, if unlikely, that the city does not renew the Urban Growth Boundary.
2. Renewal of the Urban Growth Boundary by a City Council majority vote only, thereby potentially degrading existing baseline conditions.
3. Renewal of the Urban Growth Boundary by the voters, preserving existing baseline conditions.
4. The length of the renewal of the UGB for 20 years, 30 years, 50 years or in perpetuity (with and without voter approval).
5. Proposed changes in the UGB policies and associated impacts.
6. Proposed changes in the actual boundary.
7. Impacts from the annexations that occurred since the first UGB was enacted.

Greenbelt Alliance is urging the City of Novato to consider renewing its existing Urban Growth Boundary (UGB) for 20, 30, or more years, or perhaps in perpetuity, through a vote of the people with a city-sponsored ballot measure in November 2017. By including the above options in the environmental review, the Planning Commission and the City Council will be given more flexibility in how it would like to proceed with the UGB in 2017 and beyond. Please see attached letter that was submitted to the City Council on Jan. 10, 2017.

2. North, North Redwood Corridor

The North, North Redwood Corridor contains some of the last undeveloped lands within the city of Novato and within Marin County. Greenbelt Alliance has identified these lands as among the most high-risk of development in Marin County and in the San Francisco Bay Area. We can provide more details on our analysis once our updated At Risk report is released on Jan. 31, 2017.

As stated in the draft General Plan, the corridor extends north of San Marin Drive to the City's northerly boundary with Olompali State Park and west to the slopes of Mt. Burdell. While we realize that these lands are within the City of Novato's Urban Growth Boundary and described as "vacant commercially-zoned land," we urge the Planning Commission to consider prioritizing these lands for their open space, habitat, wetlands, oak woodlands and other natural values in the environmental review of the General Plan.

We recognize that the General Plan is currently prioritizing these lands for other uses including economic development, redevelopment for office and research uses, and for retail and recreation. The Northern Novato SMART train station is also in this corridor, providing opportunities for transit-oriented development and recreation.

Given that these greenfields are adjacent to the state park and other open lands, please consider an alternative of preserving these lands for natural resource values and recreation instead of commercial development. Consider an option for this focus area that does not include additional freeway or street access, but is primarily bicycle, pedestrian, and train access only. Doing so could provide significant environmental and economic benefits for the long term beyond the boom and bust cycles of commercial and retail development. Preserving the remaining greenbelts in the City of Novato as well as around the Bay Area and concentrating growth and development of all kinds in the city center and existing developed areas will benefit people and the environment for generations to come.

Including such an option in the environmental review is likely to help the Planning Commission, the City Council and the public in making final decisions about the future zoning and use of the North, North Redwood Corridor.

Thank you so much for your time and consideration.

Sincerely,

Teri Shore
Regional Director, North Bay
707 575 3661

January 12, 2017

Delivered By Electronic Mail
Steve Marshall
Planning & Environmental Services Manager
City of Novato
922 Machin Avenue
Novato, California 94945
smarshall@cityofnovato.org

SUBJECT: Comments | Notice of Preparation of a Draft Environmental Impact Report for the Novato General Plan 2035 Update

Steve:

Thank you for providing the Marin Local Agency Formation Commission (LAFCO) the opportunity to review and comment on the Notice of Preparation (NOP) of a Draft Environmental Impact Report (DEIR) for the Novato General Plan 2035 Update. It is expected that Marin LAFCO will serve as a responsible agency under the California Environmental Quality Act (CEQA) with respect to carrying out certain aspects of the General Plan's implementation. Most notably, this includes the potential of enacting future boundary changes involving Novato as well as other public agencies' whose service areas – such as the Novato Sanitation District – overlap the project area. Accordingly, and in step with the referenced role, Marin LAFCO offers the following comments.

- **Listing of Responsible Agencies in Project Description**
  The DEIR's project description should list all responsible agency approvals needed in implementing the document. This includes listing Marin LAFCO should the DEIR contemplate any specific sphere of influence or boundary changes directly involving Novato or other governmental agencies overlapping the project area.

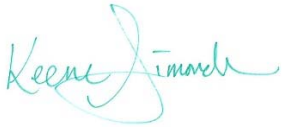
- **Incorporate and Reference as Appropriate Marin LAFCO Factors**
  Should the DEIR contemplate changes to either Novato's sphere of influence or another governmental agency the document should incorporate – as appropriate – the mandatory factors required therein for review by Marin LAFCO under Government Code Section 56425. Similarly, should the DEIR contemplate changes to either Novato's jurisdictional boundary or another governmental agency the document should incorporate – as appropriate – the mandatory factors required therein for review by Marin LAFCO under Government Code Section 56668.

Administrative Office
Keene Simonds, Executive Officer
1401 Los Gamos Drive, Suite 220
San Rafael, California 94903
T: 415-448-5877 E: staff@marinlafco.org
www.marinlafco.org

- **Defining Agricultural Land**
  Please note LAFCO law provides a distinct definition for "agricultural land" under Government Code Section 56016. This definition may be broader in application than the criteria to be used in the DEIR. To this end, please incorporate – as appropriate – into the DEIR the referenced definition under Section 56016 in step with any changes requiring approval by Marin LAFCO.

Thank you for this opportunity to comment on the NOP. Should you have any questions for Marin LAFCO please contact me by telephone at (415) 448-5877 or by e-mail at ksimonds@marinlafco.org.

Sincerely,



Keene Simonds
Executive Officer

STATE OF CALIFORNIA Edmund G. Brown Jr., Governor
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December 30, 2016

Steve Marshall
City of Novato

Sent by Email: smarshall@novato.org

RE: SCH#2016122043, Novato General Plan 2035 Update, Marin County

Dear Mr. Marshall:

The Native American Heritage Commission has received the Notice of Preparation (NOP) for the project referenced above. The California Environmental Quality Act (CEQA) (Pub. Resources Code § 21000 et seq.), specifically Public Resources Code section 21084.1, states that a project that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment. (Pub. Resources Code § 21084.1; Cal. Code Regs., tit.14, § 15064.5 (b) (CEQA Guidelines Section 15064.5 (b)). If there is substantial evidence, in light of the whole record before a lead agency, that a project may have a significant effect on the environment, an environmental impact report (EIR) shall be prepared. (Pub. Resources Code § 21080 (d); Cal. Code Regs., tit. 14, § 15064 subd.(a)(1) (CEQA Guidelines § 15064 (a)(1)). In order to determine whether a project will cause a substantial adverse change in the significance of a historical resource, a lead agency will need to determine whether there are historical resources with the area of project effect (APE).

CEQA was amended significantly in 2014. Assembly Bill 52 (Gatto, Chapter 532, Statutes of 2014) (AB 52) amended CEQA to create a separate category of cultural resources, "tribal cultural resources" (Pub. Resources Code § 21074) and provides that a project with an effect that may cause a substantial adverse change in the significance of a tribal cultural resource is a project that may have a significant effect on the environment. (Pub. Resources Code § 21084.2). Public agencies shall, when feasible, avoid damaging effects to any tribal cultural resource. (Pub. Resources Code § 21084.3 (a)). **AB 52 applies to any project for which a notice of preparation or a notice of negative declaration or mitigated negative declaration is filed on or after July 1, 2015.** If your project involves the adoption of or amendment to a general plan or a specific plan, or the designation or proposed designation of open space, on or after March 1, 2005, it may also be subject to Senate Bill 18 (Burton, Chapter 905, Statutes of 2004) (SB 18). **Both SB 18 and AB 52 have tribal consultation requirements**. If your project is also subject to the federal National Environmental Policy Act (42 U.S.C. § 4321 et seq.) (NEPA), the tribal consultation requirements of Section 106 of the National Historic Preservation Act of 1966 (154 U.S.C. 300101, 36 C.F.R. § 800 et seq.) may also apply.

The NAHC recommends consultation with California Native American tribes that are traditionally and culturally affiliated with the geographic area of your proposed project as early as possible in order to avoid inadvertent discoveries of Native American human remains and best protect tribal cultural resources. Below is a brief summary of portions of AB 52 and SB 18 as well as the NAHC's recommendations for conducting cultural resources assessments. **Consult your legal counsel about compliance with AB 52 and SB 18 as well as compliance with any other applicable laws**.

AB 52

AB 52 has added to CEQA the additional requirements listed below, along with many other requirements:

1. Fourteen Day Period to Provide Notice of Completion of an Application/Decision to Undertake a Project: Within fourteen (14) days of determining that an application for a project is complete or of a decision by a public

agency to undertake a project, a lead agency shall provide formal notification to a designated contact of, or tribal representative of, traditionally and culturally affiliated California Native American tribes that have requested notice, to be accomplished by at least one written notice that includes:

a. A brief description of the project.
b. The lead agency contact information.
c. Notification that the California Native American tribe has 30 days to request consultation. (Pub. Resources Code § 21080.3.1 (d)).
d. A "California Native American tribe" is defined as a Native American tribe located in California that is on the contact list maintained by the NAHC for the purposes of Chapter 905 of Statutes of 2004 (SB 18). (Pub. Resources Code § 21073).

2. Begin Consultation Within 30 Days of Receiving a Tribe's Request for Consultation and Before Releasing a Negative Declaration, Mitigated Negative Declaration, or Environmental Impact Report: A lead agency shall begin the consultation process within 30 days of receiving a request for consultation from a California Native American tribe that is traditionally and culturally affiliated with the geographic area of the proposed project. (Pub. Resources Code § 21080.3.1, subds. (d) and (e)) and prior to the release of a negative declaration, mitigated negative declaration or environmental impact report. (Pub. Resources Code § 21080.3.1(b)).
   a. For purposes of AB 52, "consultation shall have the same meaning as provided in Gov. Code § 65352.4 (SB 18). (Pub. Resources Code § 21080.3.1 (b)).

3. Mandatory Topics of Consultation If Requested by a Tribe: The following topics of consultation, if a tribe requests to discuss them, are mandatory topics of consultation:
   a. Alternatives to the project.
   b. Recommended mitigation measures.
   c. Significant effects. (Pub. Resources Code § 21080.3.2 (a)).

4. Discretionary Topics of Consultation: The following topics are discretionary topics of consultation:
   a. Type of environmental review necessary.
   b. Significance of the tribal cultural resources.
   c. Significance of the project's impacts on tribal cultural resources.
   d. If necessary, project alternatives or appropriate measures for preservation or mitigation that the tribe may recommend to the lead agency. (Pub. Resources Code § 21080.3.2 (a)).

5. Confidentiality of Information Submitted by a Tribe During the Environmental Review Process: With some exceptions, any information, including but not limited to, the location, description, and use of tribal cultural resources submitted by a California Native American tribe during the environmental review process shall not be included in the environmental document or otherwise disclosed by the lead agency or any other public agency to the public, consistent with Government Code sections 6254 (r) and 6254.10. Any information submitted by a California Native American tribe during the consultation or environmental review process shall be published in a confidential appendix to the environmental document unless the tribe that provided the information consents, in writing, to the disclosure of some or all of the information to the public. (Pub. Resources Code § 21082.3 (c)(1)).

6. Discussion of Impacts to Tribal Cultural Resources in the Environmental Document: If a project may have a significant impact on a tribal cultural resource, the lead agency's environmental document shall discuss both of the following:
   a. Whether the proposed project has a significant impact on an identified tribal cultural resource.
   b. Whether feasible alternatives or mitigation measures, including those measures that may be agreed to pursuant to Public Resources Code section 21082.3, subdivision (a), avoid or substantially lessen the impact on the identified tribal cultural resource. (Pub. Resources Code § 21082.3 (b)).

7. Conclusion of Consultation: Consultation with a tribe shall be considered concluded when either of the following occurs:
   a. The parties agree to measures to mitigate or avoid a significant effect, if a significant effect exists, on a tribal cultural resource; or
   b. A party, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached. (Pub. Resources Code § 21080.3.2 (b)).

8. Recommending Mitigation Measures Agreed Upon in Consultation in the Environmental Document: Any mitigation measures agreed upon in the consultation conducted pursuant to Public Resources Code section 21080.3.2 shall be recommended for inclusion in the environmental document and in an adopted mitigation monitoring and reporting program, if determined to avoid or lessen the impact pursuant to Public Resources Code section 21082.3, subdivision (b), paragraph 2, and shall be fully enforceable. (Pub. Resources Code § 21082.3 (a)).

9. Required Consideration of Feasible Mitigation: If mitigation measures recommended by the staff of the lead agency as a result of the consultation process are not included in the environmental document or if there are no agreed upon mitigation measures at the conclusion of consultation, or if consultation does not occur, and if substantial evidence demonstrates that a project will cause a significant effect to a tribal cultural resource, the lead agency shall consider feasible mitigation pursuant to Public Resources Code section 21084.3 (b). (Pub. Resources Code § 21082.3 (e)).

10. Examples of Mitigation Measures That, If Feasible, May Be Considered to Avoid or Minimize Significant Adverse Impacts to Tribal Cultural Resources:
    a. Avoidance and preservation of the resources in place, including, but not limited to:
        i. Planning and construction to avoid the resources and protect the cultural and natural context.
        ii. Planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria.
    b. Treating the resource with culturally appropriate dignity, taking into account the tribal cultural values and meaning of the resource, including, but not limited to, the following:
        i. Protecting the cultural character and integrity of the resource.
        ii. Protecting the traditional use of the resource.
        iii. Protecting the confidentiality of the resource.
    c. Permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or utilizing the resources or places.
    d. Protecting the resource. (Pub. Resource Code § 21084.3 (b)).
    e. Please note that a federally recognized California Native American tribe or a nonfederally recognized California Native American tribe that is on the contact list maintained by the NAHC to protect a California prehistoric, archaeological, cultural, spiritual, or ceremonial place may acquire and hold conservation easements if the conservation easement is voluntarily conveyed. (Civ. Code § 815.3 (c)).
    f. Please note that it is the policy of the state that Native American remains and associated grave artifacts shall be repatriated. (Pub. Resources Code § 5097.991).

11. Prerequisites for Certifying an Environmental Impact Report or Adopting a Mitigated Negative Declaration or Negative Declaration with a Significant Impact on an Identified Tribal Cultural Resource: An environmental impact report may not be certified, nor may a mitigated negative declaration or a negative declaration be adopted unless one of the following occurs:
    a. The consultation process between the tribes and the lead agency has occurred as provided in Public Resources Code sections 21080.3.1 and 21080.3.2 and concluded pursuant to Public Resources Code section 21080.3.2.
    b. The tribe that requested consultation failed to provide comments to the lead agency or otherwise failed to engage in the consultation process.
    c. The lead agency provided notice of the project to the tribe in compliance with Public Resources Code section 21080.3.1 (d) and the tribe failed to request consultation within 30 days. (Pub. Resources Code § 21082.3 (d)).

The NAHC's PowerPoint presentation titled, "Tribal Consultation Under AB 52: Requirements and Best Practices" may be found online at: http://nahc.ca.gov/wp-content/uploads/2015/10/AB52TribalConsultation_CalEPAPDF.pdf

SB 18

SB 18 applies to local governments and requires local governments to contact, provide notice to, refer plans to, and consult with tribes prior to the adoption or amendment of a general plan or a specific plan, or the designation of open space. (Gov. Code § 65352.3). Local governments should consult the Governor's Office of Planning and Research's "Tribal Consultation Guidelines," which can be found online at: https://www.opr.ca.gov/docs/09_14_05_Updated_Guidelines_922.pdf

Some of SB 18's provisions include:

1. Tribal Consultation: If a local government considers a proposal to adopt or amend a general plan or a specific plan, or to designate open space it is required to contact the appropriate tribes identified by the NAHC by requesting a "Tribal Consultation List." If a tribe, once contacted, requests consultation the local government must consult with the tribe on the plan proposal. **A tribe has 90 days from the date of receipt of notification to request consultation unless a shorter timeframe has been agreed to by the tribe.** (Gov. Code § 65352.3 (a)(2)).
2. No Statutory Time Limit on SB 18 Tribal Consultation. There is no statutory time limit on SB 18 tribal consultation.
3. Confidentiality: Consistent with the guidelines developed and adopted by the Office of Planning and Research pursuant to Gov. Code section 65040.2, the city or county shall protect the confidentiality of the information concerning the specific identity, location, character, and use of places, features and objects described in Public Resources Code sections 5097.9 and 5097.993 that are within the city's or county's jurisdiction. (Gov. Code § 65352.3 (b)).
4. Conclusion of SB 18 Tribal Consultation: Consultation should be concluded at the point in which:
    a. The parties to the consultation come to a mutual agreement concerning the appropriate measures for preservation or mitigation; or
    b. Either the local government or the tribe, acting in good faith and after reasonable effort, concludes that mutual agreement cannot be reached concerning the appropriate measures of preservation or mitigation. (Tribal Consultation Guidelines, Governor's Office of Planning and Research (2005) at p. 18).

Agencies should be aware that neither AB 52 nor SB 18 precludes agencies from initiating tribal consultation with tribes that are traditionally and culturally affiliated with their jurisdictions before the timeframes provided in AB 52 and SB 18. For that reason, we urge you to continue to request Native American Tribal Contact Lists and "Sacred Lands File" searches from the NAHC. The request forms can be found online at: http://nahc.ca.gov/resources/forms/

NAHC Recommendations for Cultural Resources Assessments

To adequately assess the existence and significance of tribal cultural resources and plan for avoidance, preservation in place, or barring both, mitigation of project-related impacts to tribal cultural resources, the NAHC recommends the following actions:

1. Contact the appropriate regional California Historical Research Information System (CHRIS) Center (http://ohp.parks.ca.gov/?page_id=1068) for an archaeological records search. The records search will determine:
    a. If part or all of the APE has been previously surveyed for cultural resources.
    b. If any known cultural resources have been already been recorded on or adjacent to the APE.
    c. If the probability is low, moderate, or high that cultural resources are located in the APE.
    d. If a survey is required to determine whether previously unrecorded cultural resources are present.

2. If an archaeological inventory survey is required, the final stage is the preparation of a professional report detailing the findings and recommendations of the records search and field survey.
    a. The final report containing site forms, site significance, and mitigation measures should be submitted immediately to the planning department. All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum and not be made available for public disclosure.
    b. The final written report should be submitted within 3 months after work has been completed to the appropriate regional CHRIS center.

3. Contact the NAHC for:
    a. A Sacred Lands File search. Remember that tribes do not always record their sacred sites in the Sacred Lands File, nor are they required to do so. A Sacred Lands File search is not a substitute for consultation with tribes that are traditionally and culturally affiliated with the geographic area of the project's APE.

b. A Native American Tribal Consultation List of appropriate tribes for consultation concerning the project site and to assist in planning for avoidance, preservation in place, or, failing both, mitigation measures.

4. Remember that the lack of surface evidence of archaeological resources (including tribal cultural resources) does not preclude their subsurface existence.
   a. Lead agencies should include in their mitigation and monitoring reporting program plan provisions for the identification and evaluation of inadvertently discovered archaeological resources per Cal. Code Regs., tit. 14, section 15064.5(f) (CEQA Guidelines section 15064.5(f)). In areas of identified archaeological sensitivity, a certified archaeologist and a culturally affiliated Native American with knowledge of cultural resources should monitor all ground-disturbing activities.
   b. Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the disposition of recovered cultural items that are not burial associated in consultation with culturally affiliated Native Americans.
   c. Lead agencies should include in their mitigation and monitoring reporting program plans provisions for the treatment and disposition of inadvertently discovered Native American human remains. Health and Safety Code section 7050.5, Public Resources Code section 5097.98, and Cal. Code Regs., tit. 14, section 15064.5, subdivisions (d) and (e) (CEQA Guidelines section 15064.5, subds. (d) and (e)) address the processes to be followed in the event of an inadvertent discovery of any Native American human remains and associated grave goods in a location other than a dedicated cemetery.

If you have any questions, please contact me at my email address: sharaya.souza@nahc.ca.gov.

Sincerely,

Sharaya Souza
Staff Services Analyst
cc: State Clearinghouse

Steve,
Thank you for the NOP distribution notice.
TAM as the Congestion Management Agency of Marin county prepares a biannual congestion management plan for Marin, that monitors the performance of roadway segments including portions of Novato Boulevard, Bel Marin Keys, US 101 and Highway 37. Under current CEQA guidelines, the general plan should assess current and future impacts to the performance of these roadways identified in the congestion management plan. TAM would appreciate the opportunity to work with the city of Novato to develop the methodology for conducting this analysis, and for assessing the impacts resulting from GP build out.
Furthermore, as final guidance on SB 743 is made available and coordinating agencies modify their impact assessments, TAM would like to continue to work with the city of Novato to maintain and assess performance of the local CMP roadway system.
Thank you and please let me know if you have any questions or comments.

Derek McGill, AICP
Planning Manager
Transportation Authority of Marin
dmcgill@tam.ca.gov
(415) 226-0825
900 5th Avenue, Suite 100
San Rafael, CA 94901

From: Steve Marshall [mailto:smarshall@novato.org]
Sent: Monday, December 19, 2016 2:16 PM
To: Bill Tyler; dmcintyre@nmwd.com; erikb@novatosan.com; TWilliams@marincounty.org; jhogeboom@nusd.org; yhawkins@nusd.org; phils@msmosquito.com; rrojas@marincounty.org; bcrawford@marincounty.org; lgradia@marintransit.org; rdowning@goldengate.org; Derek McGill; bgamlen@sonomamarintrain.org; bmcquillen@gratonrancheria.com; THPO@gratonrancheria.com; jada@pge.com; KSimonds@marinlafco.org; ncamargo@bmkcsd.us; nancy@marinrcd.org; dweisz@mcecleanenergy.org; michael@michaelsfrank.com; mkorten@marincounty.org; rdoyle@marinsheriff.org; Paul.Jensen@cityofsanrafael.org
Cc: Matthew Maddox; Bob Brown; Christine O'Rourke
Subject: Draft Novato General Plan 2035 - Notice of Preparation of Environmental Impact Report

Dear Agency Staff:

The attached Notice of Preparation (NOP) has been issued to notify interested parties of the preparation of an environmental impact report (EIR) for the Novato General Plan 2035 (General Plan update). The City of Novato will be the lead agency under the California Environmental Quality Act (CEQA) and will prepare a programmatic Environmental Impact Report (Program EIR) to evaluate the environmental effects associated with the General Plan update.

In accordance with the time limits identified in state law, your response to this NOP must be submitted to the City at the earliest possible date, but not later than 5:00 p.m. on January 19, 2017 (32 days following the date this notice was first posted). In addition, a public scoping meeting will be conducted on Thursday, January 12, 2017, at 7:00 pm as part of the regularly scheduled Planning Commission hearing which will be held at: Novato City Hall, 901 Sherman

Avenue, Novato, California 94945. This NOP, the Draft General Plan 2035 update, and background documents are available for review on the City's General Plan Update webpage at: http://novato.org/government/community-development/general-plan-update

Sincerely,

Steve Marshall, AICP
Planning & Environmental Services Manager

City of Novato
Community Development Department
922 Machin Avenue
Novato, CA 94945

Main: (415)899-8989
Direct: (415)899-8942
Fax: (415)899-8216

www.novato.org

Appendix B

General Plan 2035 Implementing Ordinances

General Plan Land Use Map and Zoning Map Revisions

Description	Policy Implications
1. General Plan land use map and zoning map change for 15 parcels on both sides of Redwood Boulevard between Vallejo Avenue and Pinheiro Circle from General Commercial (CG) to Downtown Core (CD) with Downtown Core Business (CDB) as the implementing zoning district.	Changes in allowable uses: precludes auto uses (several become non-conforming) and allows residential mixed use development. Increases maximum FAR from 0.4 to 2.0 (with potential to include housing in a mixed-use project). Increases maximum height limit from 42-feet to 45-feet.
2. General Plan land use map and zoning map change for 7 parcels on the east side of Redwood Boulevard between Olive Avenue and Rush Creek Place from Commercial Industrial (CI) to General Commercial (CG).	Changes allowable land uses from industrial activities to retail. Decreases FAR from 1.0 to 0.4, with exception of hotels assigned an FAR of 0.7.
3. General Plan land use map change for 5 parcels on the west side of Redwood Boulevard between San Marin Drive and the Novato city limits from Light Industrial Office (LIO) to Business and Professional Office (BPO).	Changes allowable land uses from industrial activities to offices.
4. General Plan land use map and zoning map change for a property owned by North Marin Water District located off of Reservoir Drive and Oleander Lane (APN 153-111-15) from Business and Professional Office (BPO) to Very Low Density Residential (RVL) and application of Planned District (PD) zoning.	Projected development potential of one (1) single-family residence due to hillside constraints.
5. Rezone two parcels owned by North Marin Water District located off of Spinosa Way (APNs: 141-110-06 & 07) from Community Facilities (CF) to Low Density Residential (R1) with a minimum lot size of 40,000 sq. ft. (R1-40).	Parcels are assigned Low Density Residential (R1) land use designation. Rezone would correct inconsistency between land use designation and zoning classification. Projected development potential of one (1) single-family residence due to hillside constraints.

6. General Plan land use map and zoning map change for 12 parcels on Clayton Court from Medium Density Multiple Family Residential (R10) to Low Density Residential (R1) and R10-4.5 zoning to R1-7.5 zoning.	Places existing single-family homes in a single-family land use category and zoning district.
7. General Plan land use map and zoning map change for 12 parcels on the west side of First Street between Vallejo Avenue and Olive Avenue from Mixed Use (MU) to Medium Density Multiple Family (R10) and Mixed Use (MU) zoning to R10-2.2 zoning.	Sites currently developed with multi-family uses. Change would eliminate the requirement for commercial uses when redevelopment occurs.
8. Rezone 200 parcels in the Northwest Quad from R10-4.5 to R10-NWQ (new form-based zoning district).	Retains existing General Plan land use designation and density allowing up to 20 du/acre. However, rescinds previous zoning limitation requiring retention of existing single-family homes. New zoning is projected to increase redevelopment by 10 multi-family units by 2035.
9. Change boundary of Downtown Overlay on General Plan Land Use Map and Zoning Map to remove three parcels from the Overlay, including APNs 153-390-01, 153-091-10, and 153-121-03.	Parcels will be regulated by standard Mixed-Use (MU) zoning.
10. General Plan land use map and zoning map change for 2 parcels in Bahia (APNs 143-151-20 and 153-151-24) from Low Density Residential (R1) and Planned District (PD) zoning to the Conservation (CON) land use designation and zoning classification.	These parcels are owned by the Marin County Open Space District and Marin Audubon and are held for conservation. Accordingly, a residential land use designation is no longer appropriate. This action reduces the development potential of these properties.
11. Change GP Land Use Map for 3 parcels at Hamilton from Multi-Family to Open Space (APNs 155-500-66; 157-180-53; 157-180-72) and one parcel from Single Family and Multi-Family to Community Facilities (157-860-04).	Reduces development potential of publically owned property.
12. General Plan land use map and zoning map change for 5 parcels (APNs 155-400-01, -02, -04, -06, and -07) south of Marin Valley Mobile Country Club from Low Density Residential (R1) to Open Space (OS).	Property acquired by the City of Novato for open space.

General Plan Implementing Ordinances

Ordinance Description
1. Modify Novato Industrial Park Master Plan and Precise Development Plan to: a. Allow ancillary retail sale of products made or commonly wholesaled on-site; up to 10% of total floor area may be devoted to retail sales and display area. b. Allow existing non-conforming recreational uses to expand provided other zoning requirements (e.g., parking) are met. c. Modify the auto related uses conditionally permitted in the Bel Marin Commerce Park and Ignacio Industrial Park areas to allow commercial auto restoration. d. Create an allowance for life science/biotech campuses comprised of proximate, related properties with approval of a use permit and offering an allowable increase in maximum FAR from 0.6 to 1.2 (up to maximum net increase of 500,00 sq. ft. of additional floor area above an FAR of 0.6) and an increase in building height from a maximum of 42 feet to 68 feet (plus allowance for 8' additional height for mechanical equipment screening of up to 10% of roof area).
2. Modify Hillside/Ridgeline Ordinance (Municipal Code Division 19.26) to clarify development standards (e.g., height, maximum home size, and home placement) for lots created prior to January 13, 2004.
3. Modify Downtown Core Retail (CDR) and Downtown Core Business (CDB) zoning regulations (Novato Municipal Code Section 19.12.030) to eliminate tobacco product shops as an allowed use in these zoning districts.
4. Modify General Commercial (CG) zoning regulations (Novato Municipal Code Section 19.12.030) to allow tobacco product shops as a conditionally permitted use.
5. Modify Downtown Overlay Zoning District (Novato Municipal Code Section 19.14.040) to: a. Eliminate reference to compliance with design guidelines as being mandatory. b. Eliminate references to Downtown Specific Plan.
6. Modify procedures and findings in Novato Municipal Code 19.56.070.B for granting amendments to the Urban Growth Boundary due to threats to public health and safety based on voter approval of Measure D on November 7, 2017.

7. Modify Municipal Code Section 19.20.030 to prohibit gated communities consistent with 1996 General Plan Community Identity Policy 1A.
8. Modify woodland tree removal mitigation requirements (Novato Municipal Code Section 19.39.040.G) to prioritize replacement planting of native species and to consider requiring fewer, but larger replacement trees based on site conditions.
9. Modify animal keeping regulations (Novato Municipal Code Section 19.34.060) to allow beekeeping in all residential zoning districts, subject to performance standards limiting number of hives based on site area (min. 2 hives), orientation of entrance, setbacks, maintenance and on-site water source.
10. Modify parking lot landscape requirements (Novato Municipal Code Section 19.30.70.H) to increase the minimum interior parking lot tree well dimension from 4-feet to 6-feet (exempting parking lots in the Downtown area and the renovation of existing parking lots) and requiring on-site monitoring and certification by a landscape architect of interior parking lot tree installation to verify maximum soil compaction of 75% and proper soil amendments. Adopt a list of recommended 20'+ canopy shade trees for parking lot interiors. Allow deviation from parking lot design standards through Design Review.
11. Amend the Wetland Protection and Restoration Ordinance (Novato Municipal Code Section 19.36.070.A) to include the protection of special status species as a reason to require an expanded wetland buffer area.
12. Modify Tables 2-8 and 2-10 of Novato Municipal Code Sections 19.12.040 and 19.14.040 to allow hotels to have a maximum FAR of 0.7 (increased from 0.4) in LIO, BPO, MU, CN and CG zoning districts.
13. Modify lighting performance standards (Novato Municipal Code Section 19.22.060) to eliminate 11 PM curfew on non-essential interior and exterior lighting, and call for Dark Sky certified exterior lighting fixtures in new development subject to Design Review.
14. Add new solar facility permitting section to the Novato Municipal Code allowing commercial solar panels, solar carports, and ground-mounted solar installations in specified zoning districts, subject to height and size limits, setbacks and performance standards.
15. Allow community gardens as a permitted use in all zoning districts. Allow market gardens (small commercial garden) as a conditional use in all residential zoning districts. Limited on-site retail sales allowed for both garden types.

Appendix C

Sensitive Species Inventory Tables

Table 1 Special-Status Wildlife Species with the Potential to Occur in the Novato Vicinity and Nine USGS Quadrangles

Common Name	Scientific Name	Agency Status (Federal/State /Other)	Habitat Requirements
Reptiles			
Western pond turtle	*Emys marmorata*	--/--/SSC	Streams/ponds/lakes
Amphibians			
California giant salamander	*Dicamptodon ensatus*	--/--/SSC	Meadow and seep
California red-legged frog	*Rana draytonii*	**FT**/--/SSC	Semi-permanent or permanent water at least 2 feet deep, bordered by emergent or riparian vegetation, and upland grassland, forest or scrub habitats for refugia and dispersal.
California tiger salamander	*Ambystoma califomiense*	**FT**/**ST**/---	Vernal pools, grasslands, oak savanna, woodland, and coastal scrub. Needs underground refuges.
Foothill yellow-legged frog	*Rana boylii*	--/--/SSC	Partly-shaded, shallow streams and riffles with a rocky substrate in a variety of habitats. Need at least some cobble-sized substrate for egg-laying
Red-bellied newt	*Taricha rivularis*	--/--/SSC	Broadleaved upland forest, north coast coniferous forest, redwood, riparian forest and woodland
Invertebrates			
California freshwater shrimp	*Syncaris pacifica*	**FE**/**SE**/--	Freshwater streams and undercut banks
San Bruno elfin butterfly	*Callophrys mossii bayensis*	**FE**/--/--	Grassland
Fish			
Coho salmon-central California Coast	*Oncorhynchus kisutch*	**FE**/**SE**/--	Spawns in freshwater
Eulachon	*Thaleichthys pacificus*	**FT**/--/--	Coast flowing waters
Longfin smelt	*Spirinchus thaleichthys*	--/**ST**/SSC	Aquatic, estuary
Sacramento splittail	*Pogonichthys macrolepidotus*	--/--/SSC	Estuary, freshwater, marsh
Steelhead-central California coast	*Oncorhynchus mykiss irideus*	**FT**/--/--	Inhabits fresh water, fast flowing, highly oxygenated, clear, cool stream where riffles tend to predominate pools; small streams with high elevation headwaters close to the ocean that have no impassible barriers; spawning: high elevation headwaters.
Tidewater goby	*Eucyclogobis newberryi*	**FE**/--/SSC	Brackish water, marsh/bay
Tomales roach	*Lavinia symmetricus* spp.	--/--/SSC	Aquatic, flowing waters
Birds			
Alameda song sparrow	*Melospiza melodia pusillua*	--/--/SSC	Salt marsh
Bank Swallow	*Riparia riparia*	--/**ST**/--	Riparian scrub and riparian woodland

Common Name	Scientific Name	Agency Status (Federal/State /Other)	Habitat Requirements
Black swift	*Cypseloides niger*	--/--/SSC	Damp forest
Burrowing owl	*Athene cunicularia*	--/--/SSC	Burrow sites in open dry annual or perennial grasslands, deserts and scrublands characterized by low growing vegetation. Also inhabits anthropogenic habitats such as campuses, golf courses, cemeteries, airports, and grazed pastures.
California Black Rail	*Laterallus jamaicensis cotumiculus*	--/**ST**/FP	Brackish marsh, freshwater marsh, salt marsh, and wetland
California Clapper Rail	*Rallus longirostris obsoletus*	**FE**/**SE**/--	Slat and brackish marsh
California Ridegeway's rail	*Rallus obsoletus obsoletus*	**FE**/**SE**/**FP**	Brackish marsh, salt marsh, wetland
Northern harrier	*Circus cyaneus*	--/--/SSC	Nests in marsh and low shrubs
Northern spotted owl	*Strix occidentalis caurina*	**FT**/**ST**/--	Forests with dense canopy closure of mature and old-growth trees, abundant logs, standing snags, and live trees with broken tops
Saltmarsh common yellowthroat	*Geothlypis trichas sinuosa*	--/--/SSC	Slat and brackish water marsh
San Pablo song sparrow	*Melospiza melodia samuelis*	--/--/SSC	Coastal saltmarsh and brackish marsh
Short-eared owl	*Asio flammeus*	--/--/SSC	Grasslands and marsh
Swainson's hawk	*Buteo swainsoni*	--/**ST**/--	Breeds in grasslands with scattered trees, juniper-sage flats, riparian areas, savannahs, and agricultural or ranch lands. Requires adjacent suitable foraging areas such as grasslands, or alfalfa or grain fields that support rodent populations.
Tricolored blackbird	*Agelaius tricolor*	--/CE/SSC	Open water, protected nesting substrate, and foraging area with insect prey within a few miles of the colony.
Western snowy plover	*Charadrius alexandrines nivosus*	**FT**/--/SSC	Standing water, sand shore, and wetlands
White-tailed kite	*Elanus leucurus*	--/FP/--	Nests in grassland and marshland with trees
Mammals			
American badger	*Taxidea taxus*	--/--/SSC	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats with friable soils. Needs sufficient food, friable soils, and open uncultivated ground. Cannot live in frequently plowed fields. Preys on burrowing rodents.
Pallid bat	*Antrozous pallidus*	--/--/SSC	Rocky canyons, open farmland, scattered desert scrub, grassland, shrubland, woodland, and mixed conifer forest. Roosts in caves, crevices, and trees; forages in a variety of habitats.
Point Reyes mountain beaver	*Aplodontia rufa phaea*	--/--/SSC	Coastal scrub, meadows, seeps

Common Name	Scientific Name	Agency Status (Federal/State /Other)	Habitat Requirements
Salt-marsh harvest mouse	*Reithrodontomys raviventris*	**FE**/**SE**/FP	Marsh, swamp, wetland

Common Name	Scientific Name	Agency Status (Federal/State /Other)	Habitat Requirements
Salt-marsh wandering shrew	*Sorex vagrans halicoetes*	--/--/SSC	Marsh and swamp, wetland
San Pablo vole	*Microtus californicus sanpabloensis*	--/--/SSC	Marsh, swamp, grassland, wetland
Suisun shrew	*Sorex omatus sinuosus*	--/--/SSC	Marsh, swamp, wetland
Townsend's big-eared bat	*Corynorhinus townsendii*	--/--/SSC	Mesic habitats throughout California. Requires caves, tunnels, mines, or abandon buildings for roosting
Western red bad	*Lasiurus blossevillii*	--/--/SSC	Roosts in forests and woodlands. Feeds over grasslands, shrublands, open woodlands, and agricultural crops

FE=Federally Endangered
FT=Federally Threatened
FC=Federal Candidate
DL=Federal Delisted

SE=State Endangered
ST=State Threatened
CFP=California Fully Protected
CSC=California Species of Concern

FP = CDFW fully protected
SSC = CDFW species of special concern
Rare = Rare species, State ranking as rare
MMPA=Marine Mammal Protection Act

Source: California Natural Diversity Database (CNDDB) (USGS 7.5-minute Novato and eight surrounding quadrangles), April 2018

Table 2 Special-Status Plants with the Potential to Occur in the Novato Vicinity and Nine USGS Quadrangles

Common Name	Scientific Name	Agency Status (Federal/State/ CRPR/Other)	Habitat Requirements
Franciscan onion	*Allium peninsulare var. franciscanum*	--/--/1B.2	Woodland/grassland
Sonoma alopecurus	*Alopecurus aequalis* var. *sonomensis*	**FE**/--/1B.1	Freshwater marsh/riparian scrub
Napa false indigo	*Amorpha californica var. napensis*	--/--/1B.2	Forest/chaparral/woodland
Bent-flowered fiddleneck	*Amsinckia lunaris*	--/--/1B.2	Coastal bluff scrub/woodland/grassland
Coast rockcress	*Arabis blepharophylla*	--/--/4.3	Broadleafed upland forest and coastal bluff scrub/prairie/scrub
Mt. Tamalpais manzanita	*Arctostaphylos montana ssp. montana*	--**/**--/1B.3	Chaparral/grassland
Marin manzanita	*Arctostaphylos virgata*	--/--/1B.2	Forest/chaparral
Carlotta Hall's lace fern	*Aspidotis carlotta-halliae*	--/--/4.2	Chaparral/cismontane woodland
Brewer's milk-vetch	*Astragalus breweri*	--/--/4.2	Chaparral/cismontane woodland/meadows and seeps/grassland
Coastal marsh milk-vetch	*Astragalus pycnostachyus* var.	--/--/1B.2	Coastal scrub/dunes/marsh/swamps

Common Name	Scientific Name	Agency Status (Federal/State/ CRPR/Other)	Habitat Requirements
	pycnostachyus		
Alkali milk-vetch	*Astragalus tener* var. *tener*	--/--/1B.2	Vernal pools/grassland/playas
Sonoma sunshine	*Blennosperma bakeri*	**FE**/**SE**/1B.1	Vernal pools/mesic grassland
Thurber's reed grass	*Calamagrostis crassiglumis*	--/--/2B.1	Coastal scrub/marshes/swamps
Serpentine reed grass	*Calamagrostis ophitidis*	--/--/4.3	Serpentine/chaparral/meadows/seeps/grasslan d
Brewer's calandrinia	*Calandrinia breweri*	--/--/4.2	Chaparral/coastal scrub
Tiburon mariposa lily	*Calochortus tiburonensis*	**FT**/**ST**/1B.1	Serpentine grassland
Oakland star-tulip	*Calochortus umbellatus*	--/--/4.2	Chaparral/forest/cismontane woodland/grassland
Seaside bittercress	*Cardamine angulata*	--**/**--/2B.1	Forests
Lyngbye's sedge	*Carex lyngbyei*	--/--/2B.2	Marshes/swamps
Tiburon paintbrush	*Castilleja affinis* var. *neglecta*	**FE**/**ST**/1B.2	Serpentine grassland
Johnny-nip	*Castilleja ambigua* var. *ambigua*	--/--/4.2	Coastal bluff/prairie/scrub and marshes/swamps/grassland/vernal pools
Nicasio ceanothus	*Ceanothus decornutus*	--/--/1B.2	Chaparral
Glory brush	*Ceanothus gloriosus* var. *exaltatus*	--/--/4.3	Chaparral
Point Reyes ceanothus	*Ceanothus gloriosus* var. *gloriosus*	--/--/4.3	Coastal bluff/dunes/scrub and forest
Mason's ceanothus	*Ceanothus masonii*	--/--/1B.2	Chaparral/serpentine
Kern ceanothus	*Ceanothus pinetorum*	--/--/4.3	Forest
Monterey ceanothus	*Ceanothus rigidus*	--/--/4.2	Chaparral/forest/coastal scrub
Pappose tarplant	*Centromadia parryi* ssp. *parryi*	--/--/1B.2	Chaparral/mesic grassland/marshes/coastal prairie
Point Reyes salty bird's-beak	*Chloropyron maritimum* ssp. *palustre*	--/--/1B.2	Marshes/swamps
Soft salty bird's-beak	*Chloropyron molle* ssp. *molle*	**FE/**--/1B.2	Marshes/swamps
San Francisco Bay spineflower	*Chorizanthe cuspidata* var. *cuspidata*	--/--/1B.2	Coastal scrub/prairie/dunes
Sonoma spineflower	*Chorizanthe valida*	**FE**/**SE**/1B.1	Coastal prairie
Mt. Tamalpais thistle	*Cirsium hydrophilum* var.	--/--/1B.2	Forest/chaparral

Common Name	Scientific Name	Agency Status (Federal/State/ CRPR/Other)	Habitat Requirements
	vaseyi		
Seaside cistanthe	*Cistanthe maritima*	--/--/4.2	Coastal bluff scrub/scrub and grassland

Common Name	Scientific Name	Agency Status (Federal/State/ CRPR/Other)	Habitat Requirements
Round-headed Chinese-houses	*Collinsia corymbosa*	--/--/1B.2	Coastal dunes
California lady's-slipper	*Cypripedium californicum*	--/--/4.2	
Baker's larkspur	*Delphinium bakeri*	**FE**/**SE**/1B.1	Coastal scrub
Golden larkspur	*Delphinium luteum*	**FE**/--/1B.1	Chaparral, coastal prairie, coastal scrub
Western leatherwood	*Dirca occidentalis*	--**/**--/1B.2	Forest/chaparral/woodland
Dwarf downingia	*Downingia pusilla*	--/--/2B.2	Vernal pools/mesic grassland
Small spikerush	*Eleocharis parvula*	--/--/4.3	Bogs/forest
California bottle-brush grass	*Elymus californicus*	--/--/4.3	Forest/cismontane woodland/riparian woodland
Koch's cord moss	*Entosthodon kochii*	--/--/1B.2	Woodland
Streamside daisy	*Erigeron biolettii*	--/--/3	Forest/woodland
Tiburon buckwheat	*Eriogonum luteolum* var. *caninum*	--/--/1B.2	Chaparral/woodland/grassland/coastal pine
San Francisco wallflower	*Erysimum franciscanum*	--/--/4.2	Chaparral/coastal dunes/coastal scrub/grassland
Minute pocket moss	*Fissidens pauperculus*	--/--/1B.2	Forest with damp soil
Marin checker lily	*Fritillaria lanceolata* var. *tristulis*	--/--/1B.1	Coastal bluff scrub/prairie
Fragrant fritillary	*Fritillaria liliacea*	--/--/1B.2	Coastal scrub/prairie/grassland
Blue coast gilia	*Gilia capitata* ssp. *chamissonis*	--/--/1B.1	Coastal scrub/dunes
Woolly-headed gilia	*Gilia capitata* ssp. *tomentosa*	--**/**--/1B.1	Coastal bluff scrub
Dark-eyed gilia	*Gilia millefoliata*	--/--/1B.2	Coastal dunes
San Francisco gumplant	*Grindelia hirsutula* var. *maritima*	--/--/3.2	Coastal bluff scrub/coastal scrub/grassland
Diablo helianthella	*Helianthella castanea*	--/--/1B.2	Forest/chaparral/woodland/coastal scrub/grassland
Congested-headed hayfield tarplant	*Hemizonia congesta ssp. congesta*	--/--/1B.2	Grassland
Marin western flax	*Hesperolinon congestum*	**FT**/**ST**/1B.1	Chaparral/grassland
Santa Cruz tarplant	*Holocarpha macradenia*	**FT**/**SE**/1B.1	Coastal prairie/coastal scrub/grassland

Common Name	Scientific Name	Agency Status (Federal/State/ CRPR/Other)	Habitat Requirements
Thin-lobed horkelia	*Horkelia tenuiloba*	--/--/1B.2	Mesic grassland/chaparral/forest
Small groundcone	*Kopsiopsis hookeri*	--/--/2B.3	North coast coniferous forest
Contra Costa goldfields	*Lasthenia conjugens*	**FE/**--/1B.1	Vernal pools/grassland/woodland
Bristly leptosiphon	*Leptosiphon acicularis*	--/--/4.2	Chaparral/cismontane woodland/coastal prairie/grassland
Coast yellow leptosiphon	*Leptosiphon croceus*	--/--/1B.1	Coastal bluff scrub/coastal prairie
Large-flowered leptosiphon	*Leptosiphon grandiflorus*	--/--/4.2	Coastal bluff scrub/dunes/prairie/scrub and forest/cismontane woodland/grassland
Woolly-headed lessingia	*Lessingia hololeuca*	--/--/3	Forest/scrub/grassland
Tamalpais lessingia	*Lessingia micradenia* var. *micradenia*	--/--/1B.2	Chaparral/grassland
Pitkin Marsh lily	*Lilium pardalinum* ssp. *pitkinense*	**FE**/**SE**/1B.1	Cismontane woodland/meadows/seeps/marshes/swamp
Mt. Diablo cottonweed	*Micropus amphibolus*	--/--/3.2	Forest/woodland/chaparral/grassland
Marsh microseris	*Microseris paludosa*	--/--/1B.2	Forest/woodland/coastal scrub/grassland
Elongate copper moss	*Mielichhoferia elongata*	--/--/4.3	Woodland/vernally mesic rocks
Baker's navarretia	*Navarretia leucocephala* ssp. *bakeri*	--**/**--/1B.1	Woodland/seeps/pools/grassland/forest
Marin County navarretia	*Navarretia rosulata*	--/--/1B.2	Coniferous forest/chaparral
White-rayed pentachaeta	*Pentachaeta bellidiflora*	**FE**/**SE**/1B.1	Grassland on serpentine
Gairdner's yampah	*Perideridia gairdneri* ssp. *gairdneri*	--/--/4.2	Chaparral/forest/coastal prairie/grassland/vernal pools
Michael's rein orchid	*Piperia michaelii*	--/--/4.2	Coastal bluff scrub/scrub and chaparral/forest/cismontane woodland
Hairless popcornflower	*Plagiobothrys glaber*	--/--/1A	Meadows/seeps/marshes/swamps
Petaluma popcornflower	*Plagiobothrys mollis* var. *vestitus*	--/--/1A	Marshes/swamps/grassland
North Coast semaphore grass	*Pleuropogon hooverianus*	--/**ST**/1B.1	Forest/steeps

Common Name	Scientific Name	Agency Status (Federal/State/ CRPR/Other)	Habitat Requirements
Nodding semaphore grass	*Pleuropogon refractus*	--/--/4.2	Meadows/seeps/forest/riparian forest
Marin knotweed	*Polygonum marinense*	--**/**--/3.1	Marshes/swamps
Tamalpais oak	*Quercus parvula* var. *tamalpaisensis*	--/--/1B.3	Lower montane coniferous forest
Lobb's aquatic buttercup	*Ranunculus lobbii*	--/--/4.2	Vernal pools/cismontane woodland/forest/grassland
Victor's gooseberry	*Ribes victoris*	--/--/4.3	Chaparral/forest
Point Reyes checkerbloom	*Sidalcea calycosa* ssp. *rhizomata*	--/--/1B.2	Marshes/swamps
Marin checkerbloom	*Sidalcea hickmanii* ssp. *viridis*	--/--/1B.1	Chaparral
Santa Cruz microseris	*Stebbinsoseris decipiens*	--/--/1B.2	Forest/chaparral/coastal scrub and prairie
Tamalpais jewelflower	*Streptanthus batrachopus*	--**/**--/1B.1	Chaparral/forest
Tiburon jewelflower	*Streptanthus glandulosus* ssp. *niger*	**FE**/**SE**/1B.1	Grassland on serpentine
Mt. Tamalpais bristly jewelflower	*Streptanthus glandulosus* ssp. *pulchellus*	--/--/1B.2	Chaparral/grassland
Suisun Marsh aster	*Symphyotrichum lentum*	--/--/1B.2	Marshes/swamps
Two-fork clover	*Trifolium amoenum*	**FE**/--/1B.1	Coastal bluff scrub/grassland
Saline clover	*Trifolium hydrophilum*	--/--/1B.2	Marshes/swamps/grassland/vernal pools
Coastal triquetrella	*Triquetrella californica*	--/--/1B.2	Coastal bluff scrub/scrub

FE=Federally Endangered
FT=Federal Threatened
SE=California State Endangered
ST=California State Threatened

California Native Plant Society (CNPS)
1A: Plants presumed extinct in California
1B: Plants rare, threatened, or endangered in California and elsewhere
2: Plants rare, threatened, or endangered in California, but more common elsewhere.
3: Plants about which we need more information.
4: Plants of limited distribution, a watch list.

California Rare Plant Rank (CRPR)
0.1 - Seriously endangered in California (over 80% of occurrences threatened / high degree and immediacy of threat)
0.2 – Fairly endangered in California (20-80% occurrences threatened)
0.3 – Not very endangered in California (<20% of occurrences threatened or no current threats known)

Sources: California Native Plant Society (CNPS) (USGS 7.5-minute Novato and eight surrounding quadrangles), October 2016 California Natural Diversity Database (CNDDB) (USGS 7.5-minute Novato and eight surrounding quadrangles), November 2016

Appendix D

Noise Measurement Results

Noise Measurement 1

- Freq Weight : A
- Time Weight : FAST
- Level Range : 40-100
- Max dB : 75.3 - 2018/05/09 13:53:39
- Level Range : 40-100
- SEL : 88.7
- Leq : 59.2
-

No.s	Date Time	(dB)				
1	2018/05/09 13:38:44	53.3	53.6	53.9	55.3	57.0
6	2018/05/09 13:38:49	55.5	60.4	57.2	55.9	57.3
11	2018/05/09 13:38:54	57.8	57.6	57.5	56.3	57.1
16	2018/05/09 13:38:59	57.9	57.1	56.1	56.7	56.9
21	2018/05/09 13:39:04	57.4	58.5	60.4	63.3	62.7
26	2018/05/09 13:39:09	63.7	61.0	59.1	57.5	56.8
31	2018/05/09 13:39:14	57.1	55.9	57.1	57.8	58.2
36	2018/05/09 13:39:19	56.2	56.2	55.5	54.6	56.0
41	2018/05/09 13:39:24	56.5	55.8	56.4	56.9	56.5
46	2018/05/09 13:39:29	60.2	57.4	59.3	56.7	56.4
51	2018/05/09 13:39:34	56.3	57.1	55.7	56.9	57.2
56	2018/05/09 13:39:39	56.9	57.0	55.8	55.1	56.1
61	2018/05/09 13:39:44	54.4	55.1	56.5	55.7	57.7
66	2018/05/09 13:39:49	56.0	54.3	52.7	52.2	51.7
71	2018/05/09 13:39:54	52.8	52.3	53.0	53.5	53.7
76	2018/05/09 13:39:59	53.6	54.3	54.9	54.0	54.3
81	2018/05/09 13:40:04	54.9	55.2	55.4	55.5	57.4
86	2018/05/09 13:40:09	54.3	54.1	55.5	55.7	59.8
91	2018/05/09 13:40:14	55.7	55.8	54.6	53.8	55.0
96	2018/05/09 13:40:19	57.0	56.4	55.8	54.3	55.1
101	2018/05/09 13:40:24	56.7	57.2	57.0	57.3	57.2
106	2018/05/09 13:40:29	56.5	56.3	55.5	55.2	54.4
111	2018/05/09 13:40:34	54.8	55.1	57.7	55.7	57.1
116	2018/05/09 13:40:39	56.3	55.8	55.5	56.1	56.0
121	2018/05/09 13:40:44	55.3	55.4	55.1	55.7	55.3
126	2018/05/09 13:40:49	55.8	55.6	55.4	57.5	58.6
131	2018/05/09 13:40:54	58.0	57.3	57.9	57.4	58.1
136	2018/05/09 13:40:59	56.4	56.4	56.6	56.0	57.1
141	2018/05/09 13:41:04	56.3	56.0	54.9	53.4	55.0
146	2018/05/09 13:41:09	54.4	53.2	52.3	52.0	52.0
151	2018/05/09 13:41:14	52.7	52.6	52.6	52.9	52.2
156	2018/05/09 13:41:19	51.9	55.8	55.2	55.4	54.2
161	2018/05/09 13:41:24	55.2	54.6	55.2	55.7	56.9
166	2018/05/09 13:41:29	56.2	56.9	56.8	56.4	59.0
171	2018/05/09 13:41:34	57.5	57.7	58.0	57.0	57.6
176	2018/05/09 13:41:39	57.2	58.3	58.2	58.3	59.3
181	2018/05/09 13:41:44	59.9	59.4	60.2	60.1	60.3
186	2018/05/09 13:41:49	58.1	60.8	58.7	58.1	58.2
191	2018/05/09 13:41:54	58.9	59.5	61.9	60.7	60.0
196	2018/05/09 13:41:59	58.9	58.4	59.2	59.4	58.8
201	2018/05/09 13:42:04	58.8	58.4	57.7	59.6	59.4
206	2018/05/09 13:42:09	58.6	59.3	59.8	58.5	59.3
211	2018/05/09 13:42:14	58.7	59.8	57.7	58.3	57.4
216	2018/05/09 13:42:19	55.7	55.3	55.2	56.5	55.8
221	2018/05/09 13:42:24	56.7	57.4	58.4	59.3	59.1
226	2018/05/09 13:42:29	58.4	58.2	58.5	58.1	57.4
231	2018/05/09 13:42:34	57.0	56.9	56.8	56.3	56.7
236	2018/05/09 13:42:39	56.0	57.6	57.3	55.5	55.9
241	2018/05/09 13:42:44	56.0	54.5	54.2	53.9	54.8
246	2018/05/09 13:42:49	55.0	55.6	54.7	54.4	54.2
251	2018/05/09 13:42:54	54.2	55.0	54.8	55.0	55.1
256	2018/05/09 13:42:59	55.6	57.3	56.4	55.0	55.4
261	2018/05/09 13:43:04	58.8	61.5	60.1	61.6	60.7
266	2018/05/09 13:43:09	61.1	60.7	61.0	61.3	60.8
271	2018/05/09 13:43:14	62.1	61.4	60.6	60.5	61.5
276	2018/05/09 13:43:19	60.1	57.1	58.5	59.5	57.0
281	2018/05/09 13:43:24	57.2	57.0	58.3	58.3	60.0
286	2018/05/09 13:43:29	58.6	57.9	57.2	58.0	56.8
291	2018/05/09 13:43:34	57.1	55.5	55.2	55.7	55.1
296	2018/05/09 13:43:39	55.6	56.2	57.9	57.1	57.1
301	2018/05/09 13:43:44	57.1	57.7	58.5	58.7	58.9
306	2018/05/09 13:43:49	58.2	59.6	59.1	60.4	60.6
311	2018/05/09 13:43:54	60.9	61.9	61.6	63.7	59.9
316	2018/05/09 13:43:59	59.3	61.9	58.5	58.8	57.6
321	2018/05/09 13:44:04	56.1	55.7	56.3	57.8	58.2
326	2018/05/09 13:44:09	58.7	58.9	58.2	59.7	59.0
331	2018/05/09 13:44:14	62.0	61.1	61.0	61.8	61.4
336	2018/05/09 13:44:19	65.7	62.3	61.0	62.0	59.4
341	2018/05/09 13:44:24	59.0	58.5	62.1	57.9	57.6
346	2018/05/09 13:44:29	57.6	58.2	60.2	60.5	64.4
351	2018/05/09 13:44:34	61.8	62.2	61.9	61.3	61.6
356	2018/05/09 13:44:39	63.6	62.9	61.3	62.2	61.6
361	2018/05/09 13:44:44	61.9	60.3	60.6	60.8	61.3
366	2018/05/09 13:44:49	59.8	59.3	60.7	58.4	58.3
371	2018/05/09 13:44:54	56.8	55.7	56.4	54.8	55.9
376	2018/05/09 13:44:59	56.1	57.6	58.5	59.2	60.9
381	2018/05/09 13:45:04	64.2	65.4	62.0	61.3	64.3
386	2018/05/09 13:45:09	62.0	62.6	62.5	60.8	62.5
391	2018/05/09 13:45:14	61.6	60.0	60.3	60.2	59.4
396	2018/05/09 13:45:19	58.7	59.3	57.4	58.6	58.8
401	2018/05/09 13:45:24	58.5	58.6	58.2	60.4	57.5
406	2018/05/09 13:45:29	56.8	57.8	58.0	57.7	58.4
411	2018/05/09 13:45:34	57.7	58.8	59.0	60.3	58.3
416	2018/05/09 13:45:39	57.5	58.1	58.2	60.9	59.6
421	2018/05/09 13:45:44	57.4	58.4	58.9	58.0	57.1

426	2018/05/09	13:45:49	57.1	57.6	55.3	55.8	56.4
431	2018/05/09	13:45:54	56.5	55.9	55.2	55.2	56.0
436	2018/05/09	13:45:59	58.7	56.7	57.9	58.6	57.6
441	2018/05/09	13:46:04	59.4	59.8	67.8	60.5	60.4
446	2018/05/09	13:46:09	62.1	62.6	62.3	60.6	60.8
451	2018/05/09	13:46:14	60.5	60.1	60.6	59.8	59.7
456	2018/05/09	13:46:19	58.4	57.6	57.2	55.3	55.3
461	2018/05/09	13:46:24	55.3	54.4	56.0	56.4	58.1
466	2018/05/09	13:46:29	56.2	57.8	57.5	55.4	56.0
471	2018/05/09	13:46:34	55.1	56.0	55.5	55.5	54.5
476	2018/05/09	13:46:39	55.4	54.4	54.2	55.3	55.2
481	2018/05/09	13:46:44	55.1	54.7	54.1	54.2	53.9
486	2018/05/09	13:46:49	52.9	53.3	53.0	53.4	53.7
491	2018/05/09	13:46:54	54.4	53.1	53.7	53.1	52.9
496	2018/05/09	13:46:59	51.9	50.9	51.7	51.2	51.5
501	2018/05/09	13:47:04	52.0	53.3	52.1	55.4	53.4
506	2018/05/09	13:47:09	57.3	58.8	61.6	57.2	57.2
511	2018/05/09	13:47:14	57.5	59.9	62.2	61.9	56.6
516	2018/05/09	13:47:19	56.3	57.8	54.9	53.8	54.0
521	2018/05/09	13:47:24	54.6	56.5	56.2	60.9	55.9
526	2018/05/09	13:47:29	54.9	54.6	54.3	53.8	54.2
531	2018/05/09	13:47:34	54.4	54.0	54.3	54.5	55.5
536	2018/05/09	13:47:39	55.3	54.8	57.3	56.8	56.0
541	2018/05/09	13:47:44	57.3	57.8	58.4	58.0	59.3
546	2018/05/09	13:47:49	58.2	56.7	56.7	56.2	56.3
551	2018/05/09	13:47:54	56.8	57.3	55.3	56.2	55.4
556	2018/05/09	13:47:59	54.7	55.0	60.8	56.4	54.9
561	2018/05/09	13:48:04	54.9	57.4	54.8	56.6	57.2
566	2018/05/09	13:48:09	57.2	56.6	58.3	57.0	56.2
571	2018/05/09	13:48:14	57.7	57.0	56.2	57.0	59.0
576	2018/05/09	13:48:19	59.1	56.0	55.3	59.2	58.0
581	2018/05/09	13:48:24	58.4	56.1	63.8	55.1	54.4
586	2018/05/09	13:48:29	58.0	54.3	54.6	55.8	59.8
591	2018/05/09	13:48:34	58.5	60.6	58.4	57.8	57.6
596	2018/05/09	13:48:39	56.7	57.6	59.4	60.2	59.6
601	2018/05/09	13:48:44	58.6	58.3	56.7	57.6	56.8
606	2018/05/09	13:48:49	58.2	57.7	57.3	56.3	56.4
611	2018/05/09	13:48:54	56.3	56.8	56.7	56.7	57.8
616	2018/05/09	13:48:59	57.9	58.4	58.2	57.6	58.2
621	2018/05/09	13:49:04	58.9	58.2	58.0	58.7	57.4
626	2018/05/09	13:49:09	57.7	56.9	58.6	59.2	60.3
631	2018/05/09	13:49:14	61.8	60.8	59.3	59.2	58.9
636	2018/05/09	13:49:19	60.7	58.2	58.0	59.6	60.4
641	2018/05/09	13:49:24	58.5	58.0	59.0	59.1	58.2
646	2018/05/09	13:49:29	59.8	61.7	60.4	60.2	59.3
651	2018/05/09	13:49:34	58.9	58.7	58.2	59.4	58.7
656	2018/05/09	13:49:39	58.3	58.7	60.0	60.7	60.2
661	2018/05/09	13:49:44	58.3	57.2	59.3	60.2	58.8
666	2018/05/09	13:49:49	58.0	58.3	59.8	58.9	58.6
671	2018/05/09	13:49:54	58.7	58.0	58.5	58.4	59.8
676	2018/05/09	13:49:59	60.0	62.4	62.6	60.8	60.1
681	2018/05/09	13:50:04	61.2	60.7	61.8	61.0	62.5
686	2018/05/09	13:50:09	65.7	59.2	61.2	61.7	60.5
691	2018/05/09	13:50:14	64.4	64.9	65.0	63.6	67.5
696	2018/05/09	13:50:19	62.6	62.7	63.0	61.4	62.6
701	2018/05/09	13:50:24	61.5	67.1	63.9	61.8	64.9
706	2018/05/09	13:50:29	62.6	62.3	63.7	62.9	65.7
711	2018/05/09	13:50:34	64.4	62.9	64.0	63.6	63.2
716	2018/05/09	13:50:39	63.5	64.7	68.0	67.8	65.3
721	2018/05/09	13:50:44	63.3	61.6	63.1	63.4	61.3
726	2018/05/09	13:50:49	59.5	59.4	59.7	64.5	60.0
731	2018/05/09	13:50:54	61.2	59.1	58.2	58.8	62.6
736	2018/05/09	13:50:59	58.3	57.8	58.3	57.9	59.7
741	2018/05/09	13:51:04	57.9	58.1	59.2	59.1	58.8
746	2018/05/09	13:51:09	58.8	58.1	57.5	61.1	58.4
751	2018/05/09	13:51:14	59.4	61.4	61.8	58.8	59.4
756	2018/05/09	13:51:19	58.6	58.9	59.0	59.4	58.8
761	2018/05/09	13:51:24	59.3	59.6	58.8	59.1	59.9
766	2018/05/09	13:51:29	60.5	58.7	57.9	57.9	60.3
771	2018/05/09	13:51:34	59.3	59.8	58.9	58.9	58.9
776	2018/05/09	13:51:39	59.2	57.8	57.6	57.7	62.5
781	2018/05/09	13:51:44	59.1	57.7	57.8	57.4	58.3
786	2018/05/09	13:51:49	58.2	58.3	57.4	59.1	62.9
791	2018/05/09	13:51:54	64.2	62.4	63.8	67.9	69.5
796	2018/05/09	13:51:59	67.9	64.0	62.0	59.4	57.9
801	2018/05/09	13:52:04	58.1	57.7	57.2	58.7	57.4
806	2018/05/09	13:52:09	57.8	57.4	59.0	58.8	59.4
811	2018/05/09	13:52:14	61.1	57.4	55.9	55.6	54.9
816	2018/05/09	13:52:19	55.2	56.1	57.2	60.9	62.7
821	2018/05/09	13:52:24	65.3	62.7	59.3	57.7	56.3
826	2018/05/09	13:52:29	55.8	57.6	56.5	58.0	59.0
831	2018/05/09	13:52:34	62.5	60.7	61.6	62.0	63.1
836	2018/05/09	13:52:39	63.8	60.5	63.3	62.4	63.7
841	2018/05/09	13:52:44	62.1	61.3	59.0	59.8	58.3
846	2018/05/09	13:52:49	60.4	58.8	58.9	58.9	58.5
851	2018/05/09	13:52:54	58.4	58.9	58.8	58.4	58.4
856	2018/05/09	13:52:59	57.2	57.0	58.0	59.7	61.2
861	2018/05/09	13:53:04	61.4	59.9	58.6	58.6	58.9
866	2018/05/09	13:53:09	58.3	56.7	56.5	56.4	55.8
871	2018/05/09	13:53:14	55.1	55.4	55.6	55.6	57.3
876	2018/05/09	13:53:19	55.3	55.9	55.7	56.7	55.4
881	2018/05/09	13:53:24	56.0	56.6	56.4	56.8	56.4
886	2018/05/09	13:53:29	55.4	56.3	58.6	58.9	58.3
891	2018/05/09	13:53:34	58.1	58.0	59.2	65.5	59.9
896	2018/05/09	13:53:39	69.6	58.7	58.4	60.0	58.1

Noise Measurement 2

- Freq Weight : A
- Time Weight : FAST
- Level Range : 40-100
- Max dB : 80.2 - 2018/05/09 14:21:28
- Level Range : 40-100
- SEL : 95.2
- Leq : 65.7
-

No.s	Date Time	(dB)				
1	2018/05/09 14:15:08	49.7	50.9	53.3	55.9	57.1
6	2018/05/09 14:15:13	58.0	58.2	57.6	56.6	53.9
11	2018/05/09 14:15:18	51.8	52.0	51.0	51.9	51.4
16	2018/05/09 14:15:23	51.7	52.0	54.6	51.2	51.0
21	2018/05/09 14:15:28	50.6	51.0	51.6	52.1	53.0
26	2018/05/09 14:15:33	54.2	57.0	63.0	68.1	70.0
31	2018/05/09 14:15:38	69.5	66.7	66.9	57.8	55.2
36	2018/05/09 14:15:43	54.8	56.0	60.1	60.8	64.4
41	2018/05/09 14:15:48	72.1	71.9	64.5	62.4	66.9
46	2018/05/09 14:15:53	69.1	70.6	69.0	62.6	63.5
51	2018/05/09 14:15:58	65.5	68.8	65.6	59.1	57.9
56	2018/05/09 14:16:03	58.7	61.3	65.1	67.2	66.6
61	2018/05/09 14:16:08	61.7	60.4	59.8	63.8	68.9
66	2018/05/09 14:16:13	71.1	70.6	69.5	68.5	67.2
71	2018/05/09 14:16:18	69.7	68.5	66.3	59.9	58.1
76	2018/05/09 14:16:23	58.8	58.2	61.2	63.1	67.6
81	2018/05/09 14:16:28	67.7	62.1	56.9	57.4	62.9
86	2018/05/09 14:16:33	63.6	66.7	65.9	65.8	64.9
91	2018/05/09 14:16:38	61.6	61.1	59.9	58.2	58.7
96	2018/05/09 14:16:43	60.8	64.9	67.0	67.9	67.8
101	2018/05/09 14:16:48	59.6	59.9	60.8	60.6	59.3
106	2018/05/09 14:16:53	57.8	59.0	61.6	63.5	70.6
111	2018/05/09 14:16:58	68.9	61.9	59.2	62.2	64.7
116	2018/05/09 14:17:03	71.4	77.2	72.8	73.2	67.2
121	2018/05/09 14:17:08	63.1	64.9	67.9	69.6	65.1
126	2018/05/09 14:17:13	58.8	58.6	58.7	61.3	62.0
131	2018/05/09 14:17:18	62.3	65.8	70.6	65.7	57.9
136	2018/05/09 14:17:23	56.8	58.4	63.2	69.2	75.3
141	2018/05/09 14:17:28	69.5	59.2	57.0	57.1	56.7
146	2018/05/09 14:17:33	59.4	59.9	60.8	60.4	59.0
151	2018/05/09 14:17:38	56.4	56.6	56.6	58.6	60.2
156	2018/05/09 14:17:43	59.7	62.5	64.6	67.8	66.6
161	2018/05/09 14:17:48	57.7	56.3	56.7	59.1	62.5
166	2018/05/09 14:17:53	64.5	66.7	65.8	58.0	57.5
171	2018/05/09 14:17:58	59.9	64.1	65.0	68.1	64.7
176	2018/05/09 14:18:03	62.6	65.3	69.3	65.7	61.4
181	2018/05/09 14:18:08	63.8	66.4	69.8	69.8	69.1
186	2018/05/09 14:18:13	68.6	73.9	77.6	70.0	61.2
191	2018/05/09 14:18:18	59.9	60.7	62.9	65.9	68.1
196	2018/05/09 14:18:23	70.6	73.1	71.3	71.8	70.7
201	2018/05/09 14:18:28	68.1	65.2	62.0	64.0	65.0
206	2018/05/09 14:18:33	67.7	66.9	62.4	60.1	63.5
211	2018/05/09 14:18:38	70.5	72.4	65.4	57.9	60.4
216	2018/05/09 14:18:43	64.8	67.2	72.4	71.4	73.7
221	2018/05/09 14:18:48	76.1	68.0	60.7	61.5	64.2
226	2018/05/09 14:18:53	68.9	72.7	64.2	59.6	61.2
231	2018/05/09 14:18:58	62.0	62.3	61.0	62.1	65.6
236	2018/05/09 14:19:03	69.7	66.2	62.0	63.7	67.4
241	2018/05/09 14:19:08	69.1	65.8	56.5	54.5	53.4
246	2018/05/09 14:19:13	52.9	50.8	49.6	50.5	52.5
251	2018/05/09 14:19:18	52.9	52.5	51.8	52.7	55.1
256	2018/05/09 14:19:23	56.3	58.6	60.5	68.7	72.6
261	2018/05/09 14:19:28	64.1	59.5	59.8	60.6	61.9
266	2018/05/09 14:19:33	61.6	64.0	63.4	62.7	58.3
271	2018/05/09 14:19:38	59.5	62.4	67.6	68.1	72.6
276	2018/05/09 14:19:43	72.1	75.3	70.8	63.1	60.4
281	2018/05/09 14:19:48	59.2	58.5	56.3	56.4	57.1
286	2018/05/09 14:19:53	54.5	55.1	55.3	58.4	64.4
291	2018/05/09 14:19:58	69.6	70.3	60.4	57.6	58.6
296	2018/05/09 14:20:03	56.5	57.3	59.5	61.6	66.6
301	2018/05/09 14:20:08	68.6	59.5	55.3	53.7	53.5
306	2018/05/09 14:20:13	54.7	55.8	59.1	61.1	61.7
311	2018/05/09 14:20:18	62.4	66.3	68.8	72.3	69.4
316	2018/05/09 14:20:23	60.8	58.3	56.6	55.1	55.3
321	2018/05/09 14:20:28	55.8	56.3	57.0	55.2	55.5
326	2018/05/09 14:20:33	52.8	51.7	50.9	50.2	49.8
331	2018/05/09 14:20:38	51.4	51.7	55.5	56.5	58.1
336	2018/05/09 14:20:43	55.5	55.4	52.8	50.1	50.3
341	2018/05/09 14:20:48	50.8	49.0	49.0	49.8	51.0
346	2018/05/09 14:20:53	50.7	52.7	56.4	61.0	64.3
351	2018/05/09 14:20:58	73.1	71.2	60.5	56.1	51.6
356	2018/05/09 14:21:03	51.4	54.1	58.5	61.8	63.7
361	2018/05/09 14:21:08	68.5	67.2	58.5	55.9	55.0
366	2018/05/09 14:21:13	55.6	56.5	60.3	62.6	65.2
371	2018/05/09 14:21:18	70.1	71.0	67.0	60.4	60.0
376	2018/05/09 14:21:23	59.2	60.5	64.8	68.7	70.8
381	2018/05/09 14:21:28	69.2	60.8	60.3	61.7	63.5
386	2018/05/09 14:21:33	65.4	68.9	72.1	67.0	60.7
391	2018/05/09 14:21:38	59.0	60.2	61.1	62.5	65.8
396	2018/05/09 14:21:43	70.8	69.8	65.9	71.9	71.9
401	2018/05/09 14:21:48	67.2	71.1	70.8	62.4	60.3
406	2018/05/09 14:21:53	61.9	61.0	61.1	61.0	64.6
411	2018/05/09 14:21:58	66.0	67.3	67.4	63.9	63.9
416	2018/05/09 14:22:03	67.0	68.6	65.5	59.6	59.3
421	2018/05/09 14:22:08	59.1	61.6	61.5	60.5	61.4

426	2018/05/09	14:22:13	61.1	58.9	61.1	56.9	55.5
431	2018/05/09	14:22:18	57.1	58.2	59.9	61.1	63.4
436	2018/05/09	14:22:23	60.7	60.6	59.3	59.0	59.8
441	2018/05/09	14:22:28	59.1	60.3	60.2	59.4	59.3
446	2018/05/09	14:22:33	67.2	71.2	76.0	76.0	73.7
451	2018/05/09	14:22:38	67.5	70.2	70.5	65.3	62.9
456	2018/05/09	14:22:43	61.3	61.1	63.8	67.6	68.2
461	2018/05/09	14:22:48	65.5	63.5	62.2	60.8	59.3
466	2018/05/09	14:22:53	56.6	58.6	59.6	63.5	63.5
471	2018/05/09	14:22:58	66.2	75.2	75.2	68.4	71.5
476	2018/05/09	14:23:03	70.1	61.9	57.6	56.5	56.7
481	2018/05/09	14:23:08	55.6	55.1	54.9	55.8	54.8
486	2018/05/09	14:23:13	54.1	53.9	54.9	52.4	52.0
491	2018/05/09	14:23:18	52.8	53.2	53.1	52.3	51.6
496	2018/05/09	14:23:23	51.1	52.5	53.8	54.0	56.0
501	2018/05/09	14:23:28	58.0	62.2	64.1	67.3	67.7
506	2018/05/09	14:23:33	70.3	69.7	67.7	67.9	68.7
511	2018/05/09	14:23:38	63.3	60.5	59.5	58.1	56.7
516	2018/05/09	14:23:43	57.3	57.8	59.4	60.9	62.8
521	2018/05/09	14:23:48	65.9	69.0	68.6	67.5	61.9
526	2018/05/09	14:23:53	62.2	67.8	70.7	74.9	63.6
531	2018/05/09	14:23:58	60.5	64.1	68.2	67.8	62.8
536	2018/05/09	14:24:03	56.9	56.0	57.1	57.6	60.9
541	2018/05/09	14:24:08	64.1	71.0	69.0	60.1	61.0
546	2018/05/09	14:24:13	65.9	69.2	69.6	69.2	66.9
551	2018/05/09	14:24:18	62.2	59.1	58.8	57.9	57.6
556	2018/05/09	14:24:23	59.2	62.3	68.8	74.1	73.5
561	2018/05/09	14:24:28	72.0	62.4	59.0	58.4	58.4
566	2018/05/09	14:24:33	59.8	65.3	68.6	71.8	70.8
571	2018/05/09	14:24:38	61.3	59.6	58.3	58.3	56.3
576	2018/05/09	14:24:43	56.4	55.2	52.9	53.0	53.2
581	2018/05/09	14:24:48	52.4	51.8	53.2	55.7	57.4
586	2018/05/09	14:24:53	58.3	57.9	57.4	56.0	54.8
591	2018/05/09	14:24:58	56.6	57.8	59.0	63.6	67.6
596	2018/05/09	14:25:03	72.6	74.0	64.8	64.9	69.3
601	2018/05/09	14:25:08	68.1	65.8	69.0	69.3	69.8
606	2018/05/09	14:25:13	74.3	64.7	58.6	58.1	56.5
611	2018/05/09	14:25:18	55.8	55.2	53.0	52.9	52.9
616	2018/05/09	14:25:23	52.3	53.2	52.8	54.8	55.1
621	2018/05/09	14:25:28	53.4	55.0	56.0	56.9	57.9
626	2018/05/09	14:25:33	60.6	61.7	62.4	63.0	65.7
631	2018/05/09	14:25:38	68.5	70.8	67.5	62.5	65.5
636	2018/05/09	14:25:43	66.8	66.6	66.3	68.9	66.3
641	2018/05/09	14:25:48	61.7	59.3	59.4	61.5	59.6
646	2018/05/09	14:25:53	58.5	59.6	60.8	64.3	66.0
651	2018/05/09	14:25:58	68.4	64.6	59.6	64.4	60.6
656	2018/05/09	14:26:03	67.0	60.3	58.8	58.8	60.6
661	2018/05/09	14:26:08	58.8	57.9	62.2	61.9	60.3
666	2018/05/09	14:26:13	61.6	64.7	67.6	69.2	69.7
671	2018/05/09	14:26:18	69.7	71.0	65.2	60.7	62.1
676	2018/05/09	14:26:23	59.4	56.8	57.3	60.6	60.4
681	2018/05/09	14:26:28	60.3	61.8	63.7	65.1	67.8
686	2018/05/09	14:26:33	75.2	74.5	62.8	60.0	61.0
691	2018/05/09	14:26:38	61.3	61.3	61.1	61.2	59.4
696	2018/05/09	14:26:43	60.0	60.1	64.1	65.1	65.7
701	2018/05/09	14:26:48	63.5	68.8	75.5	67.9	66.6
706	2018/05/09	14:26:53	71.0	68.8	68.7	71.7	61.6
711	2018/05/09	14:26:58	57.8	55.8	56.8	56.9	57.3
716	2018/05/09	14:27:03	61.8	63.7	70.4	70.0	59.7
721	2018/05/09	14:27:08	55.7	53.7	53.8	54.1	55.9
726	2018/05/09	14:27:13	60.8	61.0	66.0	66.3	65.0
731	2018/05/09	14:27:18	59.8	60.1	64.7	68.4	76.2
736	2018/05/09	14:27:23	74.8	63.9	63.3	64.6	70.0
741	2018/05/09	14:27:28	72.7	63.8	58.7	56.8	55.9
746	2018/05/09	14:27:33	56.7	57.1	55.9	55.0	56.0
751	2018/05/09	14:27:38	56.4	52.4	52.1	52.1	52.4
756	2018/05/09	14:27:43	52.4	50.9	50.9	49.8	50.9
761	2018/05/09	14:27:48	50.0	51.0	51.9	53.4	55.9
766	2018/05/09	14:27:53	58.0	58.4	56.9	57.5	56.2
771	2018/05/09	14:27:58	57.8	59.3	61.6	64.2	65.8
776	2018/05/09	14:28:03	66.6	65.9	62.4	63.7	65.6
781	2018/05/09	14:28:08	64.5	61.0	58.4	57.7	57.9
786	2018/05/09	14:28:13	59.7	60.6	63.0	66.5	70.7
791	2018/05/09	14:28:18	73.6	73.3	67.8	66.5	66.7
796	2018/05/09	14:28:23	69.8	67.4	61.2	60.8	61.1
801	2018/05/09	14:28:28	60.0	60.0	59.1	56.4	55.5
806	2018/05/09	14:28:33	53.9	53.5	51.4	50.9	51.9
811	2018/05/09	14:28:38	52.9	52.0	51.8	51.4	52.8
816	2018/05/09	14:28:43	54.0	56.1	58.6	62.3	69.1
821	2018/05/09	14:28:48	72.3	71.0	63.1	57.3	56.7
826	2018/05/09	14:28:53	56.3	56.3	55.6	56.2	54.7
831	2018/05/09	14:28:58	54.2	54.2	54.9	57.2	57.9
836	2018/05/09	14:29:03	59.0	59.4	59.9	60.4	60.5
841	2018/05/09	14:29:08	60.3	60.5	59.9	61.9	65.9
846	2018/05/09	14:29:13	70.7	70.2	66.4	61.0	59.5
851	2018/05/09	14:29:18	56.4	53.7	51.6	51.3	51.7
856	2018/05/09	14:29:23	50.9	52.7	54.2	55.7	57.3
861	2018/05/09	14:29:28	58.7	59.8	58.5	57.5	57.7
866	2018/05/09	14:29:33	59.3	60.4	60.7	59.6	60.4
871	2018/05/09	14:29:38	58.4	57.8	59.5	64.8	67.4
876	2018/05/09	14:29:43	69.4	66.7	65.7	71.1	68.4
881	2018/05/09	14:29:48	60.4	57.7	60.7	61.9	59.6
886	2018/05/09	14:29:53	61.6	65.8	68.2	67.1	62.3
891	2018/05/09	14:29:58	62.4	71.5	69.4	58.5	56.5
896	2018/05/09	14:30:03	55.6	55.6	55.0	54.9	55.3

- Freq Weight : A
- Time Weight : FAST
- Level Range : 40-100
- Max dB : 87.7 - 2018/05/09 14:55:34
- Level Range : 40-100
- SEL : 99.5
- Leq : 70.0
-

No.s	Date Time	(dB)				
1	2018/05/09 14:45:42	61.8	61.7	61.8	61.7	65.2
6	2018/05/09 14:45:47	64.9	71.1	78.6	72.4	65.6
11	2018/05/09 14:45:52	63.8	61.6	61.3	60.7	60.4
16	2018/05/09 14:45:57	60.0	62.0	62.5	65.5	71.2
21	2018/05/09 14:46:02	75.9	66.5	61.7	63.3	62.5
26	2018/05/09 14:46:07	68.0	71.3	70.8	71.3	71.3
31	2018/05/09 14:46:12	71.8	76.2	79.7	72.1	66.6
36	2018/05/09 14:46:17	65.1	62.3	63.7	62.0	63.0
41	2018/05/09 14:46:22	63.4	63.7	62.9	64.2	62.6
46	2018/05/09 14:46:27	62.7	62.1	62.5	62.4	62.1
51	2018/05/09 14:46:32	63.6	62.7	61.3	61.9	64.5
56	2018/05/09 14:46:37	62.8	61.0	61.3	60.4	60.6
61	2018/05/09 14:46:42	61.6	63.1	65.6	69.6	71.0
66	2018/05/09 14:46:47	68.2	64.3	64.1	61.9	61.3
71	2018/05/09 14:46:52	61.2	59.9	58.0	59.6	58.8
76	2018/05/09 14:46:57	58.3	57.8	57.6	57.0	57.3
81	2018/05/09 14:47:02	58.0	61.7	66.2	71.5	80.0
86	2018/05/09 14:47:07	81.0	67.9	61.1	59.2	58.5
91	2018/05/09 14:47:12	57.7	59.4	59.8	58.8	58.7
96	2018/05/09 14:47:17	60.1	59.8	59.0	59.8	60.1
101	2018/05/09 14:47:22	59.4	58.9	61.5	59.6	60.9
106	2018/05/09 14:47:27	64.5	61.2	60.8	64.0	63.4
111	2018/05/09 14:47:32	63.1	61.4	61.3	61.2	62.7
116	2018/05/09 14:47:37	62.0	63.0	63.0	64.4	64.9
121	2018/05/09 14:47:42	69.9	75.3	72.8	69.9	66.1
126	2018/05/09 14:47:47	64.6	64.6	66.3	67.6	77.5
131	2018/05/09 14:47:52	78.1	68.7	63.0	61.4	60.3
136	2018/05/09 14:47:57	59.9	59.1	61.0	67.3	70.5
141	2018/05/09 14:48:02	79.5	76.9	64.1	61.8	62.4
146	2018/05/09 14:48:07	69.4	73.7	72.1	69.1	67.8
151	2018/05/09 14:48:12	68.3	70.1	74.9	78.6	69.6
156	2018/05/09 14:48:17	65.2	60.9	63.0	60.6	59.8
161	2018/05/09 14:48:22	60.4	60.3	66.0	70.9	70.6
166	2018/05/09 14:48:27	68.5	64.6	63.0	64.8	60.1
171	2018/05/09 14:48:32	59.5	61.2	61.7	64.8	66.2
176	2018/05/09 14:48:37	69.6	77.6	73.2	63.2	59.9
181	2018/05/09 14:48:42	60.5	61.8	64.7	67.9	74.8
186	2018/05/09 14:48:47	73.5	65.7	62.9	62.1	61.3
191	2018/05/09 14:48:52	62.4	63.0	66.6	73.3	78.4
196	2018/05/09 14:48:57	69.9	65.0	62.3	62.9	65.2
201	2018/05/09 14:49:02	68.1	68.2	66.1	64.5	65.5
206	2018/05/09 14:49:07	72.8	81.2	72.2	66.3	62.3
211	2018/05/09 14:49:12	60.6	61.9	60.5	59.6	59.6
216	2018/05/09 14:49:17	64.3	59.0	59.8	61.8	65.1
221	2018/05/09 14:49:22	67.5	66.8	64.2	61.9	62.6
226	2018/05/09 14:49:27	63.0	64.0	71.1	75.2	66.5
231	2018/05/09 14:49:32	66.3	70.7	69.5	65.7	64.4
236	2018/05/09 14:49:37	63.0	61.7	61.4	61.1	60.9
241	2018/05/09 14:49:42	60.1	60.1	60.5	61.0	59.8
246	2018/05/09 14:49:47	60.7	59.2	60.2	61.8	67.8
251	2018/05/09 14:49:52	72.0	82.0	72.4	63.8	61.5
256	2018/05/09 14:49:57	63.9	68.7	72.5	73.1	71.5
261	2018/05/09 14:50:02	76.3	79.6	71.0	67.7	70.2
266	2018/05/09 14:50:07	79.2	79.0	69.4	64.2	64.4
271	2018/05/09 14:50:12	68.3	76.1	74.5	65.4	62.5
276	2018/05/09 14:50:17	60.8	61.8	68.5	79.2	70.8
281	2018/05/09 14:50:22	62.5	59.7	62.8	60.5	62.1
286	2018/05/09 14:50:27	60.9	60.8	60.2	61.6	61.7
291	2018/05/09 14:50:32	61.6	60.0	62.3	64.5	62.6
296	2018/05/09 14:50:37	61.7	61.8	61.1	63.2	64.6
301	2018/05/09 14:50:42	69.7	80.3	74.6	77.6	69.4
306	2018/05/09 14:50:47	62.2	61.0	61.2	64.3	65.2
311	2018/05/09 14:50:52	68.6	68.2	68.2	74.8	83.1
316	2018/05/09 14:50:57	74.7	63.4	59.5	57.4	55.2
321	2018/05/09 14:51:02	55.8	56.5	55.9	56.6	58.8
326	2018/05/09 14:51:07	60.5	59.5	62.2	58.9	58.9
331	2018/05/09 14:51:12	60.5	60.8	60.1	61.3	63.0
336	2018/05/09 14:51:17	61.9	64.4	61.1	64.4	67.8
341	2018/05/09 14:51:22	69.0	67.0	66.4	63.8	62.8
346	2018/05/09 14:51:27	64.1	63.3	62.0	62.3	60.4
351	2018/05/09 14:51:32	60.3	60.5	60.7	61.4	60.1
356	2018/05/09 14:51:37	59.9	59.0	58.7	58.8	59.0
361	2018/05/09 14:51:42	59.5	59.2	58.6	59.3	58.5
366	2018/05/09 14:51:47	60.5	61.4	65.1	70.4	81.5
371	2018/05/09 14:51:52	79.2	67.3	62.9	61.5	61.0
376	2018/05/09 14:51:57	60.4	61.0	63.4	66.3	75.1
381	2018/05/09 14:52:02	78.4	67.6	61.8	59.3	59.7
386	2018/05/09 14:52:07	58.9	60.3	61.2	62.0	61.9
391	2018/05/09 14:52:12	61.4	60.8	61.0	64.5	64.0
396	2018/05/09 14:52:17	61.7	63.1	62.4	64.1	63.4
401	2018/05/09 14:52:22	63.8	65.8	70.5	78.2	78.0
406	2018/05/09 14:52:27	77.3	73.8	66.3	61.7	59.6
411	2018/05/09 14:52:32	60.5	59.1	60.5	60.5	61.0
416	2018/05/09 14:52:37	65.2	69.8	71.3	65.0	63.5
421	2018/05/09 14:52:42	69.6	63.7	60.9	59.8	58.8

426	2018/05/09	14:52:47	59.4	58.5	58.8	60.5	59.3
431	2018/05/09	14:52:52	60.4	60.8	59.0	59.2	59.5
436	2018/05/09	14:52:57	58.5	59.6	59.5	60.7	60.1
441	2018/05/09	14:53:02	58.6	60.3	61.5	61.0	59.9
446	2018/05/09	14:53:07	60.2	60.7	60.3	59.5	60.1
451	2018/05/09	14:53:12	59.8	58.6	57.9	58.8	59.5
456	2018/05/09	14:53:17	58.3	57.7	59.5	61.6	60.3
461	2018/05/09	14:53:22	59.5	61.0	60.6	62.5	62.3
466	2018/05/09	14:53:27	63.5	62.0	61.7	63.0	63.3
471	2018/05/09	14:53:32	64.2	62.1	62.8	62.1	63.1
476	2018/05/09	14:53:37	71.1	74.0	82.1	75.5	69.4
481	2018/05/09	14:53:42	65.4	65.7	61.6	62.8	60.8
486	2018/05/09	14:53:47	61.4	61.4	61.3	60.6	59.5
491	2018/05/09	14:53:52	60.0	61.2	60.3	60.3	62.3
496	2018/05/09	14:53:57	62.3	62.4	62.9	62.0	63.4
501	2018/05/09	14:54:02	64.8	69.6	73.9	73.6	75.6
506	2018/05/09	14:54:07	81.1	69.8	70.9	72.5	74.3
511	2018/05/09	14:54:12	73.3	71.5	71.0	69.2	69.8
516	2018/05/09	14:54:17	68.6	68.2	69.5	63.8	62.8
521	2018/05/09	14:54:22	62.1	61.7	60.7	60.7	61.0
526	2018/05/09	14:54:27	61.2	60.1	58.9	59.4	58.6
531	2018/05/09	14:54:32	57.5	58.5	57.3	58.4	58.1
536	2018/05/09	14:54:37	59.2	58.7	61.4	58.8	59.4
541	2018/05/09	14:54:42	59.3	60.3	61.4	63.7	69.7
546	2018/05/09	14:54:47	73.3	70.5	67.8	64.7	62.9
551	2018/05/09	14:54:52	62.2	64.6	63.0	64.9	66.4
556	2018/05/09	14:54:57	69.4	68.5	64.9	61.8	60.6
561	2018/05/09	14:55:02	61.9	61.7	60.7	59.2	62.5
566	2018/05/09	14:55:07	61.7	60.9	60.1	59.6	62.0
571	2018/05/09	14:55:12	59.2	59.0	59.1	60.7	66.8
576	2018/05/09	14:55:17	68.2	62.7	63.8	63.8	63.0
581	2018/05/09	14:55:22	63.2	62.9	64.2	64.3	66.8
586	2018/05/09	14:55:27	70.0	71.2	69.6	64.6	63.4
591	2018/05/09	14:55:32	61.3	82.3	68.8	69.3	71.9
596	2018/05/09	14:55:37	73.4	71.9	69.5	74.3	78.9
601	2018/05/09	14:55:42	67.9	64.0	63.8	63.6	63.3
606	2018/05/09	14:55:47	63.4	65.5	65.9	65.0	65.6
611	2018/05/09	14:55:52	63.5	63.3	63.9	64.5	68.9
616	2018/05/09	14:55:57	68.3	74.0	82.9	76.7	70.2
621	2018/05/09	14:56:02	70.0	65.6	67.4	70.2	68.0
626	2018/05/09	14:56:07	66.3	64.3	68.2	69.4	72.0
631	2018/05/09	14:56:12	71.7	74.5	79.0	67.3	65.6
636	2018/05/09	14:56:17	64.5	63.2	62.0	61.3	62.5
641	2018/05/09	14:56:22	62.6	61.8	62.8	66.5	68.3
646	2018/05/09	14:56:27	75.6	76.2	69.2	65.8	69.2
651	2018/05/09	14:56:32	78.9	77.0	76.7	78.3	70.3
656	2018/05/09	14:56:37	69.5	75.5	71.1	66.0	63.4
661	2018/05/09	14:56:42	61.6	60.9	60.8	59.7	59.4
666	2018/05/09	14:56:47	58.9	58.6	58.3	58.6	59.2
671	2018/05/09	14:56:52	58.6	59.6	60.0	60.0	59.2
676	2018/05/09	14:56:57	60.1	60.8	62.3	63.3	59.5
681	2018/05/09	14:57:02	61.3	62.1	60.2	61.9	62.4
686	2018/05/09	14:57:07	61.4	60.7	61.4	60.5	61.4
691	2018/05/09	14:57:12	63.0	62.7	64.9	62.5	60.3
696	2018/05/09	14:57:17	60.7	59.9	60.9	61.0	60.2
701	2018/05/09	14:57:22	60.3	61.2	60.3	60.1	61.6
706	2018/05/09	14:57:27	61.9	60.9	61.8	62.2	61.6
711	2018/05/09	14:57:32	59.4	60.0	60.8	60.6	60.9
716	2018/05/09	14:57:37	60.4	60.6	60.7	61.9	61.7
721	2018/05/09	14:57:42	61.8	62.7	62.7	62.8	63.0
726	2018/05/09	14:57:47	62.0	62.4	62.5	62.4	64.0
731	2018/05/09	14:57:52	68.3	77.3	74.8	66.1	63.2
736	2018/05/09	14:57:57	60.9	61.9	60.9	62.4	66.2
741	2018/05/09	14:58:02	69.7	78.2	82.3	71.2	62.5
746	2018/05/09	14:58:07	60.3	59.9	58.4	59.9	59.8
751	2018/05/09	14:58:12	60.2	59.8	60.7	61.1	62.3
756	2018/05/09	14:58:17	61.4	61.4	60.8	61.0	61.2
761	2018/05/09	14:58:22	59.3	59.7	59.3	60.2	61.0
766	2018/05/09	14:58:27	60.5	61.8	62.4	62.5	62.9
771	2018/05/09	14:58:32	61.9	63.3	67.0	71.1	71.9
776	2018/05/09	14:58:37	70.9	72.8	77.9	70.8	65.0
781	2018/05/09	14:58:42	68.0	72.0	74.1	70.0	65.9
786	2018/05/09	14:58:47	63.8	63.0	63.3	64.5	63.7
791	2018/05/09	14:58:52	61.5	61.9	62.1	63.1	64.3
796	2018/05/09	14:58:57	62.7	61.6	61.7	61.2	62.5
801	2018/05/09	14:59:02	66.1	72.4	81.2	72.6	67.3
806	2018/05/09	14:59:07	64.7	70.3	79.5	74.2	82.2
811	2018/05/09	14:59:12	81.7	71.3	68.0	77.9	83.0
816	2018/05/09	14:59:17	70.7	68.8	71.0	79.8	77.4
821	2018/05/09	14:59:22	69.9	65.2	63.8	62.8	65.9
826	2018/05/09	14:59:27	71.7	78.5	71.8	66.0	67.9
831	2018/05/09	14:59:32	74.4	79.1	69.3	66.3	67.4
836	2018/05/09	14:59:37	75.7	78.8	70.9	66.1	70.3
841	2018/05/09	14:59:42	79.1	75.9	69.2	75.4	77.9
846	2018/05/09	14:59:47	79.0	75.0	66.3	64.0	62.4
851	2018/05/09	14:59:52	63.9	64.0	65.2	65.2	65.2
856	2018/05/09	14:59:57	64.5	64.4	64.9	63.7	63.6
861	2018/05/09	15:00:02	62.9	63.4	64.4	65.6	68.5
866	2018/05/09	15:00:07	72.7	73.3	67.5	64.7	66.5
871	2018/05/09	15:00:12	67.5	69.1	70.5	73.5	77.8
876	2018/05/09	15:00:17	72.7	75.8	75.3	73.4	75.1
881	2018/05/09	15:00:22	83.1	76.6	68.2	66.1	64.7
886	2018/05/09	15:00:27	64.2	64.7	63.8	64.1	63.9
891	2018/05/09	15:00:32	62.2	61.9	62.3	61.4	62.9
896	2018/05/09	15:00:37	63.9	67.0	70.1	70.3	68.3

- Freq Weight : A
- Time Weight : FAST
- Level Range : 40-100
- Max dB : 79.8 - 2018/05/09 10:30:52
- Level Range : 40-100
- SEL : 94.2
- Leq : 64.7
-

No.s	Date Time	(dB)				
1	2018/05/09 10:26:30	61.5	60.1	59.8	59.7	60.3
6	2018/05/09 10:26:35	63.9	66.9	71.6	68.4	64.7
11	2018/05/09 10:26:40	63.3	65.1	68.5	68.7	66.7
16	2018/05/09 10:26:45	62.5	59.7	58.1	57.0	56.7
21	2018/05/09 10:26:50	56.0	58.4	60.3	62.7	66.6
26	2018/05/09 10:26:55	68.7	68.9	69.7	67.9	66.2
31	2018/05/09 10:27:00	67.0	69.5	66.3	62.9	59.6
36	2018/05/09 10:27:05	60.8	61.1	63.1	62.8	61.3
41	2018/05/09 10:27:10	61.3	59.1	57.3	55.8	56.8
46	2018/05/09 10:27:15	56.6	56.2	57.1	57.1	58.9
51	2018/05/09 10:27:20	60.6	62.1	64.0	66.1	65.4
56	2018/05/09 10:27:25	67.2	66.6	66.4	70.0	70.4
61	2018/05/09 10:27:30	71.0	73.1	69.2	67.4	61.8
66	2018/05/09 10:27:35	59.4	58.0	56.3	57.9	58.7
71	2018/05/09 10:27:40	62.5	67.4	67.8	67.0	67.5
76	2018/05/09 10:27:45	65.0	60.8	60.8	62.8	65.5
81	2018/05/09 10:27:50	64.9	62.8	60.1	58.2	58.0
86	2018/05/09 10:27:55	59.7	67.0	66.1	64.8	57.8
91	2018/05/09 10:28:00	56.3	55.9	55.0	55.2	56.5
96	2018/05/09 10:28:05	57.2	58.4	57.4	60.0	61.1
101	2018/05/09 10:28:10	63.4	66.4	68.1	71.9	72.8
106	2018/05/09 10:28:15	73.5	69.9	68.2	65.7	65.1
111	2018/05/09 10:28:20	63.9	66.9	70.0	64.0	59.6
116	2018/05/09 10:28:25	59.3	64.6	63.8	67.6	64.3
121	2018/05/09 10:28:30	62.9	61.5	61.4	61.2	60.5
126	2018/05/09 10:28:35	61.9	60.1	59.0	58.1	59.4
131	2018/05/09 10:28:40	60.8	61.0	63.4	65.6	65.5
136	2018/05/09 10:28:45	64.1	62.5	64.9	67.4	67.2
141	2018/05/09 10:28:50	67.0	66.8	68.4	68.2	67.6
146	2018/05/09 10:28:55	68.4	70.2	69.0	66.2	65.1
151	2018/05/09 10:29:00	64.1	62.2	61.0	61.2	65.1
156	2018/05/09 10:29:05	69.1	66.6	63.8	60.1	59.0
161	2018/05/09 10:29:10	60.5	64.7	62.2	67.8	63.3
166	2018/05/09 10:29:15	64.4	63.3	63.5	65.0	64.6
171	2018/05/09 10:29:20	63.7	65.0	64.1	65.7	66.4
176	2018/05/09 10:29:25	68.7	69.2	67.2	64.7	65.6
181	2018/05/09 10:29:30	67.5	66.6	65.4	65.6	64.8
186	2018/05/09 10:29:35	62.7	62.4	63.6	66.2	68.3
191	2018/05/09 10:29:40	66.8	64.4	63.7	59.7	57.8
196	2018/05/09 10:29:45	56.2	54.7	54.1	53.6	53.1
201	2018/05/09 10:29:50	53.9	53.8	55.7	55.3	55.3
206	2018/05/09 10:29:55	55.7	57.2	58.4	58.3	59.5
211	2018/05/09 10:30:00	59.2	57.5	57.6	58.8	60.4
216	2018/05/09 10:30:05	63.5	67.8	69.0	68.0	68.2
221	2018/05/09 10:30:10	66.8	65.1	63.8	63.8	63.6
226	2018/05/09 10:30:15	63.6	61.5	62.8	63.1	63.6
231	2018/05/09 10:30:20	62.9	64.0	65.7	68.9	65.3
236	2018/05/09 10:30:25	62.1	60.5	58.5	61.1	60.2
241	2018/05/09 10:30:30	58.0	58.0	57.2	58.0	57.9
246	2018/05/09 10:30:35	59.2	58.0	58.3	60.0	63.8
251	2018/05/09 10:30:40	68.3	66.8	67.8	66.8	64.1
256	2018/05/09 10:30:45	63.6	66.8	67.9	68.3	66.0
261	2018/05/09 10:30:50	75.5	77.2	78.0	74.6	72.9
266	2018/05/09 10:30:55	71.5	69.3	69.1	70.6	69.8
271	2018/05/09 10:31:00	65.4	62.7	65.6	65.7	60.8
276	2018/05/09 10:31:05	62.8	58.1	66.5	73.2	64.2
281	2018/05/09 10:31:10	59.3	67.9	60.9	60.4	58.2
286	2018/05/09 10:31:15	55.8	55.6	55.5	56.3	57.7
291	2018/05/09 10:31:20	58.7	60.2	64.4	68.8	69.3
296	2018/05/09 10:31:25	69.5	69.1	68.0	68.2	67.1
301	2018/05/09 10:31:30	65.5	63.7	60.8	59.3	58.5
306	2018/05/09 10:31:35	58.7	59.9	64.0	63.5	66.2
311	2018/05/09 10:31:40	65.4	66.8	68.8	69.9	69.2
316	2018/05/09 10:31:45	68.8	63.6	61.2	60.5	61.0
321	2018/05/09 10:31:50	60.2	57.5	56.5	56.2	54.3
326	2018/05/09 10:31:55	55.8	58.4	59.7	60.3	60.0
331	2018/05/09 10:32:00	59.7	60.7	61.4	59.2	58.6
336	2018/05/09 10:32:05	57.4	56.9	56.0	56.7	57.4
341	2018/05/09 10:32:10	58.2	58.5	61.2	62.7	64.7
346	2018/05/09 10:32:15	67.5	68.2	69.3	69.6	69.2
351	2018/05/09 10:32:20	64.1	59.2	56.8	56.2	55.2
356	2018/05/09 10:32:25	55.4	55.8	58.0	60.2	62.1
361	2018/05/09 10:32:30	61.6	62.1	63.9	65.6	65.2
366	2018/05/09 10:32:35	63.5	61.2	57.7	55.7	56.0
371	2018/05/09 10:32:40	56.9	58.0	59.6	60.1	60.3
376	2018/05/09 10:32:45	61.3	63.5	66.4	68.7	66.4
381	2018/05/09 10:32:50	62.6	61.6	64.3	65.8	63.9
386	2018/05/09 10:32:55	61.6	60.4	59.2	58.6	57.3
391	2018/05/09 10:33:00	58.4	60.0	61.4	59.9	59.2
396	2018/05/09 10:33:05	64.4	59.6	59.3	61.3	61.9
401	2018/05/09 10:33:10	61.0	60.2	57.7	57.6	59.2
406	2018/05/09 10:33:15	58.8	59.4	59.4	60.9	59.1
411	2018/05/09 10:33:20	58.9	60.8	62.3	64.3	69.1
416	2018/05/09 10:33:25	69.5	66.5	64.1	63.5	61.7
421	2018/05/09 10:33:30	61.7	64.3	66.6	67.2	66.6

426	2018/05/09	10:33:35	65.8	64.2	62.2	60.6	58.8
431	2018/05/09	10:33:40	58.3	57.3	57.3	57.6	57.9
436	2018/05/09	10:33:45	58.5	59.8	61.1	64.9	66.1
441	2018/05/09	10:33:50	66.2	65.6	66.9	67.9	66.4
446	2018/05/09	10:33:55	65.1	63.8	62.1	65.8	65.4
451	2018/05/09	10:34:00	61.9	57.2	54.4	54.4	53.7
456	2018/05/09	10:34:05	53.0	53.3	52.9	53.8	53.1
461	2018/05/09	10:34:10	53.4	57.7	62.0	62.2	63.6
466	2018/05/09	10:34:15	63.9	63.2	64.4	63.4	64.5
471	2018/05/09	10:34:20	61.5	57.1	54.9	53.8	56.5
476	2018/05/09	10:34:25	57.2	57.5	62.6	64.6	65.4
481	2018/05/09	10:34:30	63.6	60.4	57.9	56.1	53.5
486	2018/05/09	10:34:35	52.9	54.4	57.8	56.7	57.0
491	2018/05/09	10:34:40	55.9	54.9	54.8	54.4	58.1
496	2018/05/09	10:34:45	61.0	63.8	65.5	64.7	66.0
501	2018/05/09	10:34:50	66.9	68.9	68.3	65.3	65.0
506	2018/05/09	10:34:55	61.1	56.6	55.5	53.7	53.8
511	2018/05/09	10:35:00	53.8	53.9	54.1	55.7	58.4
516	2018/05/09	10:35:05	59.6	62.2	62.4	61.5	61.0
521	2018/05/09	10:35:10	60.3	60.3	64.2	66.5	68.1
526	2018/05/09	10:35:15	71.2	69.2	67.0	65.0	63.5
531	2018/05/09	10:35:20	62.3	64.1	66.6	70.9	63.5
536	2018/05/09	10:35:25	61.8	61.6	60.5	60.4	60.5
541	2018/05/09	10:35:30	59.5	57.1	58.2	60.2	62.4
546	2018/05/09	10:35:35	59.3	58.7	59.5	58.6	57.7
551	2018/05/09	10:35:40	60.7	62.2	64.8	66.2	64.4
556	2018/05/09	10:35:45	65.3	66.0	66.0	64.6	66.7
561	2018/05/09	10:35:50	68.1	66.7	64.6	61.8	64.1
566	2018/05/09	10:35:55	65.9	64.9	63.6	59.7	57.5
571	2018/05/09	10:36:00	56.2	55.2	55.6	55.5	54.2
576	2018/05/09	10:36:05	53.7	53.8	54.8	54.6	54.5
581	2018/05/09	10:36:10	56.1	56.1	54.1	56.4	59.0
586	2018/05/09	10:36:15	60.2	59.2	58.6	57.1	55.9
591	2018/05/09	10:36:20	54.9	56.5	56.3	59.8	55.4
596	2018/05/09	10:36:25	55.4	56.2	58.4	60.9	62.0
601	2018/05/09	10:36:30	61.4	61.9	66.3	69.2	68.7
606	2018/05/09	10:36:35	68.7	71.6	71.3	67.6	66.5
611	2018/05/09	10:36:40	67.4	65.8	64.2	62.1	61.6
616	2018/05/09	10:36:45	61.5	61.3	60.3	60.7	60.2
621	2018/05/09	10:36:50	61.4	63.8	64.0	63.0	63.3
626	2018/05/09	10:36:55	62.0	60.4	60.2	62.9	62.0
631	2018/05/09	10:37:00	60.9	60.1	62.0	61.0	57.7
636	2018/05/09	10:37:05	58.1	58.4	58.4	60.1	62.0
641	2018/05/09	10:37:10	62.8	64.0	63.4	60.2	61.3
646	2018/05/09	10:37:15	62.2	61.7	63.8	65.2	63.6
651	2018/05/09	10:37:20	65.5	60.2	58.8	59.8	60.4
656	2018/05/09	10:37:25	61.1	63.6	64.9	66.3	66.0
661	2018/05/09	10:37:30	65.3	64.5	63.8	63.5	61.3
666	2018/05/09	10:37:35	57.5	55.2	53.7	54.6	54.1
671	2018/05/09	10:37:40	54.0	54.7	54.2	53.6	53.6
676	2018/05/09	10:37:45	56.4	56.9	56.8	57.6	57.2
681	2018/05/09	10:37:50	56.0	56.3	57.9	60.4	62.5
686	2018/05/09	10:37:55	64.5	68.5	73.3	72.6	66.0
691	2018/05/09	10:38:00	62.8	61.5	62.6	62.4	63.8
696	2018/05/09	10:38:05	64.9	64.8	65.5	68.0	69.6
701	2018/05/09	10:38:10	67.9	65.7	63.3	60.5	59.4
706	2018/05/09	10:38:15	58.5	57.8	57.7	58.2	59.4
711	2018/05/09	10:38:20	61.1	62.1	62.9	62.0	59.5
716	2018/05/09	10:38:25	58.0	57.7	58.7	60.0	63.4
721	2018/05/09	10:38:30	67.4	66.4	65.5	66.5	65.1
726	2018/05/09	10:38:35	63.2	60.2	56.9	56.6	56.1
731	2018/05/09	10:38:40	56.5	57.2	57.7	58.6	60.6
736	2018/05/09	10:38:45	61.9	63.6	62.1	61.8	61.4
741	2018/05/09	10:38:50	61.6	64.4	66.2	67.9	66.2
746	2018/05/09	10:38:55	63.5	62.5	62.5	63.1	64.6
751	2018/05/09	10:39:00	65.5	65.1	65.6	70.5	77.0
756	2018/05/09	10:39:05	76.1	68.3	67.4	66.2	67.0
761	2018/05/09	10:39:10	66.4	66.3	66.9	67.9	67.2
766	2018/05/09	10:39:15	62.8	62.4	61.9	59.5	57.6
771	2018/05/09	10:39:20	58.6	59.3	60.6	60.4	59.4
776	2018/05/09	10:39:25	61.6	64.3	65.3	64.8	64.4
781	2018/05/09	10:39:30	64.1	64.7	66.3	66.5	66.3
786	2018/05/09	10:39:35	65.9	66.3	65.7	64.3	64.3
791	2018/05/09	10:39:40	61.4	59.8	62.2	62.7	61.9
796	2018/05/09	10:39:45	61.3	62.8	62.2	62.9	62.9
801	2018/05/09	10:39:50	63.4	65.5	68.1	68.3	66.8
806	2018/05/09	10:39:55	67.1	64.6	62.0	61.4	60.3
811	2018/05/09	10:40:00	60.0	60.3	62.8	62.7	62.3
816	2018/05/09	10:40:05	63.6	62.4	63.1	63.7	64.2
821	2018/05/09	10:40:10	65.7	61.8	61.0	61.0	63.7
826	2018/05/09	10:40:15	64.0	63.1	63.7	65.2	66.3
831	2018/05/09	10:40:20	66.3	64.9	66.1	63.9	64.4
836	2018/05/09	10:40:25	61.9	60.9	59.0	60.4	59.6
841	2018/05/09	10:40:30	57.7	56.9	56.9	57.3	57.3
846	2018/05/09	10:40:35	58.7	58.4	61.0	61.6	63.2
851	2018/05/09	10:40:40	65.5	66.6	70.3	69.7	66.9
856	2018/05/09	10:40:45	64.0	66.3	69.1	68.1	65.4
861	2018/05/09	10:40:50	62.6	60.0	58.8	57.3	58.0
866	2018/05/09	10:40:55	57.3	66.6	57.6	59.2	61.8
871	2018/05/09	10:41:00	62.3	64.3	62.4	62.0	61.4
876	2018/05/09	10:41:05	62.1	64.8	65.6	65.2	63.6
881	2018/05/09	10:41:10	63.8	64.1	65.3	64.0	63.4
886	2018/05/09	10:41:15	63.9	63.7	64.7	66.0	67.5
891	2018/05/09	10:41:20	68.2	67.7	68.0	66.3	69.1
896	2018/05/09	10:41:25	69.2	67.2	65.3	66.0	64.9

- Freq Weight : A
- Time Weight : FAST
- Level Range : 40-100
- Max dB : 72.6 - 2018/05/09 11:02:38
- Level Range : 40-100
- SEL : 90.2
- Leq : 60.7
-

No.s	Date Time	(dB)				
1	2018/05/09 10:56:42	63.2	60.2	58.8	59.0	58.8
6	2018/05/09 10:56:47	58.2	58.5	60.0	59.9	63.6
11	2018/05/09 10:56:52	62.5	63.0	62.1	62.5	62.7
16	2018/05/09 10:56:57	62.4	63.5	62.7	63.2	63.3
21	2018/05/09 10:57:02	63.2	62.5	63.1	63.6	62.8
26	2018/05/09 10:57:07	61.9	61.0	65.0	64.6	63.4
31	2018/05/09 10:57:12	63.1	62.5	62.0	61.4	61.0
36	2018/05/09 10:57:17	60.7	60.7	61.2	62.1	61.9
41	2018/05/09 10:57:22	63.5	64.1	64.1	62.1	62.9
46	2018/05/09 10:57:27	61.3	59.3	58.6	59.3	59.1
51	2018/05/09 10:57:32	59.0	59.0	60.7	61.7	62.0
56	2018/05/09 10:57:37	63.0	61.7	63.0	65.5	64.5
61	2018/05/09 10:57:42	61.5	60.5	59.6	59.8	60.6
66	2018/05/09 10:57:47	60.5	59.8	58.5	58.9	58.2
71	2018/05/09 10:57:52	59.3	59.0	61.7	59.2	59.4
76	2018/05/09 10:57:57	59.2	59.0	59.6	60.2	58.8
81	2018/05/09 10:58:02	58.9	58.5	60.0	59.3	59.2
86	2018/05/09 10:58:07	59.0	59.4	57.7	57.6	58.6
91	2018/05/09 10:58:12	57.9	58.8	58.9	58.6	60.3
96	2018/05/09 10:58:17	59.6	60.5	59.7	59.3	58.5
101	2018/05/09 10:58:22	58.9	59.3	60.2	61.8	63.8
106	2018/05/09 10:58:27	64.8	67.0	66.0	65.9	64.5
111	2018/05/09 10:58:32	63.2	63.0	63.0	64.3	62.7
116	2018/05/09 10:58:37	62.9	63.3	62.9	62.2	61.9
121	2018/05/09 10:58:42	61.0	61.2	60.5	60.1	59.0
126	2018/05/09 10:58:47	60.2	59.9	60.2	60.7	60.2
131	2018/05/09 10:58:52	59.0	58.0	58.4	58.2	58.1
136	2018/05/09 10:58:57	57.8	57.7	58.2	58.3	58.3
141	2018/05/09 10:59:02	58.5	58.5	58.8	58.8	59.8
146	2018/05/09 10:59:07	60.6	60.4	59.9	59.8	58.9
151	2018/05/09 10:59:12	59.8	58.9	58.4	58.2	59.8
156	2018/05/09 10:59:17	59.5	62.6	62.1	61.8	60.6
161	2018/05/09 10:59:22	60.1	60.9	60.7	62.5	61.9
166	2018/05/09 10:59:27	62.8	60.8	60.7	60.0	60.6
171	2018/05/09 10:59:32	60.1	59.8	60.6	58.3	58.6
176	2018/05/09 10:59:37	58.7	59.2	60.4	60.0	61.6
181	2018/05/09 10:59:42	62.8	61.5	59.0	59.3	60.7
186	2018/05/09 10:59:47	63.3	64.2	62.6	60.9	61.9
191	2018/05/09 10:59:52	60.8	61.0	60.1	61.9	62.2
196	2018/05/09 10:59:57	62.6	62.0	62.5	63.6	62.6
201	2018/05/09 11:00:02	63.2	63.2	62.2	60.3	59.8
206	2018/05/09 11:00:07	58.8	59.0	58.8	59.0	59.2
211	2018/05/09 11:00:12	58.6	57.9	58.0	58.0	57.8
216	2018/05/09 11:00:17	57.3	57.5	57.8	58.5	58.6
221	2018/05/09 11:00:22	59.5	59.0	59.6	59.7	62.3
226	2018/05/09 11:00:27	61.7	61.6	59.3	58.0	58.4
231	2018/05/09 11:00:32	57.6	59.4	58.9	60.0	61.6
236	2018/05/09 11:00:37	64.1	64.6	64.9	61.6	60.7
241	2018/05/09 11:00:42	59.8	59.1	60.1	60.0	59.0
246	2018/05/09 11:00:47	59.1	59.9	58.8	57.9	60.5
251	2018/05/09 11:00:52	60.8	62.6	60.5	58.9	58.1
256	2018/05/09 11:00:57	56.6	57.0	57.3	57.5	57.8
261	2018/05/09 11:01:02	58.3	57.4	58.3	59.1	60.9
266	2018/05/09 11:01:07	60.9	61.7	60.7	62.0	62.4
271	2018/05/09 11:01:12	61.8	61.5	61.3	62.7	68.5
276	2018/05/09 11:01:17	64.1	62.1	64.2	64.1	62.3
281	2018/05/09 11:01:22	63.2	62.9	62.2	62.4	61.1
286	2018/05/09 11:01:27	61.0	59.8	59.6	60.3	59.6
291	2018/05/09 11:01:32	59.9	60.0	60.0	61.1	60.3
296	2018/05/09 11:01:37	58.8	58.3	58.9	58.1	59.1
301	2018/05/09 11:01:42	59.1	59.4	59.0	59.4	59.1
306	2018/05/09 11:01:47	59.1	59.2	59.5	60.1	60.3
311	2018/05/09 11:01:52	61.1	61.5	60.8	60.8	60.7
316	2018/05/09 11:01:57	61.3	61.6	62.0	61.8	61.4
321	2018/05/09 11:02:02	61.6	61.3	61.3	60.7	61.5
326	2018/05/09 11:02:07	61.4	62.7	60.1	58.6	60.1
331	2018/05/09 11:02:12	60.6	59.3	60.1	60.1	59.6
336	2018/05/09 11:02:17	60.4	61.7	62.8	61.0	60.1
341	2018/05/09 11:02:22	58.9	57.8	57.6	57.8	59.2
346	2018/05/09 11:02:27	58.0	58.5	59.4	59.7	60.0
351	2018/05/09 11:02:32	61.1	63.9	63.4	61.5	62.8
356	2018/05/09 11:02:37	64.4	68.6	63.6	63.0	61.4
361	2018/05/09 11:02:42	61.6	62.2	62.5	62.9	62.5
366	2018/05/09 11:02:47	63.7	63.9	62.9	63.8	62.2
371	2018/05/09 11:02:52	61.4	61.8	63.6	62.1	62.2
376	2018/05/09 11:02:57	60.4	60.0	61.1	59.7	58.9
381	2018/05/09 11:03:02	58.4	59.4	60.6	62.2	62.6
386	2018/05/09 11:03:07	61.0	59.3	59.1	59.9	59.0
391	2018/05/09 11:03:12	58.5	59.1	57.8	57.2	56.8
396	2018/05/09 11:03:17	57.7	57.4	58.1	56.9	56.7
401	2018/05/09 11:03:22	56.8	57.1	57.0	56.6	55.9
406	2018/05/09 11:03:27	57.1	58.1	58.7	58.2	60.5
411	2018/05/09 11:03:32	60.7	61.8	60.6	61.2	61.0
416	2018/05/09 11:03:37	62.9	62.8	66.4	63.8	62.7
421	2018/05/09 11:03:42	63.2	63.3	65.0	63.3	62.3

426	2018/05/09	11:03:47	61.3	60.5	65.6	65.8	63.2
431	2018/05/09	11:03:52	60.5	61.2	62.3	62.2	62.3
436	2018/05/09	11:03:57	62.5	60.8	59.4	61.1	62.0
441	2018/05/09	11:04:02	62.7	59.2	59.2	59.3	59.3
446	2018/05/09	11:04:07	59.6	60.5	63.1	62.2	59.8
451	2018/05/09	11:04:12	57.6	56.8	56.6	56.6	57.9
456	2018/05/09	11:04:17	57.1	57.0	57.5	57.7	57.5
461	2018/05/09	11:04:22	57.2	56.3	56.2	56.9	56.3
466	2018/05/09	11:04:27	56.2	56.1	55.8	56.0	55.3
471	2018/05/09	11:04:32	56.6	56.1	56.9	57.0	55.6
476	2018/05/09	11:04:37	56.7	56.6	56.3	55.8	56.1
481	2018/05/09	11:04:42	55.3	55.5	55.2	55.4	56.8
486	2018/05/09	11:04:47	57.0	57.9	59.6	60.2	61.1
491	2018/05/09	11:04:52	60.3	61.0	59.0	60.5	61.9
496	2018/05/09	11:04:57	60.8	60.9	60.3	60.7	58.9
501	2018/05/09	11:05:02	59.7	61.1	61.0	62.2	62.6
506	2018/05/09	11:05:07	62.6	61.1	60.7	62.5	62.9
511	2018/05/09	11:05:12	63.1	60.7	60.1	59.0	59.1
516	2018/05/09	11:05:17	61.5	62.1	63.7	63.6	63.8
521	2018/05/09	11:05:22	64.7	63.0	62.9	63.7	62.4
526	2018/05/09	11:05:27	63.0	66.3	66.2	62.6	62.8
531	2018/05/09	11:05:32	60.3	59.9	61.6	62.2	63.5
536	2018/05/09	11:05:37	64.0	62.2	62.1	63.0	60.2
541	2018/05/09	11:05:42	59.6	59.1	58.9	58.6	57.7
546	2018/05/09	11:05:47	58.6	58.2	58.2	58.1	57.7
551	2018/05/09	11:05:52	57.7	56.2	56.4	56.9	57.5
556	2018/05/09	11:05:57	57.5	58.1	61.4	59.4	58.9
561	2018/05/09	11:06:02	56.6	56.4	56.9	58.3	58.7
566	2018/05/09	11:06:07	57.2	58.4	58.0	59.1	59.1
571	2018/05/09	11:06:12	58.7	57.6	58.6	57.7	59.9
576	2018/05/09	11:06:17	58.3	59.0	60.4	62.3	63.8
581	2018/05/09	11:06:22	63.2	62.5	61.6	61.3	61.5
586	2018/05/09	11:06:27	62.1	64.2	64.3	65.0	64.5
591	2018/05/09	11:06:32	63.9	61.8	62.0	62.8	61.7
596	2018/05/09	11:06:37	62.4	62.8	62.8	62.2	62.1
601	2018/05/09	11:06:42	63.4	62.7	62.5	61.3	61.4
606	2018/05/09	11:06:47	60.6	60.7	61.5	61.2	61.0
611	2018/05/09	11:06:52	61.0	62.3	61.6	61.3	62.9
616	2018/05/09	11:06:57	62.5	61.1	60.4	62.8	59.6
621	2018/05/09	11:07:02	59.4	59.6	58.7	57.3	56.8
626	2018/05/09	11:07:07	56.7	56.1	55.2	56.2	56.7
631	2018/05/09	11:07:12	56.7	59.8	57.6	58.0	57.0
636	2018/05/09	11:07:17	57.0	57.8	58.1	57.1	57.6
641	2018/05/09	11:07:22	55.9	56.7	56.2	56.6	57.1
646	2018/05/09	11:07:27	56.6	56.2	56.8	56.2	56.0
651	2018/05/09	11:07:32	56.7	57.3	57.7	58.6	57.7
656	2018/05/09	11:07:37	56.9	56.4	55.6	56.9	57.7
661	2018/05/09	11:07:42	58.4	58.1	62.1	60.2	62.3
666	2018/05/09	11:07:47	62.0	60.9	63.8	64.8	63.2
671	2018/05/09	11:07:52	63.4	63.3	64.4	64.9	65.7
676	2018/05/09	11:07:57	64.0	63.6	61.5	61.2	58.9
681	2018/05/09	11:08:02	59.7	59.1	59.5	66.0	60.3
686	2018/05/09	11:08:07	59.4	59.5	59.4	58.7	58.8
691	2018/05/09	11:08:12	57.6	58.3	57.9	57.1	57.4
696	2018/05/09	11:08:17	56.7	57.2	57.1	57.4	57.2
701	2018/05/09	11:08:22	58.0	57.4	57.7	57.1	56.7
706	2018/05/09	11:08:27	58.0	58.9	60.0	59.4	58.3
711	2018/05/09	11:08:32	57.2	57.0	57.4	60.0	61.0
716	2018/05/09	11:08:37	61.2	60.1	58.8	58.9	58.3
721	2018/05/09	11:08:42	59.2	59.5	59.2	59.4	58.5
726	2018/05/09	11:08:47	58.4	58.1	59.4	58.8	60.3
731	2018/05/09	11:08:52	59.4	59.1	61.7	61.0	61.0
736	2018/05/09	11:08:57	57.6	57.7	57.4	57.1	56.9
741	2018/05/09	11:09:02	57.0	57.1	57.0	57.8	60.0
746	2018/05/09	11:09:07	58.9	58.0	58.2	59.7	58.7
751	2018/05/09	11:09:12	59.0	63.9	63.8	60.3	59.8
756	2018/05/09	11:09:17	59.5	60.7	62.2	60.0	59.6
761	2018/05/09	11:09:22	58.5	57.9	59.1	59.3	59.8
766	2018/05/09	11:09:27	60.1	60.1	60.4	60.8	60.7
771	2018/05/09	11:09:32	60.8	61.2	62.4	64.1	63.1
776	2018/05/09	11:09:37	60.4	60.2	59.3	59.4	59.4
781	2018/05/09	11:09:42	59.8	60.0	60.0	60.1	59.2
786	2018/05/09	11:09:47	59.2	59.7	60.1	60.3	60.4
791	2018/05/09	11:09:52	61.5	62.4	64.6	63.7	61.5
796	2018/05/09	11:09:57	59.8	59.2	63.8	62.8	62.5
801	2018/05/09	11:10:02	60.7	62.2	62.5	60.1	57.4
806	2018/05/09	11:10:07	57.5	57.0	56.8	56.8	57.5
811	2018/05/09	11:10:12	57.0	58.1	57.6	58.5	58.9
816	2018/05/09	11:10:17	59.0	59.7	59.3	57.2	57.4
821	2018/05/09	11:10:22	58.6	56.8	57.8	58.1	58.6
826	2018/05/09	11:10:27	58.9	59.2	59.6	57.9	57.4
831	2018/05/09	11:10:32	57.3	58.1	57.6	57.1	57.9
836	2018/05/09	11:10:37	57.0	56.8	57.6	56.7	56.4
841	2018/05/09	11:10:42	56.0	56.0	55.6	56.8	57.8
846	2018/05/09	11:10:47	58.1	59.9	60.0	61.5	62.4
851	2018/05/09	11:10:52	62.5	63.6	62.9	62.5	62.2
856	2018/05/09	11:10:57	61.5	61.0	59.9	59.6	59.0
861	2018/05/09	11:11:02	58.1	58.3	57.2	57.2	58.2
866	2018/05/09	11:11:07	58.7	58.4	58.6	59.0	59.1
871	2018/05/09	11:11:12	58.1	56.5	57.0	57.5	56.9
876	2018/05/09	11:11:17	56.1	55.8	56.2	57.0	57.3
881	2018/05/09	11:11:22	59.1	59.5	60.4	63.0	63.1
886	2018/05/09	11:11:27	60.3	60.4	60.0	59.1	58.3
891	2018/05/09	11:11:32	57.3	56.6	57.4	57.4	56.8
896	2018/05/09	11:11:37	57.4	57.7	58.8	60.0	59.5

- Freq Weight : A
- Time Weight : FAST
- Level Range : 40-100
- Max dB : 83.9 - 2018/05/09 11:34:15
- Level Range : 40-100
- SEL : 97.1
- Leq : 67.6
-

No.s	Date Time	(dB)				
1	2018/05/09 11:26:20	55.7	52.7	57.8	50.0	50.8
6	2018/05/09 11:26:25	51.2	49.1	48.4	50.7	50.1
11	2018/05/09 11:26:30	49.5	49.4	50.7	49.1	49.8
16	2018/05/09 11:26:35	49.8	50.5	52.0	50.7	49.7
21	2018/05/09 11:26:40	54.8	56.7	54.6	55.8	60.2
26	2018/05/09 11:26:45	61.6	63.9	63.6	66.5	65.7
31	2018/05/09 11:26:50	67.1	69.8	69.3	72.2	69.3
36	2018/05/09 11:26:55	67.6	67.0	65.6	59.4	58.8
41	2018/05/09 11:27:00	58.9	59.2	58.5	58.7	63.3
46	2018/05/09 11:27:05	67.1	69.3	69.5	70.3	71.3
51	2018/05/09 11:27:10	68.8	66.4	67.3	64.4	58.3
56	2018/05/09 11:27:15	59.4	57.3	56.8	59.6	67.4
61	2018/05/09 11:27:20	69.5	64.7	60.8	55.0	52.1
66	2018/05/09 11:27:25	51.4	50.6	51.0	51.9	50.9
71	2018/05/09 11:27:30	49.3	49.1	50.1	52.4	52.5
76	2018/05/09 11:27:35	55.0	58.5	61.8	65.0	67.5
81	2018/05/09 11:27:40	67.6	66.5	67.6	70.1	68.6
86	2018/05/09 11:27:45	70.9	69.6	67.2	65.1	62.8
91	2018/05/09 11:27:50	63.9	63.6	62.2	62.8	64.2
96	2018/05/09 11:27:55	63.0	62.1	64.1	66.5	66.0
101	2018/05/09 11:28:00	67.3	70.5	72.3	69.5	70.4
106	2018/05/09 11:28:05	69.1	69.7	69.5	66.6	61.7
111	2018/05/09 11:28:10	59.5	57.1	54.8	54.1	52.7
116	2018/05/09 11:28:15	50.5	49.4	49.8	48.2	48.9
121	2018/05/09 11:28:20	49.5	49.9	51.1	52.9	53.5
126	2018/05/09 11:28:25	52.1	51.6	51.3	50.1	49.7
131	2018/05/09 11:28:30	50.0	50.8	54.3	55.8	60.5
136	2018/05/09 11:28:35	68.2	70.1	68.1	61.1	58.4
141	2018/05/09 11:28:40	62.5	64.1	65.4	62.8	59.9
146	2018/05/09 11:28:45	57.0	56.3	54.7	56.4	60.8
151	2018/05/09 11:28:50	63.5	67.7	71.2	70.0	69.7
156	2018/05/09 11:28:55	68.4	63.7	61.5	55.0	56.5
161	2018/05/09 11:29:00	56.4	59.8	58.9	61.9	68.2
166	2018/05/09 11:29:05	71.5	70.0	67.9	62.8	60.0
171	2018/05/09 11:29:10	58.5	56.1	57.5	57.8	53.0
176	2018/05/09 11:29:15	54.5	54.3	53.0	51.0	49.8
181	2018/05/09 11:29:20	50.0	52.6	57.5	53.7	54.5
186	2018/05/09 11:29:25	55.0	55.1	56.8	60.5	63.2
191	2018/05/09 11:29:30	68.5	71.7	75.2	74.6	72.8
196	2018/05/09 11:29:35	72.1	69.6	67.4	65.0	63.2
201	2018/05/09 11:29:40	60.3	60.8	62.4	62.4	63.5
206	2018/05/09 11:29:45	64.9	61.8	62.9	63.2	68.1
211	2018/05/09 11:29:50	70.0	72.2	72.0	70.0	62.7
216	2018/05/09 11:29:55	62.6	64.0	65.8	67.4	66.7
221	2018/05/09 11:30:00	65.9	65.7	61.6	58.3	58.3
226	2018/05/09 11:30:05	57.0	55.8	56.4	53.5	52.1
231	2018/05/09 11:30:10	51.5	52.7	53.3	53.8	54.9
236	2018/05/09 11:30:15	57.8	61.3	64.2	66.7	64.1
241	2018/05/09 11:30:20	61.6	56.8	53.4	49.8	48.7
246	2018/05/09 11:30:25	48.2	49.9	48.4	52.0	49.3
251	2018/05/09 11:30:30	48.6	47.5	48.1	51.1	52.5
256	2018/05/09 11:30:35	53.8	57.4	60.1	64.5	66.0
261	2018/05/09 11:30:40	66.8	66.3	68.6	65.9	64.9
266	2018/05/09 11:30:45	65.3	68.9	68.2	70.0	68.7
271	2018/05/09 11:30:50	66.3	65.2	67.5	71.7	70.6
276	2018/05/09 11:30:55	70.7	67.0	61.5	61.2	58.6
281	2018/05/09 11:31:00	59.9	62.7	65.2	70.0	74.6
286	2018/05/09 11:31:05	77.1	70.3	67.6	67.5	69.5
291	2018/05/09 11:31:10	70.1	69.6	67.9	65.0	64.8
296	2018/05/09 11:31:15	64.9	66.9	66.6	66.6	65.7
301	2018/05/09 11:31:20	63.8	63.6	62.1	59.9	62.8
306	2018/05/09 11:31:25	64.2	67.8	65.5	64.3	66.9
311	2018/05/09 11:31:30	61.5	58.5	57.1	55.5	58.7
316	2018/05/09 11:31:35	60.4	60.2	63.8	61.0	55.0
321	2018/05/09 11:31:40	55.4	55.2	55.7	58.2	64.0
326	2018/05/09 11:31:45	68.3	71.0	66.6	62.3	56.1
331	2018/05/09 11:31:50	53.0	52.4	53.1	54.1	55.8
336	2018/05/09 11:31:55	59.0	63.9	67.2	67.5	66.4
341	2018/05/09 11:32:00	62.8	63.0	64.6	69.4	67.7
346	2018/05/09 11:32:05	66.6	68.0	67.9	69.8	68.7
351	2018/05/09 11:32:10	70.5	71.9	69.0	66.0	64.5
356	2018/05/09 11:32:15	65.1	64.9	64.5	63.4	68.5
361	2018/05/09 11:32:20	68.8	70.7	70.7	68.3	66.5
366	2018/05/09 11:32:25	64.4	64.8	66.0	58.8	56.5
371	2018/05/09 11:32:30	53.9	50.3	49.7	57.0	50.0
376	2018/05/09 11:32:35	51.5	53.0	55.6	61.8	63.0
381	2018/05/09 11:32:40	63.7	65.4	63.1	66.9	69.2
386	2018/05/09 11:32:45	67.9	65.5	64.2	62.4	64.2
391	2018/05/09 11:32:50	67.2	64.5	61.5	63.8	66.5
396	2018/05/09 11:32:55	65.4	61.5	56.3	55.0	57.8
401	2018/05/09 11:33:00	64.1	67.0	64.9	60.2	55.7
406	2018/05/09 11:33:05	52.0	52.2	55.1	57.8	60.3
411	2018/05/09 11:33:10	67.2	69.2	67.1	64.6	66.1
416	2018/05/09 11:33:15	64.0	62.3	63.5	64.0	64.0
421	2018/05/09 11:33:20	62.6	63.5	65.3	65.5	64.9

426	2018/05/09	11:33:25	65.8	68.2	70.5	72.0	73.7
431	2018/05/09	11:33:30	76.0	76.5	75.6	73.0	68.0
436	2018/05/09	11:33:35	66.3	63.4	62.1	63.8	69.3
441	2018/05/09	11:33:40	73.0	71.0	68.3	61.6	59.3
446	2018/05/09	11:33:45	61.0	65.2	71.6	70.7	66.8
451	2018/05/09	11:33:50	63.3	64.4	65.0	67.5	64.3
456	2018/05/09	11:33:55	63.8	63.7	65.9	60.5	58.1
461	2018/05/09	11:34:00	62.6	65.8	71.7	75.3	72.8
466	2018/05/09	11:34:05	71.0	70.0	74.5	76.6	78.6
471	2018/05/09	11:34:10	80.5	80.2	82.7	81.9	83.7
476	2018/05/09	11:34:15	82.2	80.7	74.8	71.6	67.8
481	2018/05/09	11:34:20	66.6	64.3	61.9	60.8	59.0
486	2018/05/09	11:34:25	56.6	55.0	54.4	54.4	53.0
491	2018/05/09	11:34:30	51.3	50.7	50.1	48.9	49.4
496	2018/05/09	11:34:35	49.7	52.7	51.4	52.3	53.9
501	2018/05/09	11:34:40	51.2	53.7	56.8	57.3	61.4
506	2018/05/09	11:34:45	63.8	67.7	71.3	71.4	70.6
511	2018/05/09	11:34:50	71.4	71.3	67.8	64.3	66.5
516	2018/05/09	11:34:55	66.0	70.9	71.4	67.3	63.8
521	2018/05/09	11:35:00	65.8	67.4	69.0	66.0	62.7
526	2018/05/09	11:35:05	64.0	67.4	69.6	69.7	70.9
531	2018/05/09	11:35:10	71.2	73.0	70.8	69.2	72.5
536	2018/05/09	11:35:15	73.9	71.1	66.1	59.2	58.0
541	2018/05/09	11:35:20	57.1	59.1	62.3	65.4	68.5
546	2018/05/09	11:35:25	69.2	69.6	63.5	58.8	56.2
551	2018/05/09	11:35:30	52.8	51.8	52.3	54.3	56.3
556	2018/05/09	11:35:35	61.7	64.8	66.5	63.9	61.9
561	2018/05/09	11:35:40	62.9	64.2	66.6	68.6	64.0
566	2018/05/09	11:35:45	65.8	67.2	69.2	70.1	68.1
571	2018/05/09	11:35:50	69.2	69.0	70.5	73.1	72.3
576	2018/05/09	11:35:55	69.1	61.6	59.7	55.7	53.7
581	2018/05/09	11:36:00	53.0	51.2	50.8	51.3	53.0
586	2018/05/09	11:36:05	55.2	55.1	56.6	56.6	54.2
591	2018/05/09	11:36:10	55.1	57.3	61.9	66.4	67.7
596	2018/05/09	11:36:15	64.3	58.9	58.2	60.4	65.7
601	2018/05/09	11:36:20	70.5	67.0	62.9	58.7	58.0
606	2018/05/09	11:36:25	56.9	60.4	65.3	68.0	69.8
611	2018/05/09	11:36:30	70.5	72.4	71.3	67.7	65.9
616	2018/05/09	11:36:35	69.2	70.9	71.2	76.1	74.4
621	2018/05/09	11:36:40	67.2	61.8	61.3	60.6	63.5
626	2018/05/09	11:36:45	67.6	70.5	69.1	63.2	59.2
631	2018/05/09	11:36:50	54.8	55.0	55.0	56.5	57.9
636	2018/05/09	11:36:55	62.9	69.1	72.1	69.8	65.2
641	2018/05/09	11:37:00	65.8	66.4	64.5	60.1	56.1
646	2018/05/09	11:37:05	57.0	58.7	60.4	67.5	70.3
651	2018/05/09	11:37:10	74.6	70.3	63.0	63.1	66.8
656	2018/05/09	11:37:15	69.2	64.0	58.6	57.9	61.3
661	2018/05/09	11:37:20	66.2	68.5	74.1	73.9	68.4
666	2018/05/09	11:37:25	63.4	68.3	71.8	69.3	70.8
671	2018/05/09	11:37:30	73.2	67.1	71.0	67.6	67.0
676	2018/05/09	11:37:35	65.6	65.3	61.8	62.6	63.9
681	2018/05/09	11:37:40	67.3	70.0	69.3	67.1	69.4
686	2018/05/09	11:37:45	70.7	69.7	67.3	62.1	60.4
691	2018/05/09	11:37:50	57.4	57.8	61.8	63.5	64.8
696	2018/05/09	11:37:55	64.3	68.2	67.1	67.1	66.6
701	2018/05/09	11:38:00	59.9	57.9	55.4	55.5	56.6
706	2018/05/09	11:38:05	57.2	63.2	68.1	68.5	63.9
711	2018/05/09	11:38:10	59.2	54.1	52.4	49.9	54.4
716	2018/05/09	11:38:15	52.8	56.4	59.1	61.7	65.2
721	2018/05/09	11:38:20	69.8	71.3	67.7	61.4	57.7
726	2018/05/09	11:38:25	57.1	55.0	54.3	51.9	54.2
731	2018/05/09	11:38:30	54.0	54.1	55.2	59.5	67.2
736	2018/05/09	11:38:35	70.3	67.5	62.4	57.9	54.2
741	2018/05/09	11:38:40	55.0	58.9	61.6	66.9	67.5
746	2018/05/09	11:38:45	69.7	66.6	65.6	65.3	66.3
751	2018/05/09	11:38:50	59.2	60.3	60.1	63.8	65.7
756	2018/05/09	11:38:55	66.9	67.3	59.6	59.4	56.6
761	2018/05/09	11:39:00	56.4	58.5	60.3	66.8	71.4
766	2018/05/09	11:39:05	69.9	64.6	58.4	54.6	52.7
771	2018/05/09	11:39:10	51.9	52.6	53.7	54.8	58.8
776	2018/05/09	11:39:15	59.8	63.9	65.2	68.5	63.7
781	2018/05/09	11:39:20	58.8	56.2	56.2	56.9	57.0
786	2018/05/09	11:39:25	58.2	64.2	68.6	67.1	63.1
791	2018/05/09	11:39:30	57.9	52.9	53.1	54.5	53.8
796	2018/05/09	11:39:35	55.7	58.7	62.6	68.5	69.0
801	2018/05/09	11:39:40	66.6	66.9	69.2	65.1	60.8
806	2018/05/09	11:39:45	56.0	53.4	57.3	57.8	62.3
811	2018/05/09	11:39:50	69.1	72.7	69.4	62.0	54.8
816	2018/05/09	11:39:55	51.0	49.1	47.5	45.8	48.8
821	2018/05/09	11:40:00	52.1	50.0	56.7	53.9	56.4
826	2018/05/09	11:40:05	59.6	62.3	65.6	66.2	66.0
831	2018/05/09	11:40:10	66.4	68.1	68.5	69.5	69.4
836	2018/05/09	11:40:15	69.8	69.3	67.6	68.1	64.8
841	2018/05/09	11:40:20	65.7	64.6	60.3	56.8	54.7
846	2018/05/09	11:40:25	52.7	52.6	52.4	55.3	58.6
851	2018/05/09	11:40:30	59.8	65.7	68.8	71.4	67.5
856	2018/05/09	11:40:35	66.1	67.8	67.1	65.3	64.3
861	2018/05/09	11:40:40	64.6	62.6	65.1	71.8	73.5
866	2018/05/09	11:40:45	68.4	62.3	57.6	56.7	55.1
871	2018/05/09	11:40:50	54.7	53.7	52.7	53.0	52.6
876	2018/05/09	11:40:55	53.2	56.2	58.3	61.3	66.2
881	2018/05/09	11:41:00	71.7	77.8	75.1	78.6	81.5
886	2018/05/09	11:41:05	79.3	73.3	69.3	64.3	62.3
891	2018/05/09	11:41:10	61.2	61.9	59.6	58.8	59.3
896	2018/05/09	11:41:15	66.8	70.6	71.3	71.6	68.8

Noise Measurement 7

- Freq Weight : A
- Time Weight : SLOW
- Level Range : 40-100
- Max dB : 84.2 - 2018/05/09 16:59:19
- Level Range : 40-100
- SEL : 93.6
- Leq : 64.1
-

No.s	Date Time	(dB)				
1	2018/05/09 16:51:45	72.1	68.1	64.7	62.3	60.8
6	2018/05/09 16:51:50	62.5	65.0	66.2	63.8	63.5
11	2018/05/09 16:51:55	63.9	62.8	60.7	59.7	58.4
16	2018/05/09 16:52:00	60.1	63.4	62.9	61.7	61.6
21	2018/05/09 16:52:05	60.6	59.5	59.0	59.4	60.4
26	2018/05/09 16:52:10	61.7	62.4	63.9	64.4	63.4
31	2018/05/09 16:52:15	62.8	61.8	60.4	59.7	60.1
36	2018/05/09 16:52:20	59.7	60.5	59.4	58.7	57.6
41	2018/05/09 16:52:25	57.0	56.8	56.1	55.9	55.5
46	2018/05/09 16:52:30	56.0	58.5	61.8	63.6	62.5
51	2018/05/09 16:52:35	61.0	62.1	61.8	61.0	59.8
56	2018/05/09 16:52:40	59.3	59.1	60.4	59.9	59.6
61	2018/05/09 16:52:45	58.3	57.4	56.7	56.7	56.3
66	2018/05/09 16:52:50	55.8	55.1	55.3	55.8	57.0
71	2018/05/09 16:52:55	57.9	59.9	61.3	61.4	64.0
76	2018/05/09 16:53:00	67.3	68.1	66.9	66.2	66.9
81	2018/05/09 16:53:05	71.1	73.4	71.7	68.6	66.7
86	2018/05/09 16:53:10	65.2	62.6	61.1	59.4	57.7
91	2018/05/09 16:53:15	56.9	57.2	62.0	65.2	65.3
96	2018/05/09 16:53:20	63.7	64.8	67.8	67.7	65.3
101	2018/05/09 16:53:25	63.6	63.9	64.2	64.4	62.4
106	2018/05/09 16:53:30	61.2	60.5	59.5	59.0	59.7
111	2018/05/09 16:53:35	61.1	62.5	62.6	61.3	60.8
116	2018/05/09 16:53:40	60.5	59.3	57.3	56.6	56.6
121	2018/05/09 16:53:45	56.9	58.2	57.1	56.2	56.0
126	2018/05/09 16:53:50	56.1	56.5	57.6	61.6	66.4
131	2018/05/09 16:53:55	66.4	66.0	64.6	64.0	62.3
136	2018/05/09 16:54:00	60.9	59.5	61.6	65.6	66.3
141	2018/05/09 16:54:05	63.9	62.8	63.0	61.5	60.6
146	2018/05/09 16:54:10	59.0	57.8	56.6	56.7	56.8
151	2018/05/09 16:54:15	57.6	57.5	58.7	59.4	59.7
156	2018/05/09 16:54:20	62.0	64.6	67.5	66.6	65.7
161	2018/05/09 16:54:25	64.3	63.7	61.9	60.5	59.6
166	2018/05/09 16:54:30	60.8	63.0	64.1	63.1	62.1
171	2018/05/09 16:54:35	63.4	62.8	62.9	62.1	60.6
176	2018/05/09 16:54:40	59.4	57.8	57.1	56.8	57.2
181	2018/05/09 16:54:45	57.6	59.7	62.1	64.5	64.7
186	2018/05/09 16:54:50	64.9	63.4	62.9	63.6	62.9
191	2018/05/09 16:54:55	60.8	59.1	57.9	56.8	56.1
196	2018/05/09 16:55:00	54.9	53.5	52.6	52.5	53.6
201	2018/05/09 16:55:05	54.3	54.2	55.6	56.7	58.4
206	2018/05/09 16:55:10	60.1	61.6	61.3	59.5	58.4
211	2018/05/09 16:55:15	58.4	58.2	57.6	57.6	57.4
216	2018/05/09 16:55:20	58.1	58.5	57.6	57.1	58.5
221	2018/05/09 16:55:25	58.5	59.9	60.8	62.4	59.6
226	2018/05/09 16:55:30	57.1	56.0	56.0	55.5	55.7
231	2018/05/09 16:55:35	56.1	55.6	56.1	57.7	63.3
236	2018/05/09 16:55:40	61.5	60.4	61.2	59.7	58.1
241	2018/05/09 16:55:45	58.6	58.3	58.5	58.8	58.3
246	2018/05/09 16:55:50	59.5	62.5	64.7	63.4	61.7
251	2018/05/09 16:55:55	61.6	62.0	60.5	59.7	60.3
256	2018/05/09 16:56:00	60.8	59.9	58.9	57.7	57.3
261	2018/05/09 16:56:05	58.1	62.6	66.6	66.6	64.8
266	2018/05/09 16:56:10	65.2	66.1	64.8	62.4	60.9
271	2018/05/09 16:56:15	60.1	59.9	59.4	61.1	61.7
276	2018/05/09 16:56:20	61.4	60.4	58.9	57.6	56.9
281	2018/05/09 16:56:25	56.8	61.1	63.3	63.2	63.5
286	2018/05/09 16:56:30	63.2	63.6	64.5	69.7	70.8
291	2018/05/09 16:56:35	71.6	69.5	67.8	64.9	62.3
296	2018/05/09 16:56:40	61.5	62.5	67.7	68.2	71.0
301	2018/05/09 16:56:45	70.6	69.6	68.4	67.0	64.8
306	2018/05/09 16:56:50	62.6	60.5	59.0	58.0	58.8
311	2018/05/09 16:56:55	61.3	62.5	63.2	62.0	63.2
316	2018/05/09 16:57:00	64.9	63.6	61.5	59.7	58.4
321	2018/05/09 16:57:05	58.1	57.7	56.1	54.6	54.0
326	2018/05/09 16:57:10	54.3	56.4	57.2	59.4	59.4
331	2018/05/09 16:57:15	58.2	57.2	55.7	54.6	54.7
336	2018/05/09 16:57:20	57.0	58.6	61.2	60.2	59.4
341	2018/05/09 16:57:25	58.6	58.5	59.8	59.5	59.0
346	2018/05/09 16:57:30	58.4	58.1	59.0	58.5	58.9
351	2018/05/09 16:57:35	58.9	60.8	60.1	62.4	64.0
356	2018/05/09 16:57:40	66.0	66.3	66.8	67.4	66.6
361	2018/05/09 16:57:45	64.5	61.9	59.3	57.3	56.8
366	2018/05/09 16:57:50	57.6	57.6	57.6	57.7	57.0
371	2018/05/09 16:57:55	56.3	56.6	57.6	59.8	62.7
376	2018/05/09 16:58:00	66.4	67.6	65.5	63.7	65.2
381	2018/05/09 16:58:05	67.7	66.9	64.7	65.1	63.8
386	2018/05/09 16:58:10	62.4	61.6	59.7	57.9	56.8
391	2018/05/09 16:58:15	55.4	55.8	55.3	54.9	56.1
396	2018/05/09 16:58:20	55.8	57.6	56.9	56.7	56.9
401	2018/05/09 16:58:25	57.6	57.5	58.8	58.5	58.1
406	2018/05/09 16:58:30	56.8	57.9	59.2	61.5	60.3
411	2018/05/09 16:58:35	58.6	57.8	61.8	65.3	71.9
416	2018/05/09 16:58:40	72.2	69.4	69.5	68.5	68.5
421	2018/05/09 16:58:45	66.5	63.9	61.6	61.4	64.3

426	2018/05/09	16:58:50	67.0	65.1	63.1	62.9	62.0
431	2018/05/09	16:58:55	60.5	58.4	57.9	58.4	58.6
436	2018/05/09	16:59:00	58.4	58.1	57.3	57.5	57.3
441	2018/05/09	16:59:05	57.8	57.5	56.9	59.8	59.2
446	2018/05/09	16:59:10	58.0	57.9	58.6	61.0	61.8
451	2018/05/09	16:59:15	65.9	72.8	73.8	81.0	83.5
456	2018/05/09	16:59:20	81.6	79.2	75.4	71.8	68.7
461	2018/05/09	16:59:25	66.3	63.5	61.6	61.1	61.0
466	2018/05/09	16:59:30	60.2	60.8	63.9	66.1	64.3
471	2018/05/09	16:59:35	63.1	63.4	62.9	61.7	60.3
476	2018/05/09	16:59:40	59.7	60.7	61.2	62.2	62.1
481	2018/05/09	16:59:45	62.9	62.9	61.1	59.0	57.7
486	2018/05/09	16:59:50	57.6	57.6	57.2	56.3	55.5
491	2018/05/09	16:59:55	56.7	56.7	58.4	59.4	58.7
496	2018/05/09	17:00:00	57.2	55.8	55.0	55.2	56.1
501	2018/05/09	17:00:05	56.7	57.4	58.2	57.7	57.8
506	2018/05/09	17:00:10	57.6	57.8	60.0	59.2	60.5
511	2018/05/09	17:00:15	60.9	63.1	62.7	61.6	61.0
516	2018/05/09	17:00:20	59.9	57.7	57.0	56.7	56.8
521	2018/05/09	17:00:25	56.9	57.6	57.2	56.5	55.5
526	2018/05/09	17:00:30	54.8	54.3	54.2	53.8	55.1
531	2018/05/09	17:00:35	57.0	57.9	59.6	61.0	60.2
536	2018/05/09	17:00:40	59.3	59.0	57.4	56.2	55.7
541	2018/05/09	17:00:45	56.5	61.4	63.1	64.3	65.2
546	2018/05/09	17:00:50	64.8	64.4	65.1	65.5	64.9
551	2018/05/09	17:00:55	63.2	62.4	61.5	59.8	58.2
556	2018/05/09	17:01:00	57.8	57.5	57.1	57.8	58.2
561	2018/05/09	17:01:05	58.3	57.5	58.4	58.5	59.9
566	2018/05/09	17:01:10	60.1	60.4	60.4	61.8	63.5
571	2018/05/09	17:01:15	64.1	64.0	63.0	63.1	61.8
576	2018/05/09	17:01:20	61.6	61.7	62.6	64.1	64.6
581	2018/05/09	17:01:25	63.3	60.7	59.0	59.1	58.3
586	2018/05/09	17:01:30	56.2	55.1	54.7	54.7	54.9
591	2018/05/09	17:01:35	56.8	61.9	67.3	67.5	64.9
596	2018/05/09	17:01:40	63.6	63.3	61.5	59.6	61.6
601	2018/05/09	17:01:45	61.8	62.4	62.4	61.7	60.8
606	2018/05/09	17:01:50	60.2	60.1	59.9	58.7	58.5
611	2018/05/09	17:01:55	58.7	59.8	59.4	58.4	57.7
616	2018/05/09	17:02:00	57.7	59.4	63.8	66.2	67.0
621	2018/05/09	17:02:05	67.4	65.1	63.8	64.6	65.7
626	2018/05/09	17:02:10	64.2	63.3	64.2	64.2	63.0
631	2018/05/09	17:02:15	61.7	60.6	60.2	58.4	58.0
636	2018/05/09	17:02:20	57.0	57.0	59.7	62.2	63.0
641	2018/05/09	17:02:25	61.8	60.2	59.9	59.3	59.1
646	2018/05/09	17:02:30	58.0	57.8	57.9	57.2	57.4
651	2018/05/09	17:02:35	59.3	64.3	67.2	65.1	63.2
656	2018/05/09	17:02:40	62.8	63.5	65.1	63.9	61.5
661	2018/05/09	17:02:45	59.9	57.6	57.8	56.6	55.6
666	2018/05/09	17:02:50	54.9	54.5	54.1	54.2	54.5
671	2018/05/09	17:02:55	54.8	55.3	58.3	61.1	61.9
676	2018/05/09	17:03:00	59.5	57.7	58.0	58.7	60.3
681	2018/05/09	17:03:05	61.8	62.8	66.9	70.4	71.5
686	2018/05/09	17:03:10	68.4	65.6	63.9	62.1	61.9
691	2018/05/09	17:03:15	62.9	64.6	63.5	64.1	67.7
696	2018/05/09	17:03:20	67.6	65.5	65.5	65.0	63.8
701	2018/05/09	17:03:25	62.1	60.5	59.5	58.8	57.8
706	2018/05/09	17:03:30	56.7	56.4	55.3	55.3	55.7
711	2018/05/09	17:03:35	56.4	57.5	58.7	59.0	58.0
716	2018/05/09	17:03:40	58.4	61.1	62.8	62.1	61.2
721	2018/05/09	17:03:45	62.4	62.5	61.1	59.5	58.4
726	2018/05/09	17:03:50	58.2	59.2	59.0	58.8	57.9
731	2018/05/09	17:03:55	58.0	58.3	58.1	57.5	57.3
736	2018/05/09	17:04:00	58.3	61.1	63.6	65.6	63.8
741	2018/05/09	17:04:05	63.7	65.7	68.8	69.1	66.8
746	2018/05/09	17:04:10	65.0	64.1	63.1	62.3	61.9
751	2018/05/09	17:04:15	61.0	60.2	58.7	58.3	58.0
756	2018/05/09	17:04:20	59.5	62.0	63.2	63.2	63.4
761	2018/05/09	17:04:25	63.7	62.2	61.3	60.5	59.8
766	2018/05/09	17:04:30	59.5	59.6	59.0	58.0	56.7
771	2018/05/09	17:04:35	55.8	55.6	57.2	58.4	58.7
776	2018/05/09	17:04:40	59.0	60.2	61.7	64.0	65.0
781	2018/05/09	17:04:45	63.1	63.0	63.7	63.3	64.9
786	2018/05/09	17:04:50	65.7	65.7	63.6	63.2	63.8
791	2018/05/09	17:04:55	64.3	64.2	64.3	65.6	69.9
796	2018/05/09	17:05:00	71.0	70.6	71.1	69.3	68.1
801	2018/05/09	17:05:05	67.0	65.9	65.2	64.6	63.1
806	2018/05/09	17:05:10	62.1	60.7	59.8	59.3	59.2
811	2018/05/09	17:05:15	59.8	58.5	57.2	57.4	57.9
816	2018/05/09	17:05:20	57.4	57.2	58.5	59.9	60.6
821	2018/05/09	17:05:25	62.2	63.0	62.4	62.5	62.0
826	2018/05/09	17:05:30	61.4	60.0	59.1	57.9	56.6
831	2018/05/09	17:05:35	56.9	58.5	60.1	59.6	57.8
836	2018/05/09	17:05:40	58.7	58.0	57.8	57.4	57.3
841	2018/05/09	17:05:45	58.6	59.0	58.9	57.7	58.8
846	2018/05/09	17:05:50	61.1	63.4	64.6	64.7	62.6
851	2018/05/09	17:05:55	60.3	59.6	59.9	61.2	62.5
856	2018/05/09	17:06:00	65.4	65.2	65.0	64.5	62.5
861	2018/05/09	17:06:05	61.4	60.4	59.0	58.7	59.5
866	2018/05/09	17:06:10	67.5	69.4	68.4	68.3	67.0
871	2018/05/09	17:06:15	66.0	65.1	64.6	63.9	66.0
876	2018/05/09	17:06:20	64.4	64.4	62.7	60.7	60.4
881	2018/05/09	17:06:25	60.0	58.6	58.8	60.0	59.4
886	2018/05/09	17:06:30	59.0	60.1	61.8	63.0	65.9
891	2018/05/09	17:06:35	64.7	62.9	63.7	63.2	62.4
896	2018/05/09	17:06:40	63.9	65.5	65.5	64.0	63.8

- Freq Weight : A
- Time Weight : FAST
- Level Range : 40-100
- Max dB : 88.0 - 2018/05/09 16:28:57
- Level Range : 40-100
- SEL : 99.5
- Leq : 70.0
-

No.s	Date Time	(dB)				
1	2018/05/09 16:23:54	76.4	68.6	66.0	63.7	62.4
6	2018/05/09 16:23:59	64.5	67.2	70.5	76.2	78.9
11	2018/05/09 16:24:04	80.2	71.8	69.1	69.4	75.6
16	2018/05/09 16:24:09	69.0	63.5	61.8	62.1	61.0
21	2018/05/09 16:24:14	65.1	69.7	74.1	72.2	67.9
26	2018/05/09 16:24:19	71.0	70.0	64.3	62.7	62.3
31	2018/05/09 16:24:24	63.2	70.0	73.8	72.2	71.9
36	2018/05/09 16:24:29	78.6	67.3	64.6	60.9	60.2
41	2018/05/09 16:24:34	59.8	60.7	63.4	67.2	72.7
46	2018/05/09 16:24:39	81.2	77.8	68.9	66.3	69.0
51	2018/05/09 16:24:44	69.3	72.3	73.8	75.4	74.9
56	2018/05/09 16:24:49	74.6	73.2	71.3	68.1	66.5
61	2018/05/09 16:24:54	63.5	62.4	61.5	61.6	62.1
66	2018/05/09 16:24:59	64.6	71.3	77.2	69.1	63.4
71	2018/05/09 16:25:04	60.7	60.6	59.1	58.4	59.0
76	2018/05/09 16:25:09	60.0	60.9	62.5	69.0	76.4
81	2018/05/09 16:25:14	76.4	68.4	62.0	62.3	63.7
86	2018/05/09 16:25:19	66.9	72.3	80.8	75.0	71.1
91	2018/05/09 16:25:24	75.2	67.6	63.8	63.7	63.9
96	2018/05/09 16:25:29	68.0	75.1	75.4	68.5	63.6
101	2018/05/09 16:25:34	59.6	60.3	60.7	62.4	64.8
106	2018/05/09 16:25:39	69.5	74.3	73.4	70.1	70.8
111	2018/05/09 16:25:44	76.5	74.9	67.8	61.7	63.0
116	2018/05/09 16:25:49	61.4	60.5	59.7	59.2	60.2
121	2018/05/09 16:25:54	60.6	60.9	61.0	61.4	64.1
126	2018/05/09 16:25:59	69.0	75.3	72.7	69.1	70.0
131	2018/05/09 16:26:04	69.9	67.2	66.9	72.3	75.1
136	2018/05/09 16:26:09	73.9	69.5	67.7	66.6	70.9
141	2018/05/09 16:26:14	78.5	73.4	65.9	61.9	61.6
146	2018/05/09 16:26:19	61.9	65.0	68.4	69.9	71.8
151	2018/05/09 16:26:24	69.0	65.1	66.6	70.6	68.7
156	2018/05/09 16:26:29	66.0	64.0	61.8	60.4	58.8
161	2018/05/09 16:26:34	59.5	58.2	57.7	58.0	59.7
166	2018/05/09 16:26:39	60.9	59.9	59.4	61.2	64.2
171	2018/05/09 16:26:44	68.9	74.6	72.1	66.5	60.6
176	2018/05/09 16:26:49	58.8	58.9	58.5	58.3	58.2
181	2018/05/09 16:26:54	58.8	58.6	60.6	63.1	66.2
186	2018/05/09 16:26:59	74.1	76.0	73.7	67.7	66.1
191	2018/05/09 16:27:04	69.4	72.4	71.7	69.9	71.6
196	2018/05/09 16:27:09	72.3	70.6	66.0	63.9	65.5
201	2018/05/09 16:27:14	70.6	74.0	69.4	64.3	61.4
206	2018/05/09 16:27:19	62.9	64.4	68.8	74.4	77.7
211	2018/05/09 16:27:24	71.0	64.3	65.8	69.3	70.1
216	2018/05/09 16:27:29	67.3	64.1	64.9	68.2	69.3
221	2018/05/09 16:27:34	66.4	63.6	65.7	68.1	67.8
226	2018/05/09 16:27:39	65.1	68.8	73.4	76.7	68.1
231	2018/05/09 16:27:44	67.2	68.9	67.6	65.0	65.0
236	2018/05/09 16:27:49	66.7	70.9	70.1	68.4	66.6
241	2018/05/09 16:27:54	68.8	75.7	74.6	66.2	62.4
246	2018/05/09 16:27:59	61.7	64.7	66.7	71.7	74.3
251	2018/05/09 16:28:04	74.1	80.2	69.2	64.9	62.2
256	2018/05/09 16:28:09	61.7	62.0	62.6	65.5	70.5
261	2018/05/09 16:28:14	75.3	70.0	64.5	66.5	69.7
266	2018/05/09 16:28:19	71.8	65.3	62.6	62.5	63.1
271	2018/05/09 16:28:24	61.5	61.0	59.6	66.8	71.1
276	2018/05/09 16:28:29	70.8	70.2	73.5	72.8	71.0
281	2018/05/09 16:28:34	68.7	67.9	68.2	69.0	73.9
286	2018/05/09 16:28:39	75.1	67.5	64.0	67.1	72.9
291	2018/05/09 16:28:44	75.3	67.5	67.0	70.7	73.2
296	2018/05/09 16:28:49	71.4	72.9	79.9	71.6	73.6
301	2018/05/09 16:28:54	74.0	79.7	74.9	85.3	69.8
306	2018/05/09 16:28:59	74.5	78.5	68.1	63.5	58.8
311	2018/05/09 16:29:04	57.2	56.7	55.6	56.2	56.0
316	2018/05/09 16:29:09	55.5	55.7	56.2	56.4	56.3
321	2018/05/09 16:29:14	55.9	56.7	57.3	60.0	62.1
326	2018/05/09 16:29:19	68.0	70.4	67.8	65.3	63.1
331	2018/05/09 16:29:24	60.4	60.5	58.8	57.5	57.8
336	2018/05/09 16:29:29	57.9	59.6	60.4	62.1	63.3
341	2018/05/09 16:29:34	66.3	69.6	75.6	75.1	73.1
346	2018/05/09 16:29:39	75.1	78.3	76.9	77.5	76.7
351	2018/05/09 16:29:44	79.4	75.0	72.8	71.8	70.8
356	2018/05/09 16:29:49	71.1	71.9	70.6	69.6	73.4
361	2018/05/09 16:29:54	76.7	71.7	66.7	64.5	63.8
366	2018/05/09 16:29:59	62.2	61.7	67.2	69.5	69.0
371	2018/05/09 16:30:04	66.6	63.7	63.3	61.5	60.9
376	2018/05/09 16:30:09	58.7	58.9	57.8	57.7	58.5
381	2018/05/09 16:30:14	57.8	57.1	57.7	56.7	57.0
386	2018/05/09 16:30:19	56.9	56.8	57.5	57.2	57.1
391	2018/05/09 16:30:24	56.8	56.0	56.3	56.8	58.3
396	2018/05/09 16:30:29	57.2	57.7	58.8	61.2	64.5
401	2018/05/09 16:30:34	67.6	74.4	77.3	66.2	60.8
406	2018/05/09 16:30:39	58.3	57.6	58.8	57.3	57.2
411	2018/05/09 16:30:44	57.3	57.9	60.2	65.3	72.1
416	2018/05/09 16:30:49	72.7	72.1	69.1	72.6	75.9
421	2018/05/09 16:30:54	68.4	69.3	71.4	74.5	74.3

426	2018/05/09	16:30:59	73.4	71.6	70.8	71.3	73.9
431	2018/05/09	16:31:04	72.6	69.4	68.4	73.2	80.4
436	2018/05/09	16:31:09	79.2	77.0	73.7	70.1	67.7
441	2018/05/09	16:31:14	63.6	63.7	65.0	64.9	62.2
446	2018/05/09	16:31:19	62.4	63.3	64.1	66.4	66.0
451	2018/05/09	16:31:24	68.1	73.1	77.7	69.2	64.2
456	2018/05/09	16:31:29	62.2	62.4	63.3	67.7	74.5
461	2018/05/09	16:31:34	71.3	65.4	61.3	59.8	60.5
466	2018/05/09	16:31:39	61.1	63.1	61.9	61.6	61.1
471	2018/05/09	16:31:44	61.3	64.2	66.0	66.7	71.0
476	2018/05/09	16:31:49	76.4	79.2	73.5	71.9	69.7
481	2018/05/09	16:31:54	67.6	64.7	64.5	64.9	62.2
486	2018/05/09	16:31:59	61.2	60.8	59.4	60.5	62.8
491	2018/05/09	16:32:04	66.4	70.2	76.1	77.0	73.8
496	2018/05/09	16:32:09	73.5	69.3	67.5	69.8	71.2
501	2018/05/09	16:32:14	68.0	65.3	63.9	63.7	65.0
506	2018/05/09	16:32:19	70.0	71.3	74.5	78.7	72.5
511	2018/05/09	16:32:24	68.0	67.3	70.1	76.1	76.1
516	2018/05/09	16:32:29	75.7	74.5	76.5	83.2	73.2
521	2018/05/09	16:32:34	74.1	77.3	82.6	74.0	72.8
526	2018/05/09	16:32:39	70.7	68.5	70.3	70.9	68.8
531	2018/05/09	16:32:44	69.6	76.7	75.7	66.9	64.2
536	2018/05/09	16:32:49	60.9	61.4	60.8	63.1	66.9
541	2018/05/09	16:32:54	72.8	75.0	65.8	68.2	71.5
546	2018/05/09	16:32:59	77.6	68.9	63.6	64.6	65.6
551	2018/05/09	16:33:04	67.2	69.1	65.3	62.6	59.1
556	2018/05/09	16:33:09	59.2	61.0	59.9	62.2	63.9
561	2018/05/09	16:33:14	70.9	73.3	69.4	61.8	60.1
566	2018/05/09	16:33:19	60.9	62.7	68.9	73.4	71.0
571	2018/05/09	16:33:24	66.2	67.7	70.3	74.6	73.5
576	2018/05/09	16:33:29	65.8	62.5	61.4	62.9	64.6
581	2018/05/09	16:33:34	68.1	74.4	77.5	76.1	75.7
586	2018/05/09	16:33:39	77.3	78.4	79.4	74.5	73.6
591	2018/05/09	16:33:44	71.2	70.6	71.4	71.8	72.9
596	2018/05/09	16:33:49	72.8	70.6	69.5	66.6	67.0
601	2018/05/09	16:33:54	66.7	72.0	76.9	72.9	72.3
606	2018/05/09	16:33:59	75.4	76.3	74.2	72.2	67.0
611	2018/05/09	16:34:04	71.6	70.5	69.9	68.3	68.2
616	2018/05/09	16:34:09	71.7	73.7	72.2	75.9	70.8
621	2018/05/09	16:34:14	68.9	71.2	78.2	70.3	67.4
626	2018/05/09	16:34:19	68.7	70.8	70.5	66.2	66.4
631	2018/05/09	16:34:24	69.4	73.3	79.0	76.1	72.5
636	2018/05/09	16:34:29	75.3	78.9	78.2	74.4	74.4
641	2018/05/09	16:34:34	74.4	75.8	80.6	74.1	69.7
646	2018/05/09	16:34:39	71.5	78.0	74.1	69.1	72.8
651	2018/05/09	16:34:44	74.9	70.1	71.0	75.7	73.0
656	2018/05/09	16:34:49	71.1	73.0	72.0	70.8	72.4
661	2018/05/09	16:34:54	71.5	68.3	65.3	65.0	63.1
666	2018/05/09	16:34:59	65.1	65.6	65.6	65.8	64.3
671	2018/05/09	16:35:04	68.4	73.4	77.3	78.3	72.5
676	2018/05/09	16:35:09	72.6	69.7	65.1	64.7	63.4
681	2018/05/09	16:35:14	62.7	66.8	66.5	69.8	72.4
686	2018/05/09	16:35:19	72.0	69.6	67.4	66.9	71.5
691	2018/05/09	16:35:24	79.9	80.3	70.5	71.2	79.0
696	2018/05/09	16:35:29	73.5	76.2	71.1	70.7	74.4
701	2018/05/09	16:35:34	70.4	67.6	71.5	75.0	74.5
706	2018/05/09	16:35:39	74.0	67.4	64.1	62.6	66.6
711	2018/05/09	16:35:44	69.5	73.1	72.3	67.2	63.5
716	2018/05/09	16:35:49	63.0	63.4	67.1	69.5	71.1
721	2018/05/09	16:35:54	67.2	64.3	62.4	64.5	66.1
726	2018/05/09	16:35:59	71.2	72.9	71.4	75.3	70.6
731	2018/05/09	16:36:04	70.4	77.4	72.7	67.9	69.8
736	2018/05/09	16:36:09	77.8	77.9	75.0	79.7	71.0
741	2018/05/09	16:36:14	67.1	71.8	75.3	69.0	65.3
746	2018/05/09	16:36:19	64.1	62.6	63.7	65.1	68.2
751	2018/05/09	16:36:24	74.2	78.0	76.5	73.7	66.0
756	2018/05/09	16:36:29	61.0	59.5	59.4	59.5	59.1
761	2018/05/09	16:36:34	59.8	62.9	61.3	63.4	66.4
766	2018/05/09	16:36:39	70.5	80.1	74.4	69.8	73.4
771	2018/05/09	16:36:44	74.6	68.3	68.0	70.3	70.1
776	2018/05/09	16:36:49	75.7	72.8	71.0	77.0	70.3
781	2018/05/09	16:36:54	65.8	62.4	61.8	62.5	68.3
786	2018/05/09	16:36:59	64.8	68.1	67.6	64.8	62.5
791	2018/05/09	16:37:04	61.4	61.3	60.7	60.7	62.3
796	2018/05/09	16:37:09	63.8	71.6	76.7	78.1	68.6
801	2018/05/09	16:37:14	65.4	66.7	68.7	69.3	70.1
806	2018/05/09	16:37:19	70.3	76.1	73.3	65.9	62.9
811	2018/05/09	16:37:24	62.9	61.5	60.8	60.5	61.3
816	2018/05/09	16:37:29	64.1	70.0	70.0	67.5	68.7
821	2018/05/09	16:37:34	71.7	70.9	66.9	66.6	63.8
826	2018/05/09	16:37:39	67.1	67.3	69.7	71.8	75.1
831	2018/05/09	16:37:44	70.4	65.3	60.1	59.7	59.3
836	2018/05/09	16:37:49	59.1	58.5	59.3	59.2	58.9
841	2018/05/09	16:37:54	60.3	61.2	63.0	64.8	71.0
846	2018/05/09	16:37:59	78.2	73.6	78.1	72.8	75.7
851	2018/05/09	16:38:04	75.2	76.3	69.5	65.7	61.6
856	2018/05/09	16:38:09	64.5	62.5	68.7	73.1	80.7
861	2018/05/09	16:38:14	75.3	69.9	67.8	67.2	70.4
866	2018/05/09	16:38:19	73.8	74.5	77.6	78.9	79.4
871	2018/05/09	16:38:24	71.6	70.8	70.6	73.8	75.8
876	2018/05/09	16:38:29	76.9	78.3	79.0	75.5	71.9
881	2018/05/09	16:38:34	74.7	74.9	70.9	71.2	77.4
886	2018/05/09	16:38:39	79.0	74.8	73.8	71.2	69.1
891	2018/05/09	16:38:44	73.7	75.0	68.2	68.1	71.3
896	2018/05/09	16:38:49	71.0	70.9	70.4	66.9	62.9

Noise Measurement 9

- Freq Weight : A
- Time Weight : FAST
- Level Range : 40-100
- Max dB : 83.3 - 2018/05/09 15:55:31
- Level Range : 40-100
- SEL : 97.5
- Leq : 68.0
-

No.s	Date Time	(dB)				
1	2018/05/09 15:50:49	65.1	63.9	65.0	64.1	63.2
6	2018/05/09 15:50:54	64.2	66.6	68.2	70.3	70.5
11	2018/05/09 15:50:59	68.4	66.6	68.4	73.8	71.2
16	2018/05/09 15:51:04	66.3	65.5	68.9	72.9	71.9
21	2018/05/09 15:51:09	71.5	70.4	71.6	68.3	68.5
26	2018/05/09 15:51:14	71.4	70.8	67.6	70.5	69.4
31	2018/05/09 15:51:19	63.7	62.2	62.5	62.0	61.0
36	2018/05/09 15:51:24	61.2	60.9	60.4	63.1	67.7
41	2018/05/09 15:51:29	67.4	64.9	65.7	66.4	70.1
46	2018/05/09 15:51:34	71.1	71.1	67.6	68.9	65.8
51	2018/05/09 15:51:39	63.8	62.8	62.8	65.7	70.3
56	2018/05/09 15:51:44	72.4	70.7	72.5	70.2	65.3
61	2018/05/09 15:51:49	65.8	71.6	68.4	67.0	72.5
66	2018/05/09 15:51:54	70.4	66.2	64.7	64.9	66.3
71	2018/05/09 15:51:59	67.1	70.6	72.9	68.9	65.8
76	2018/05/09 15:52:04	65.2	62.4	62.7	64.3	64.5
81	2018/05/09 15:52:09	63.3	66.1	62.4	62.2	64.4
86	2018/05/09 15:52:14	67.1	64.0	63.6	62.0	58.2
91	2018/05/09 15:52:19	57.8	57.6	56.8	56.7	58.9
96	2018/05/09 15:52:24	59.8	60.5	63.6	70.4	71.5
101	2018/05/09 15:52:29	70.0	67.8	65.1	63.7	63.0
106	2018/05/09 15:52:34	64.7	66.4	66.2	64.7	62.4
111	2018/05/09 15:52:39	61.4	60.3	63.0	65.4	65.2
116	2018/05/09 15:52:44	64.8	64.4	63.6	63.4	62.8
121	2018/05/09 15:52:49	63.1	64.0	62.1	62.2	61.8
126	2018/05/09 15:52:54	61.9	60.8	61.2	60.2	62.3
131	2018/05/09 15:52:59	62.3	63.9	64.4	65.1	66.3
136	2018/05/09 15:53:04	68.4	73.4	73.3	71.9	70.0
141	2018/05/09 15:53:09	70.2	69.5	69.4	67.2	66.6
146	2018/05/09 15:53:14	67.3	66.4	65.7	65.8	66.2
151	2018/05/09 15:53:19	66.1	69.9	73.5	74.1	75.6
156	2018/05/09 15:53:24	73.9	74.0	73.6	73.9	72.4
161	2018/05/09 15:53:29	70.5	69.9	68.3	67.6	66.9
166	2018/05/09 15:53:34	69.0	67.7	72.0	71.6	73.4
171	2018/05/09 15:53:39	73.3	73.0	72.9	69.1	68.1
176	2018/05/09 15:53:44	66.4	66.6	67.5	72.4	69.4
181	2018/05/09 15:53:49	68.1	67.6	71.4	71.2	67.1
186	2018/05/09 15:53:54	65.7	63.1	61.5	62.7	60.8
191	2018/05/09 15:53:59	61.3	62.6	61.9	63.3	65.3
196	2018/05/09 15:54:04	66.1	64.3	64.5	72.3	71.6
201	2018/05/09 15:54:09	65.8	63.1	62.9	66.8	72.6
206	2018/05/09 15:54:14	74.5	74.1	67.7	68.1	72.3
211	2018/05/09 15:54:19	68.3	65.3	63.6	63.5	61.8
216	2018/05/09 15:54:24	62.7	62.5	61.4	61.2	60.6
221	2018/05/09 15:54:29	61.8	61.7	61.8	64.5	65.9
226	2018/05/09 15:54:34	64.5	62.9	62.8	65.9	67.5
231	2018/05/09 15:54:39	64.7	61.8	60.2	59.8	61.3
236	2018/05/09 15:54:44	63.6	65.8	63.1	59.9	58.0
241	2018/05/09 15:54:49	62.3	59.2	58.0	62.8	64.1
246	2018/05/09 15:54:54	58.2	62.5	64.7	67.8	65.6
251	2018/05/09 15:54:59	62.8	65.1	69.3	68.7	70.1
256	2018/05/09 15:55:04	68.4	67.9	70.0	66.4	64.6
261	2018/05/09 15:55:09	62.5	62.5	62.9	62.1	60.8
266	2018/05/09 15:55:14	59.2	60.8	59.2	57.7	56.5
271	2018/05/09 15:55:19	57.8	60.4	60.0	61.5	66.0
276	2018/05/09 15:55:24	71.0	73.0	69.1	70.4	71.7
281	2018/05/09 15:55:29	72.8	79.8	81.2	75.5	73.8
286	2018/05/09 15:55:34	75.4	71.8	69.1	67.4	65.7
291	2018/05/09 15:55:39	64.0	64.1	64.8	67.3	67.2
296	2018/05/09 15:55:44	67.1	71.1	71.8	67.1	64.4
301	2018/05/09 15:55:49	64.4	65.4	66.9	69.1	71.5
306	2018/05/09 15:55:54	67.3	69.4	70.6	67.5	67.9
311	2018/05/09 15:55:59	65.0	61.4	56.9	55.5	54.2
316	2018/05/09 15:56:04	56.3	58.6	59.6	62.7	64.9
321	2018/05/09 15:56:09	62.8	62.1	63.6	66.6	68.7
326	2018/05/09 15:56:14	69.6	68.0	64.8	60.5	60.3
331	2018/05/09 15:56:19	60.0	58.2	58.1	57.6	59.2
336	2018/05/09 15:56:24	56.7	58.5	60.5	61.2	64.4
341	2018/05/09 15:56:29	60.1	61.1	63.5	67.9	69.6
346	2018/05/09 15:56:34	67.4	62.5	61.4	64.4	66.3
351	2018/05/09 15:56:39	70.1	69.7	66.9	62.9	60.6
356	2018/05/09 15:56:44	60.8	64.9	71.1	74.4	73.3
361	2018/05/09 15:56:49	70.6	72.2	72.1	69.1	68.9
366	2018/05/09 15:56:54	68.4	66.6	66.3	68.2	67.9
371	2018/05/09 15:56:59	67.1	65.6	65.5	64.2	63.5
376	2018/05/09 15:57:04	63.8	64.9	68.9	72.3	73.6
381	2018/05/09 15:57:09	70.3	71.1	67.3	62.2	56.6
386	2018/05/09 15:57:14	53.8	54.1	54.2	54.3	54.7
391	2018/05/09 15:57:19	56.4	57.1	57.2	58.1	59.7
396	2018/05/09 15:57:24	60.5	59.9	59.4	58.7	58.7
401	2018/05/09 15:57:29	59.1	60.5	61.5	66.0	72.0
406	2018/05/09 15:57:34	71.8	67.3	63.7	58.9	57.4
411	2018/05/09 15:57:39	58.1	58.4	57.8	59.1	59.1
416	2018/05/09 15:57:44	64.1	68.5	69.0	70.3	70.5
421	2018/05/09 15:57:49	64.1	70.9	69.7	71.1	68.6

426	2018/05/09	15:57:54	66.6	63.3	61.9	61.5	61.1
431	2018/05/09	15:57:59	59.5	58.7	60.8	61.0	59.7
436	2018/05/09	15:58:04	59.6	58.0	58.2	71.0	70.4
441	2018/05/09	15:58:09	69.0	68.6	71.7	71.1	69.1
446	2018/05/09	15:58:14	64.9	64.7	64.5	66.9	69.5
451	2018/05/09	15:58:19	67.0	63.5	63.1	61.6	61.0
456	2018/05/09	15:58:24	61.9	61.6	62.8	63.2	63.9
461	2018/05/09	15:58:29	67.5	74.3	76.8	71.4	71.7
466	2018/05/09	15:58:34	74.1	72.3	70.0	71.4	72.1
471	2018/05/09	15:58:39	72.8	72.4	68.9	67.3	67.4
476	2018/05/09	15:58:44	68.8	68.1	67.3	65.9	64.9
481	2018/05/09	15:58:49	65.7	65.5	66.7	66.2	66.6
486	2018/05/09	15:58:54	65.6	66.2	64.5	65.5	65.7
491	2018/05/09	15:58:59	64.6	67.8	70.5	67.2	64.9
496	2018/05/09	15:59:04	63.0	63.9	66.0	67.3	64.8
501	2018/05/09	15:59:09	63.8	63.7	63.4	61.9	62.6
506	2018/05/09	15:59:14	64.9	63.8	61.9	60.4	60.7
511	2018/05/09	15:59:19	61.5	62.0	61.5	62.6	64.7
516	2018/05/09	15:59:24	65.4	65.7	66.5	67.8	67.6
521	2018/05/09	15:59:29	66.3	65.2	64.5	64.0	64.5
526	2018/05/09	15:59:34	60.9	61.1	61.1	59.7	59.4
531	2018/05/09	15:59:39	59.5	60.2	60.5	60.8	62.9
536	2018/05/09	15:59:44	63.8	65.0	68.0	69.0	67.7
541	2018/05/09	15:59:49	66.3	65.5	65.2	65.7	64.2
546	2018/05/09	15:59:54	63.1	66.1	72.1	72.8	72.0
551	2018/05/09	15:59:59	74.0	69.5	65.8	66.3	68.9
556	2018/05/09	16:00:04	69.7	67.5	67.6	68.3	66.6
561	2018/05/09	16:00:09	67.8	68.1	66.6	66.5	65.3
566	2018/05/09	16:00:14	65.8	64.9	62.0	61.3	63.9
571	2018/05/09	16:00:19	66.8	64.8	62.8	60.0	59.3
576	2018/05/09	16:00:24	61.4	63.0	63.4	62.7	60.1
581	2018/05/09	16:00:29	57.3	56.8	57.6	57.9	58.2
586	2018/05/09	16:00:34	61.0	58.3	60.0	60.4	61.4
591	2018/05/09	16:00:39	61.6	61.3	60.6	61.2	62.1
596	2018/05/09	16:00:44	62.1	62.0	65.8	65.6	65.9
601	2018/05/09	16:00:49	66.6	67.3	65.9	63.4	62.9
606	2018/05/09	16:00:54	63.4	64.7	65.2	66.0	65.2
611	2018/05/09	16:00:59	65.4	68.9	70.9	69.7	69.1
616	2018/05/09	16:01:04	70.8	67.9	65.7	60.5	58.2
621	2018/05/09	16:01:09	56.3	58.3	59.1	62.0	64.3
626	2018/05/09	16:01:14	74.3	74.0	69.3	73.3	71.5
631	2018/05/09	16:01:19	67.2	68.0	67.6	65.2	65.9
636	2018/05/09	16:01:24	66.1	65.1	66.3	70.0	68.8
641	2018/05/09	16:01:29	65.3	64.0	63.9	67.1	70.4
646	2018/05/09	16:01:34	72.0	71.3	71.0	70.6	70.8
651	2018/05/09	16:01:39	71.4	70.6	66.6	67.1	71.1
656	2018/05/09	16:01:44	69.1	68.2	71.9	72.9	69.2
661	2018/05/09	16:01:49	69.9	70.4	68.0	65.5	65.4
666	2018/05/09	16:01:54	66.5	70.3	69.7	64.0	61.6
671	2018/05/09	16:01:59	62.3	63.2	63.1	64.4	64.9
676	2018/05/09	16:02:04	64.4	62.8	62.0	61.8	64.4
681	2018/05/09	16:02:09	68.1	67.2	65.7	65.1	63.0
686	2018/05/09	16:02:14	60.7	60.2	59.3	58.2	58.1
691	2018/05/09	16:02:19	58.0	57.6	57.4	58.3	59.3
696	2018/05/09	16:02:24	59.5	63.2	70.2	72.4	66.3
701	2018/05/09	16:02:29	61.9	59.1	56.3	56.0	56.5
706	2018/05/09	16:02:34	57.7	58.8	60.3	64.3	66.4
711	2018/05/09	16:02:39	68.1	68.6	69.4	71.2	72.8
716	2018/05/09	16:02:44	70.0	67.5	67.1	67.6	67.2
721	2018/05/09	16:02:49	66.8	64.9	61.4	60.5	63.3
726	2018/05/09	16:02:54	62.7	66.6	73.2	71.8	70.9
731	2018/05/09	16:02:59	71.8	72.2	70.9	72.4	69.7
736	2018/05/09	16:03:04	66.6	68.7	67.4	64.1	60.7
741	2018/05/09	16:03:09	60.4	61.1	62.1	65.7	66.4
746	2018/05/09	16:03:14	64.8	65.1	63.6	59.8	62.6
751	2018/05/09	16:03:19	59.4	62.9	66.4	64.6	62.7
756	2018/05/09	16:03:24	60.8	60.2	62.1	62.1	60.8
761	2018/05/09	16:03:29	61.7	61.9	61.1	58.9	58.1
766	2018/05/09	16:03:34	58.8	58.4	56.9	56.2	55.9
771	2018/05/09	16:03:39	55.6	55.4	56.3	57.0	59.6
776	2018/05/09	16:03:44	61.4	63.6	66.1	69.0	69.5
781	2018/05/09	16:03:49	67.7	64.7	67.2	70.7	70.5
786	2018/05/09	16:03:54	69.0	67.9	66.0	62.9	60.3
791	2018/05/09	16:03:59	60.4	61.6	61.5	61.8	60.7
796	2018/05/09	16:04:04	61.6	64.6	63.1	65.5	65.7
801	2018/05/09	16:04:09	64.4	64.7	65.5	64.5	62.9
806	2018/05/09	16:04:14	63.2	64.5	63.7	65.8	68.3
811	2018/05/09	16:04:19	72.0	71.3	72.9	72.3	70.4
816	2018/05/09	16:04:24	70.3	67.1	64.3	63.9	62.9
821	2018/05/09	16:04:29	62.9	64.1	66.6	72.2	70.3
826	2018/05/09	16:04:34	65.8	63.8	61.2	61.4	62.7
831	2018/05/09	16:04:39	62.5	61.0	60.0	61.6	62.4
836	2018/05/09	16:04:44	63.8	69.2	65.8	63.5	65.2
841	2018/05/09	16:04:49	69.9	70.3	65.3	62.9	68.3
846	2018/05/09	16:04:54	74.5	65.4	64.9	60.8	61.1
851	2018/05/09	16:04:59	61.9	64.3	66.9	72.3	79.4
856	2018/05/09	16:05:04	73.8	70.2	68.0	67.6	67.9
861	2018/05/09	16:05:09	75.8	72.8	75.5	76.8	75.0
866	2018/05/09	16:05:14	80.5	77.9	74.6	72.4	68.8
871	2018/05/09	16:05:19	69.3	70.4	69.1	68.2	70.8
876	2018/05/09	16:05:24	73.8	72.8	68.5	66.8	64.7
881	2018/05/09	16:05:29	62.9	61.3	62.9	62.1	63.4
886	2018/05/09	16:05:34	61.7	62.2	63.8	67.9	67.7
891	2018/05/09	16:05:39	71.5	70.6	68.8	66.6	68.4
896	2018/05/09	16:05:44	71.7	70.2	71.2	71.2	70.5

Noise Measurement 10

- Freq Weight : A
- Time Weight : FAST
- Level Range : 40-100
- Max dB : 82.7 - 2018/05/09 15:23:58
- Level Range : 40-100
- SEL : 99.5
- Leq : 70.0
-

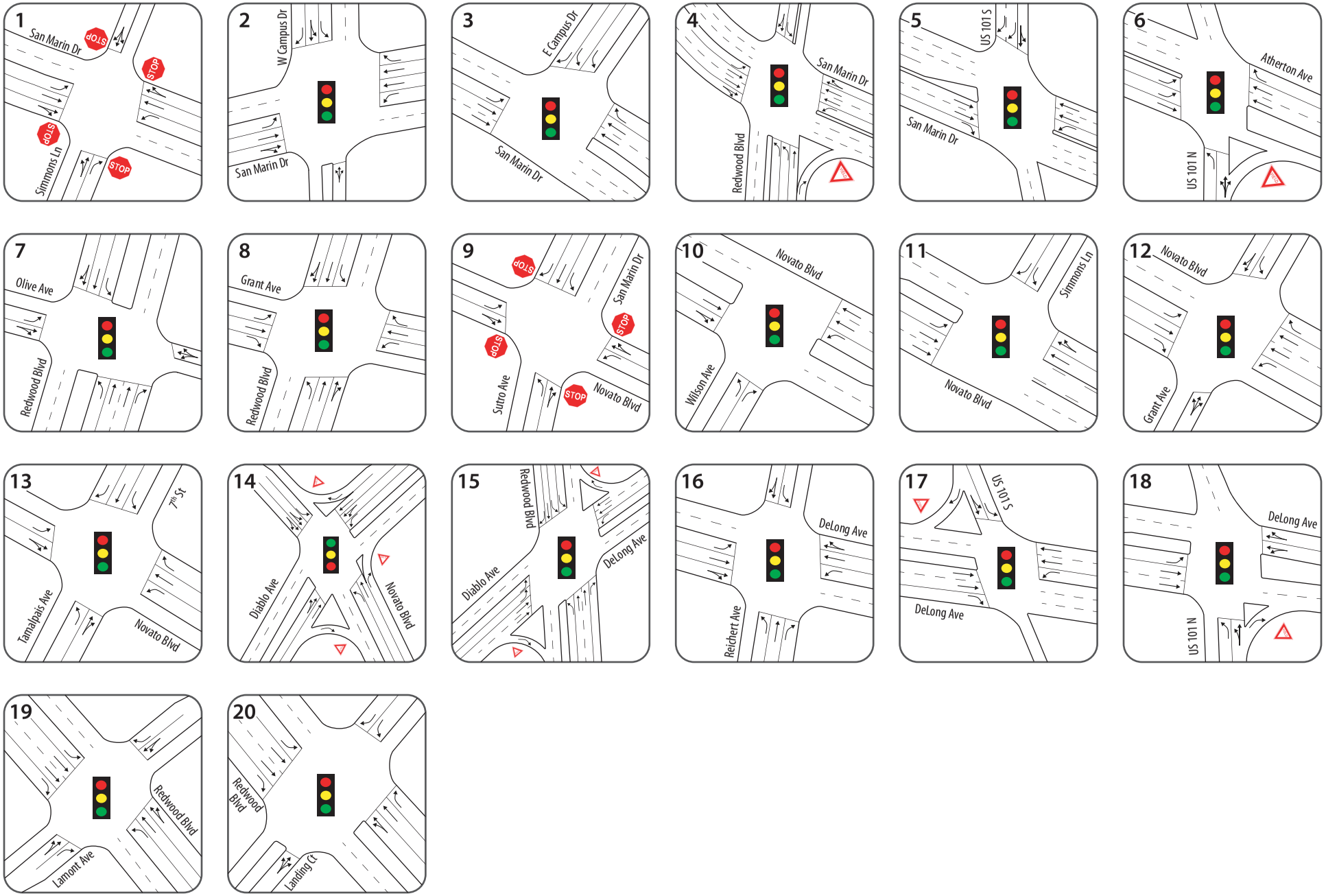
No.s	Date Time	(dB)				
1	2018/05/09 15:20:04	73.3	70.5	68.9	69.5	70.5
6	2018/05/09 15:20:09	69.7	67.8	64.8	64.5	63.5
11	2018/05/09 15:20:14	64.1	65.8	68.7	70.5	68.0
16	2018/05/09 15:20:19	67.8	67.0	68.0	70.3	73.9
21	2018/05/09 15:20:24	76.0	74.9	76.3	74.8	73.5
26	2018/05/09 15:20:29	76.9	76.5	73.9	70.9	68.7
31	2018/05/09 15:20:34	69.1	72.0	78.4	73.3	70.5
36	2018/05/09 15:20:39	73.4	71.6	69.1	73.0	72.2
41	2018/05/09 15:20:44	74.1	75.6	71.8	71.3	72.5
46	2018/05/09 15:20:49	73.8	76.1	73.4	71.6	71.9
51	2018/05/09 15:20:54	68.9	70.6	69.3	68.5	70.3
56	2018/05/09 15:20:59	68.1	68.3	67.1	65.9	64.9
61	2018/05/09 15:21:04	66.7	67.2	68.5	68.6	67.7
66	2018/05/09 15:21:09	68.5	64.3	63.2	62.7	62.9
71	2018/05/09 15:21:14	63.1	63.0	64.1	65.1	66.4
76	2018/05/09 15:21:19	68.7	70.8	72.3	73.0	69.8
81	2018/05/09 15:21:24	67.2	66.2	68.7	70.3	70.0
86	2018/05/09 15:21:29	72.0	76.0	76.5	76.7	73.3
91	2018/05/09 15:21:34	73.7	75.4	74.3	77.9	75.1
96	2018/05/09 15:21:39	72.3	73.5	73.6	75.0	72.3
101	2018/05/09 15:21:44	70.9	76.5	77.9	72.6	71.6
106	2018/05/09 15:21:49	75.1	74.2	70.6	68.9	69.2
111	2018/05/09 15:21:54	72.1	76.4	77.7	70.4	69.6
116	2018/05/09 15:21:59	70.0	71.1	70.5	69.9	68.5
121	2018/05/09 15:22:04	67.9	66.7	66.2	66.3	65.6
126	2018/05/09 15:22:09	65.4	65.4	65.8	66.1	67.1
131	2018/05/09 15:22:14	65.5	65.0	64.2	65.0	66.2
136	2018/05/09 15:22:19	67.4	72.6	72.6	70.8	75.0
141	2018/05/09 15:22:24	72.6	73.1	73.3	75.3	74.0
146	2018/05/09 15:22:29	69.7	69.5	72.3	72.4	73.0
151	2018/05/09 15:22:34	72.5	71.7	71.3	71.2	71.4
156	2018/05/09 15:22:39	68.5	70.5	75.1	75.3	69.5
161	2018/05/09 15:22:44	65.5	65.4	63.7	63.8	65.4
166	2018/05/09 15:22:49	66.6	66.8	66.6	67.5	67.0
171	2018/05/09 15:22:54	68.0	68.4	69.1	67.8	64.8
176	2018/05/09 15:22:59	63.9	62.6	63.2	64.1	63.7
181	2018/05/09 15:23:04	65.1	66.0	71.7	71.1	67.2
186	2018/05/09 15:23:09	65.5	65.0	64.9	64.8	63.7
191	2018/05/09 15:23:14	63.7	65.5	66.3	63.2	63.4
196	2018/05/09 15:23:19	66.2	66.3	66.4	68.1	68.5
201	2018/05/09 15:23:24	66.2	66.8	67.6	66.8	67.3
206	2018/05/09 15:23:29	67.4	66.7	67.3	67.4	68.8
211	2018/05/09 15:23:34	69.6	71.8	75.4	72.9	75.0
216	2018/05/09 15:23:39	73.1	72.3	71.3	70.5	70.4
221	2018/05/09 15:23:44	69.4	70.3	69.9	68.1	66.9
226	2018/05/09 15:23:49	64.6	63.1	64.3	65.3	64.7
231	2018/05/09 15:23:54	66.2	68.6	73.6	80.0	79.1
236	2018/05/09 15:23:59	72.4	70.7	69.7	69.8	71.0
241	2018/05/09 15:24:04	76.4	72.1	70.3	70.4	69.9
246	2018/05/09 15:24:09	66.5	67.0	68.1	68.5	68.5
251	2018/05/09 15:24:14	68.7	67.5	68.3	72.7	71.4
256	2018/05/09 15:24:19	69.4	68.9	68.9	67.5	66.1
261	2018/05/09 15:24:24	65.2	66.8	67.1	66.3	65.0
266	2018/05/09 15:24:29	66.1	67.3	68.5	68.7	67.4
271	2018/05/09 15:24:34	67.5	68.8	68.8	68.3	69.0
276	2018/05/09 15:24:39	69.0	67.6	67.2	68.2	69.0
281	2018/05/09 15:24:44	74.1	73.4	70.4	71.2	72.1
286	2018/05/09 15:24:49	72.8	69.7	68.0	68.8	68.8
291	2018/05/09 15:24:54	68.1	67.7	68.6	70.1	69.7
296	2018/05/09 15:24:59	70.2	69.7	68.1	68.5	70.8
301	2018/05/09 15:25:04	74.0	71.5	69.4	66.4	66.6
306	2018/05/09 15:25:09	67.0	70.0	71.7	69.5	68.0
311	2018/05/09 15:25:14	69.5	70.2	72.5	68.7	68.4
316	2018/05/09 15:25:19	66.3	65.7	66.5	69.1	68.9
321	2018/05/09 15:25:24	67.3	67.2	66.5	67.1	67.8
326	2018/05/09 15:25:29	68.5	68.0	66.7	67.2	67.7
331	2018/05/09 15:25:34	67.6	68.6	65.9	67.6	66.7
336	2018/05/09 15:25:39	68.4	73.2	72.9	70.7	70.5
341	2018/05/09 15:25:44	68.6	67.9	66.5	64.8	62.7
346	2018/05/09 15:25:49	62.9	64.6	69.2	76.0	71.9
351	2018/05/09 15:25:54	68.3	70.1	73.7	73.0	68.3
356	2018/05/09 15:25:59	65.9	65.3	68.0	68.5	75.4
361	2018/05/09 15:26:04	77.0	76.8	74.0	73.7	75.5
366	2018/05/09 15:26:09	73.1	68.6	66.7	66.2	66.1
371	2018/05/09 15:26:14	66.0	67.2	67.2	66.7	68.7
376	2018/05/09 15:26:19	69.4	68.8	69.4	69.5	68.2
381	2018/05/09 15:26:24	71.8	75.1	75.0	76.8	75.8
386	2018/05/09 15:26:29	75.3	75.5	77.3	75.8	76.1
391	2018/05/09 15:26:34	75.0	77.5	75.9	73.9	75.6
396	2018/05/09 15:26:39	73.8	72.6	72.2	74.3	72.1
401	2018/05/09 15:26:44	68.5	67.1	66.4	66.1	65.0
406	2018/05/09 15:26:49	64.8	65.5	65.3	64.1	65.4
411	2018/05/09 15:26:54	64.2	65.4	66.6	67.0	65.3
416	2018/05/09 15:26:59	64.1	64.1	63.0	62.5	63.4
421	2018/05/09 15:27:04	63.7	64.7	66.7	66.0	68.4

426	2018/05/09	15:27:09	65.9	67.8	73.8	75.6	72.5
431	2018/05/09	15:27:14	75.3	73.6	74.6	74.6	75.2
436	2018/05/09	15:27:19	71.2	68.3	67.2	66.8	68.6
441	2018/05/09	15:27:24	69.9	71.8	76.5	81.7	77.3
446	2018/05/09	15:27:29	74.9	73.4	73.0	73.8	73.1
451	2018/05/09	15:27:34	72.2	71.6	71.6	71.9	70.4
456	2018/05/09	15:27:39	69.3	67.6	67.4	68.3	65.8
461	2018/05/09	15:27:44	66.7	66.3	64.9	66.0	67.5
466	2018/05/09	15:27:49	65.9	68.5	69.5	67.4	65.8
471	2018/05/09	15:27:54	66.9	66.8	65.9	67.7	68.2
476	2018/05/09	15:27:59	67.2	67.1	66.5	64.7	63.8
481	2018/05/09	15:28:04	65.0	66.8	67.2	69.8	71.7
486	2018/05/09	15:28:09	72.1	70.6	69.7	67.7	67.9
491	2018/05/09	15:28:14	68.1	69.0	72.9	77.5	76.2
496	2018/05/09	15:28:19	74.5	75.3	75.8	75.1	75.3
501	2018/05/09	15:28:24	76.9	76.4	76.8	77.7	77.0
506	2018/05/09	15:28:29	75.8	74.5	73.5	74.4	76.9
511	2018/05/09	15:28:34	76.5	70.9	67.7	67.4	68.4
516	2018/05/09	15:28:39	67.1	65.8	64.0	63.4	62.7
521	2018/05/09	15:28:44	63.9	63.4	62.6	63.4	64.1
526	2018/05/09	15:28:49	65.0	66.1	65.1	66.8	68.3
531	2018/05/09	15:28:54	66.4	67.8	67.2	65.6	63.6
536	2018/05/09	15:28:59	64.3	64.5	64.8	66.2	71.8
541	2018/05/09	15:29:04	71.1	73.2	79.6	74.8	79.0
546	2018/05/09	15:29:09	76.8	75.3	71.7	70.1	68.6
551	2018/05/09	15:29:14	68.8	68.8	74.0	78.4	71.9
556	2018/05/09	15:29:19	69.9	70.5	76.0	76.4	76.3
561	2018/05/09	15:29:24	70.4	67.8	66.7	66.8	68.6
566	2018/05/09	15:29:29	69.8	68.7	66.4	63.6	64.0
571	2018/05/09	15:29:34	64.1	66.8	65.5	65.6	65.6
576	2018/05/09	15:29:39	65.6	65.1	65.0	65.8	64.6
581	2018/05/09	15:29:44	66.0	67.0	68.6	66.1	64.6
586	2018/05/09	15:29:49	65.5	68.3	72.0	73.5	74.9
591	2018/05/09	15:29:54	73.8	75.2	77.4	78.0	74.9
596	2018/05/09	15:29:59	72.0	69.6	70.6	70.5	74.9
601	2018/05/09	15:30:04	79.2	74.5	78.4	75.6	69.6
606	2018/05/09	15:30:09	68.8	69.6	73.6	79.7	77.1
611	2018/05/09	15:30:14	79.2	72.8	67.9	61.1	63.2
616	2018/05/09	15:30:19	66.7	66.8	66.2	67.2	68.3
621	2018/05/09	15:30:24	69.3	69.9	71.1	67.6	66.0
626	2018/05/09	15:30:29	65.5	65.2	64.5	64.9	65.8
631	2018/05/09	15:30:34	67.2	68.8	70.1	70.0	75.7
636	2018/05/09	15:30:39	72.1	71.4	71.3	71.4	73.0
641	2018/05/09	15:30:44	73.0	72.1	74.3	73.8	72.2
646	2018/05/09	15:30:49	71.5	75.0	77.7	67.8	64.2
651	2018/05/09	15:30:54	65.0	65.4	68.2	72.2	74.5
656	2018/05/09	15:30:59	72.3	66.2	65.6	65.2	63.9
661	2018/05/09	15:31:04	65.0	65.4	67.0	71.1	73.5
666	2018/05/09	15:31:09	77.2	70.6	67.4	70.4	71.6
671	2018/05/09	15:31:14	70.1	66.9	64.8	65.5	64.3
676	2018/05/09	15:31:19	63.5	61.8	62.5	63.4	65.0
681	2018/05/09	15:31:24	66.0	65.5	66.6	67.4	67.6
686	2018/05/09	15:31:29	68.9	68.1	65.9	65.8	66.3
691	2018/05/09	15:31:34	65.1	65.3	66.8	70.9	73.4
696	2018/05/09	15:31:39	71.6	68.2	68.5	69.7	71.6
701	2018/05/09	15:31:44	74.1	73.7	75.4	73.4	68.6
706	2018/05/09	15:31:49	66.2	64.7	64.7	64.1	63.7
711	2018/05/09	15:31:54	62.5	62.2	62.8	65.0	68.8
716	2018/05/09	15:31:59	66.5	64.1	63.5	64.1	63.7
721	2018/05/09	15:32:04	62.4	62.9	64.4	62.9	64.3
726	2018/05/09	15:32:09	63.5	63.9	63.4	64.4	64.2
731	2018/05/09	15:32:14	64.5	64.5	65.4	65.4	65.9
736	2018/05/09	15:32:19	66.3	68.2	69.3	69.6	71.7
741	2018/05/09	15:32:24	70.0	71.8	71.9	72.8	74.3
746	2018/05/09	15:32:29	72.0	70.4	70.3	72.4	72.7
751	2018/05/09	15:32:34	70.5	67.7	66.6	66.1	67.4
756	2018/05/09	15:32:39	73.7	74.2	69.9	71.0	74.5
761	2018/05/09	15:32:44	72.0	74.6	74.4	77.1	74.8
766	2018/05/09	15:32:49	75.7	74.6	71.5	68.6	68.9
771	2018/05/09	15:32:54	71.8	77.3	76.4	75.6	77.5
776	2018/05/09	15:32:59	72.6	70.9	70.2	68.1	68.2
781	2018/05/09	15:33:04	67.2	65.8	67.1	68.6	69.6
786	2018/05/09	15:33:09	67.5	67.9	67.1	66.7	65.6
791	2018/05/09	15:33:14	67.2	64.6	65.8	66.1	65.3
796	2018/05/09	15:33:19	66.2	65.6	65.4	65.2	67.3
801	2018/05/09	15:33:24	69.2	69.0	67.3	67.3	68.3
806	2018/05/09	15:33:29	71.5	70.9	69.9	69.6	71.3
811	2018/05/09	15:33:34	69.1	66.7	65.9	67.4	68.4
816	2018/05/09	15:33:39	72.8	75.6	74.0	76.1	71.7
821	2018/05/09	15:33:44	71.0	76.6	75.3	72.7	72.1
826	2018/05/09	15:33:49	71.0	72.7	75.0	81.7	74.6
831	2018/05/09	15:33:54	72.1	76.1	76.9	74.2	75.7
836	2018/05/09	15:33:59	75.5	70.7	68.1	67.5	64.6
841	2018/05/09	15:34:04	64.4	64.6	66.9	67.0	66.5
846	2018/05/09	15:34:09	64.8	65.2	65.8	66.0	66.8
851	2018/05/09	15:34:14	72.3	72.8	67.8	65.7	65.9
856	2018/05/09	15:34:19	64.4	64.5	65.3	65.3	64.2
861	2018/05/09	15:34:24	65.0	65.0	64.7	65.0	65.5
866	2018/05/09	15:34:29	66.3	66.2	66.5	67.1	67.4
871	2018/05/09	15:34:34	70.9	73.1	70.1	70.0	71.9
876	2018/05/09	15:34:39	70.1	70.9	73.0	72.3	70.8
881	2018/05/09	15:34:44	71.7	73.2	72.0	69.8	66.7
886	2018/05/09	15:34:49	66.1	65.5	66.7	68.5	69.3
891	2018/05/09	15:34:54	75.3	74.5	74.8	73.2	73.5
896	2018/05/09	15:34:59	73.8	72.8	73.8	71.2	73.8

Appendix E

Traffic Data

Intersection Lane Configuration and Traffic Volume Figures



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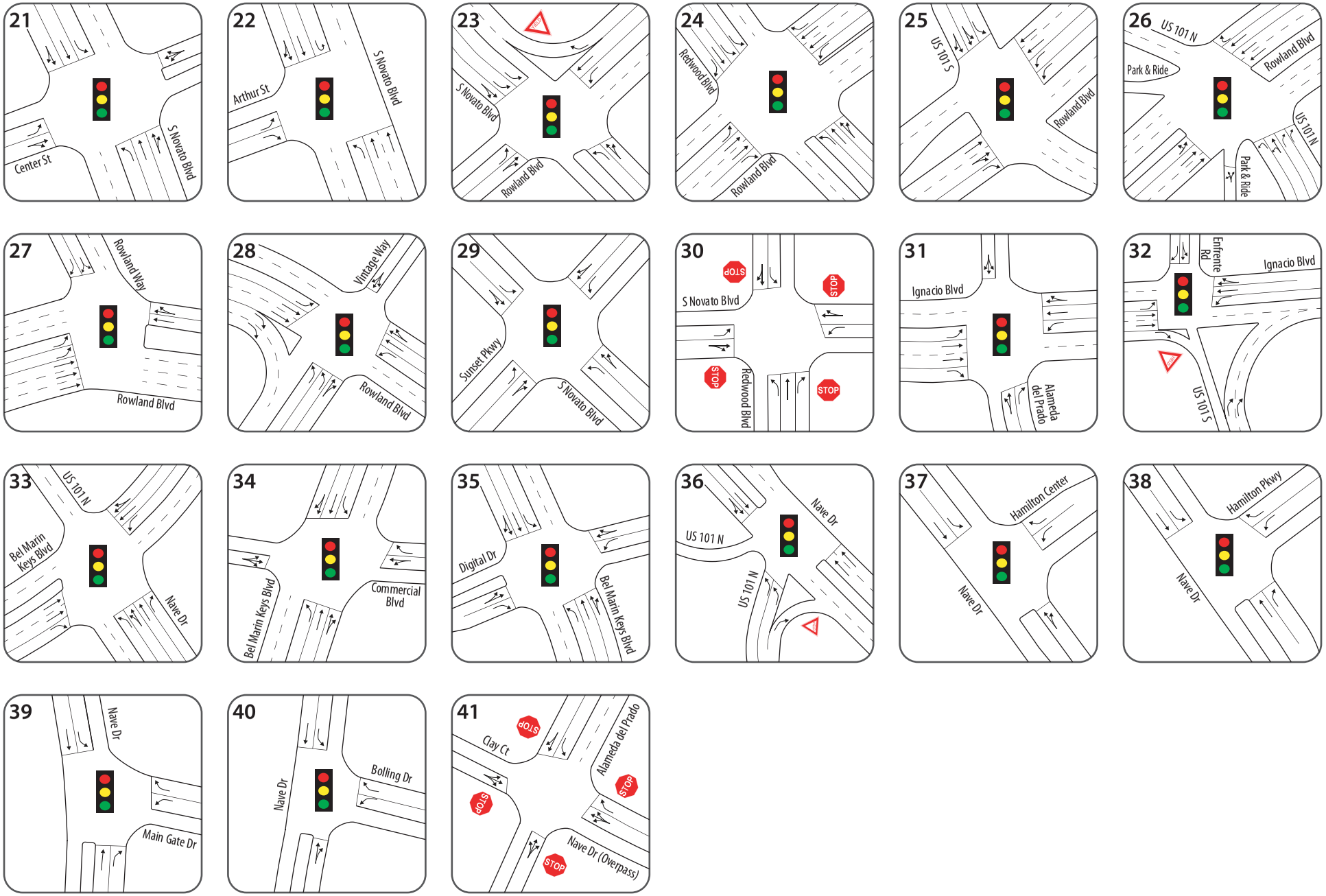
Novato General Plan Update EIR

Figure 1A – Existing Lane Configurations

W-Trans



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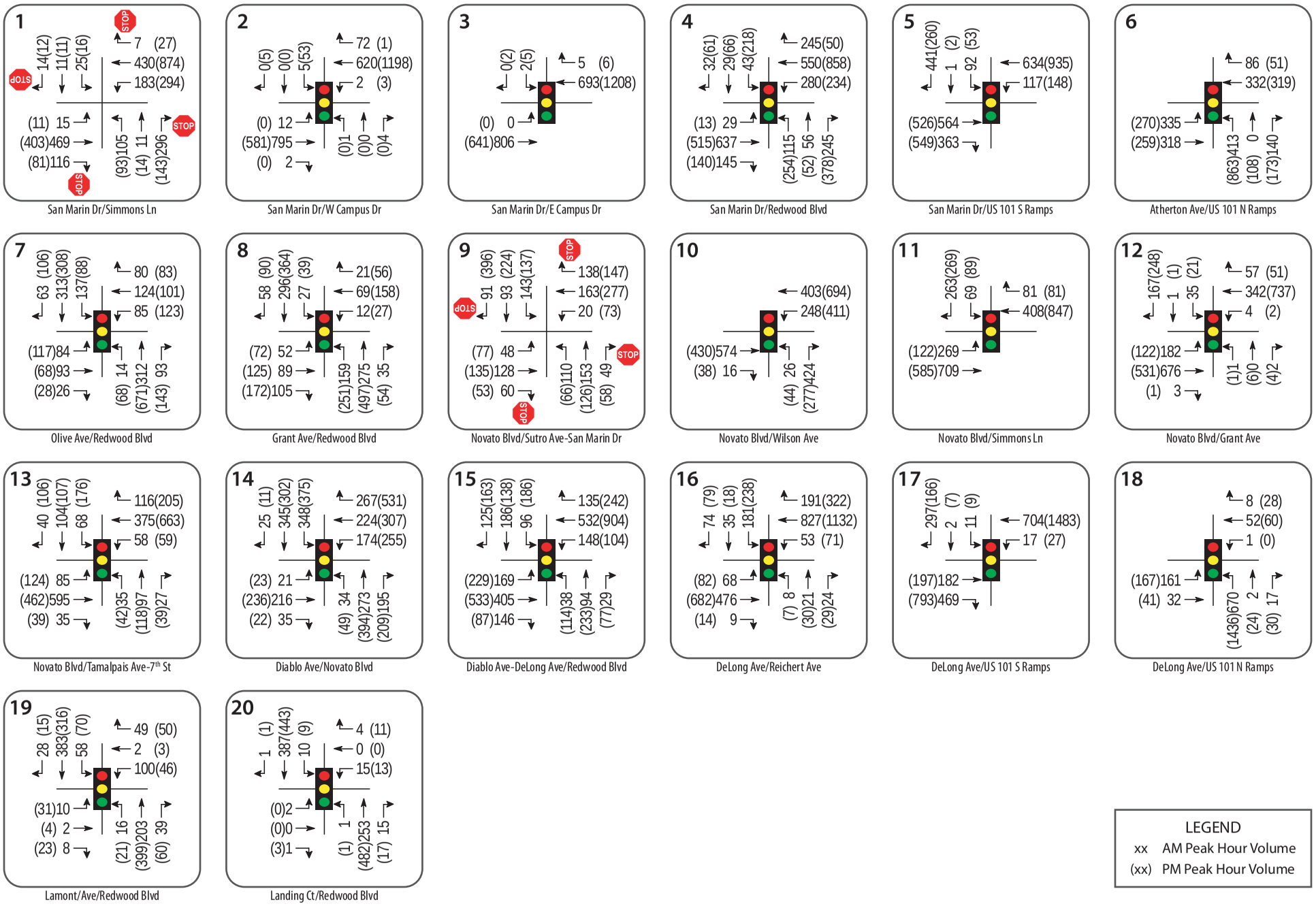
Novato General Plan Update EIR

Figure 1B – Existing Lane Configurations



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Novato General Plan Update EIR

Figure 2A – Existing Traffic Volumes

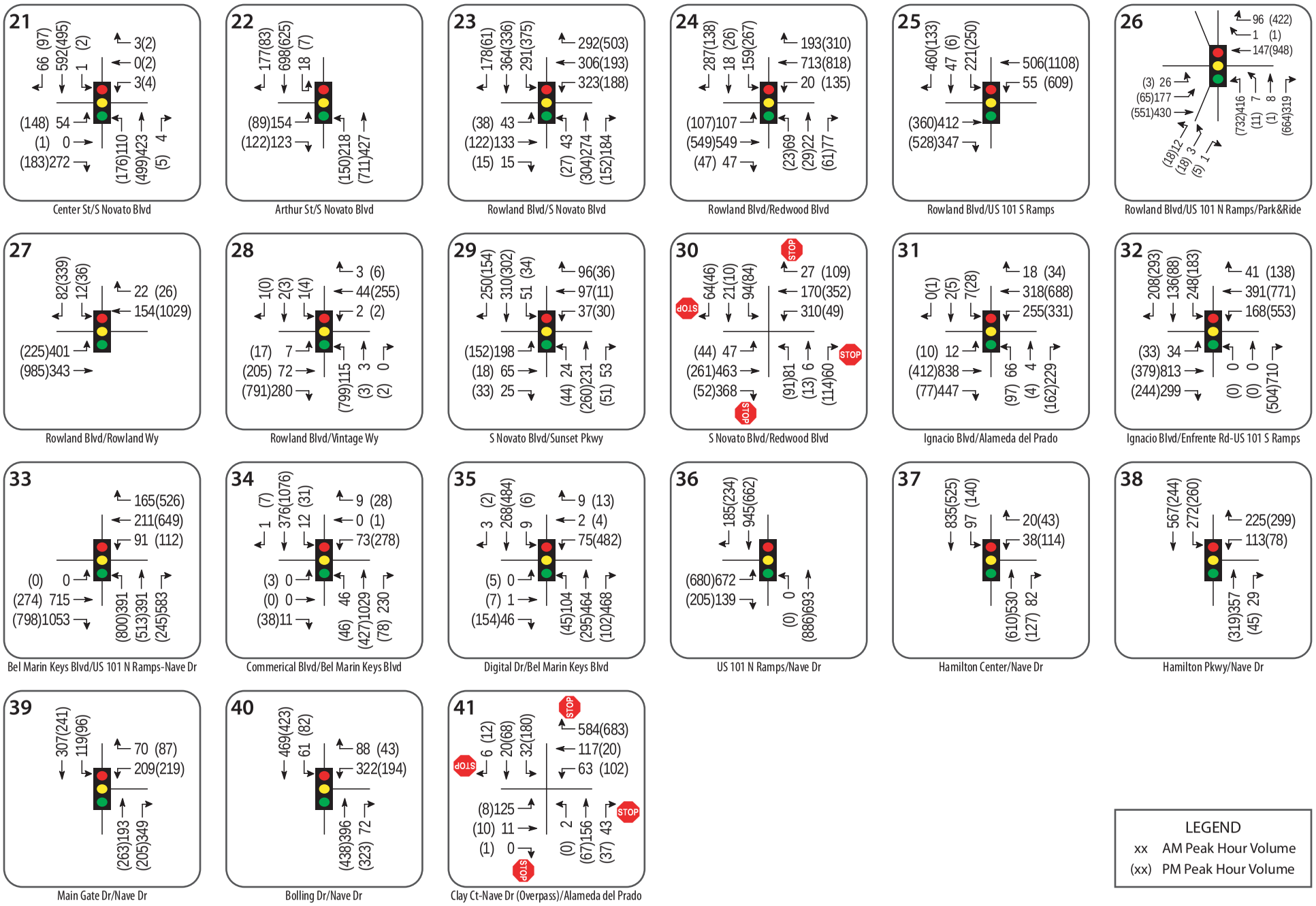

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Figure 2B – Existing Traffic Volumes

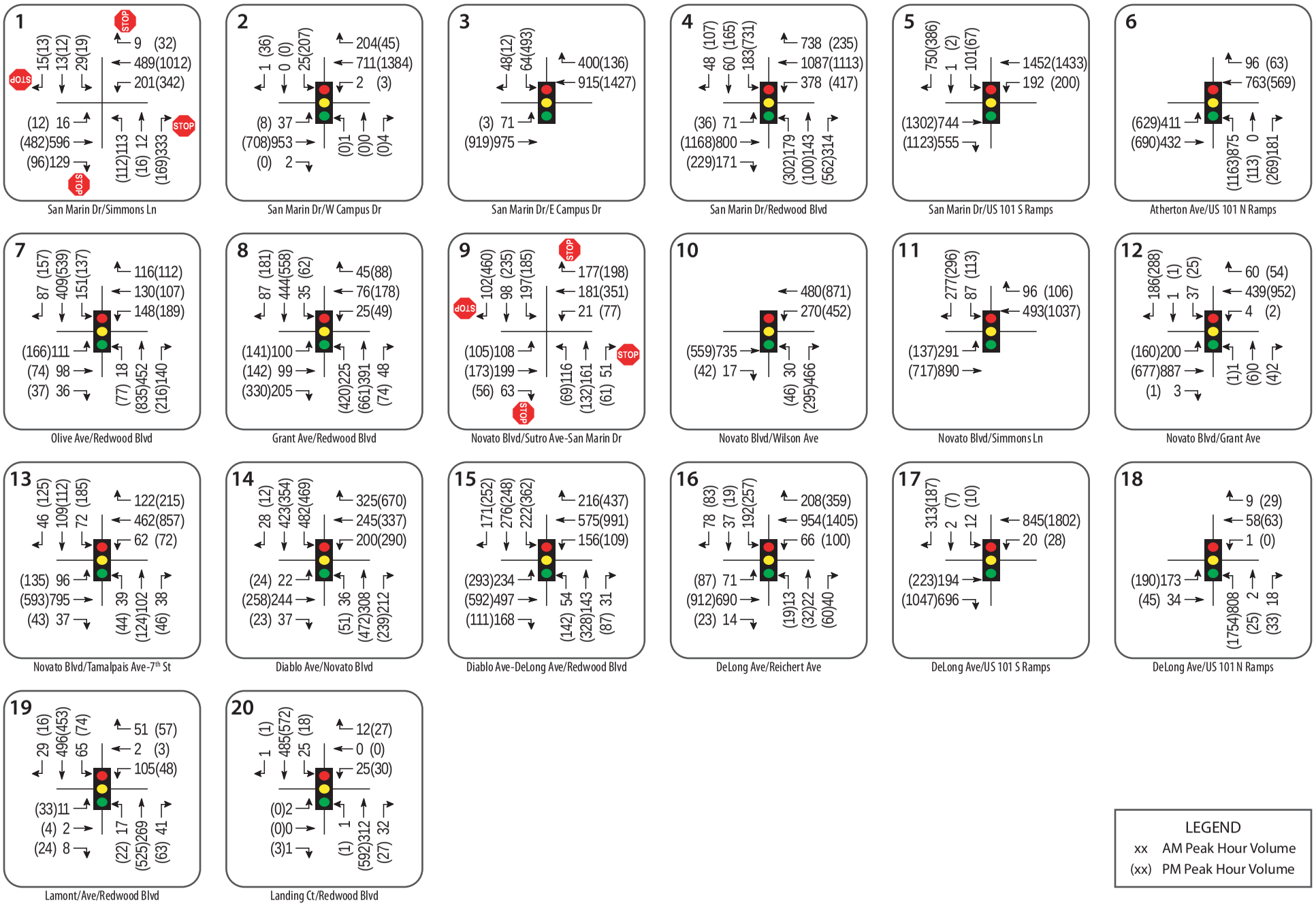

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Figure 3A – Cumulative Traffic Volumes

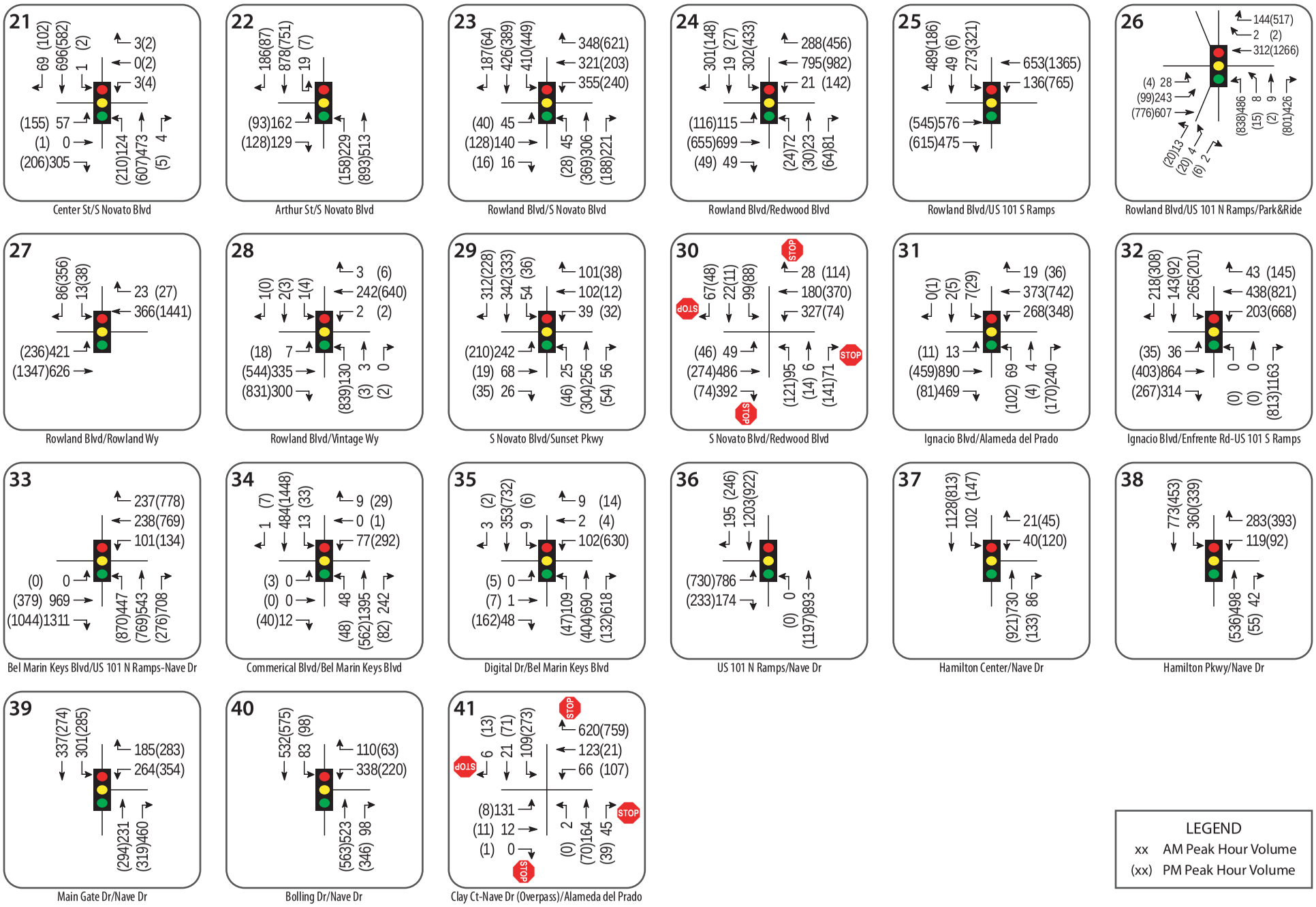

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Figure 3B – Cumulative Traffic Volumes

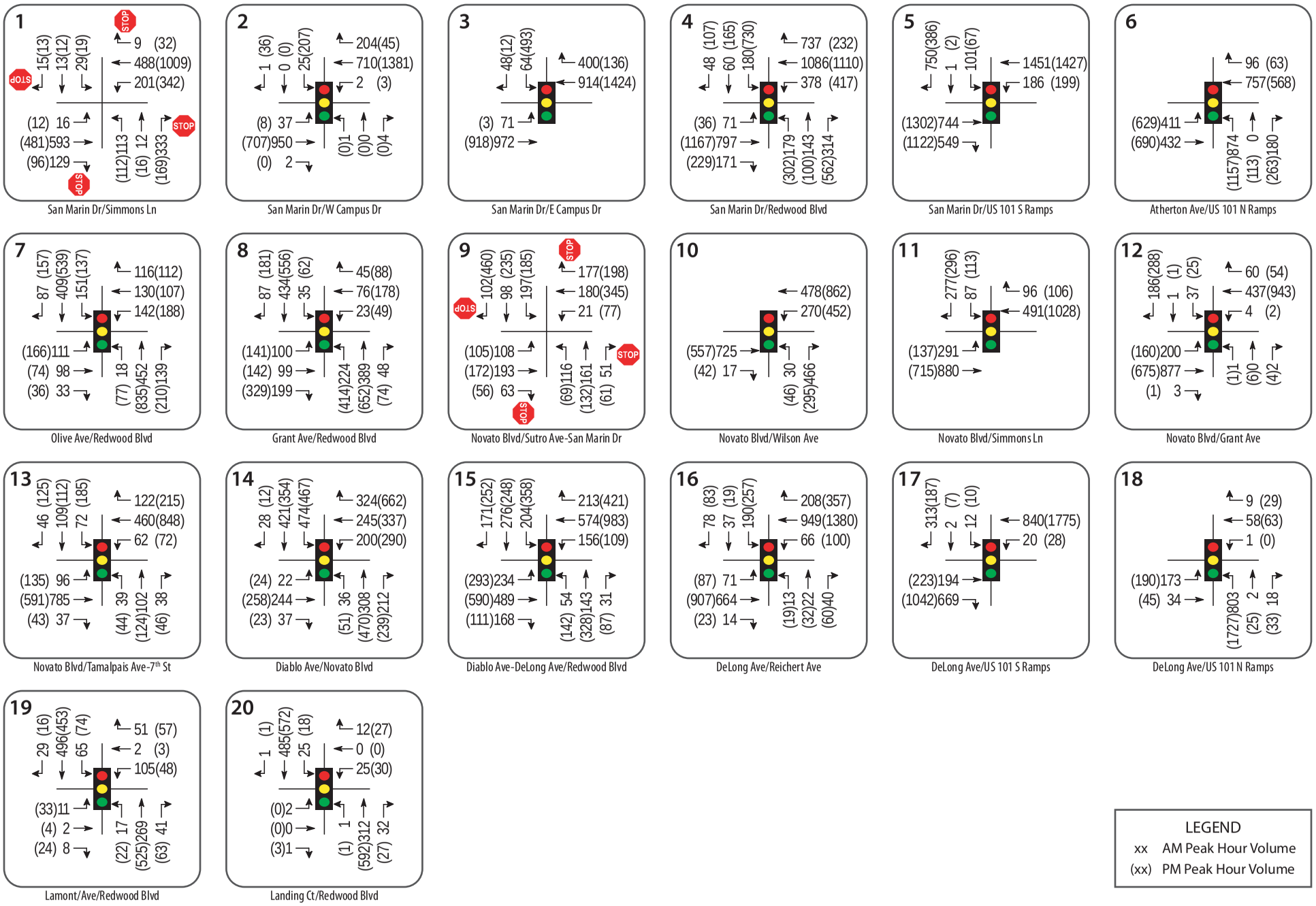

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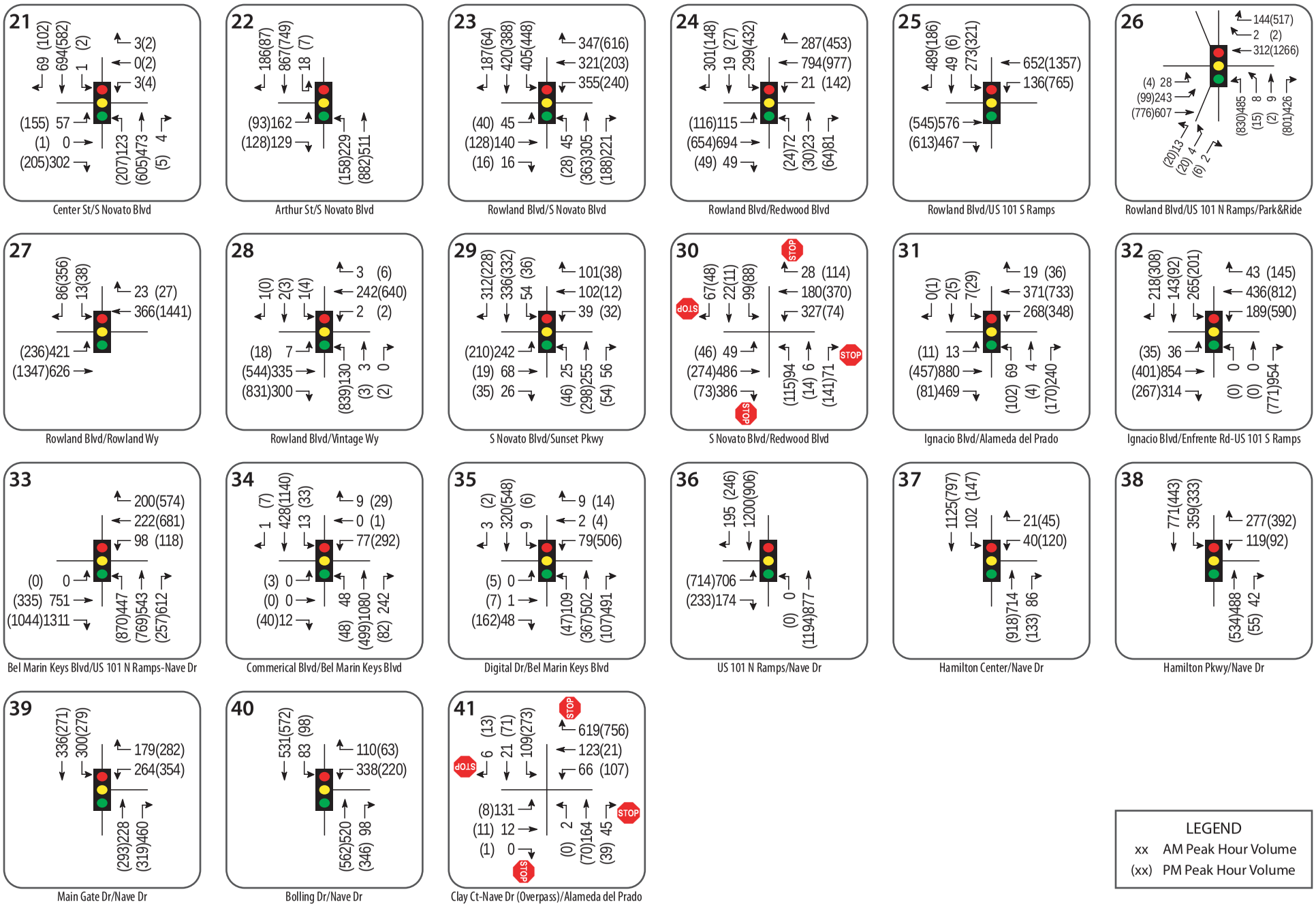
Figure 4A – Cumulative plus Project Alternative Traffic Volumes



Novato General Plan Update EIR

Figure 4B – Cumulative plus Project Alternative Traffic Volumes

Intersection Level of Service Calculations

HCM 2010 AWSC
1: Simmons Ln & San Marin Dr 02/15/2018

Intersection	
Intersection Delay, s/veh	29.9
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	15	469	116	183	430	7	105	11	296	25	11	14
Future Vol, veh/h	15	469	116	183	430	7	105	11	296	25	11	14
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	16	504	125	197	462	8	113	12	318	27	12	15
Number of Lanes	1	2	0	1	2	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	3	3
HCM Control Delay	35.5	26	29.5	15.7
HCM LOS	E	D	D	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1
Vol Left, %	91%	0%	100%	0%	0%	100%	0%	0%	50%
Vol Thru, %	9%	0%	0%	100%	57%	0%	100%	95%	22%
Vol Right, %	0%	100%	0%	0%	43%	0%	0%	5%	28%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	116	296	15	313	272	183	287	150	50
LT Vol	105	0	15	0	0	183	0	0	25
Through Vol	11	0	0	313	156	0	287	143	11
RT Vol	0	296	0	0	116	0	0	7	14
Lane Flow Rate	125	318	16	336	293	197	308	162	54
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.339	0.761	0.042	0.828	0.696	0.508	0.751	0.392	0.162
Departure Headway (Hd)	9.777	8.602	9.385	8.866	8.557	9.287	8.768	8.734	10.829
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	368	420	381	407	422	388	413	412	331
Service Time	7.546	6.371	7.149	6.63	6.321	7.046	6.527	6.493	8.616
HCM Lane V/C Ratio	0.34	0.757	0.042	0.826	0.694	0.508	0.746	0.393	0.163
HCM Control Delay	17.5	34.2	12.6	42.4	28.8	21.3	33.7	17	15.7
HCM Lane LOS	C	D	B	E	D	C	D	C	C
HCM 95th-tile Q	1.5	6.3	0.1	7.7	5.2	2.8	6.1	1.8	0.6

HCM Signalized Intersection Capacity Analysis
2: W Campus Dr & San Marin Dr 02/15/2018

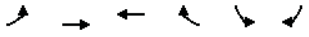
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	795	2	2	620	72	1	0	4	5	0	0
Future Volume (vph)	12	795	2	2	620	72	1	0	4	5	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.8		4.0	4.8	4.8		4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00		0.95	0.95	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	
Frt	1.00	1.00		1.00	1.00	0.85		0.89		1.00	1.00	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99		0.95	0.95	
Satd. Flow (prot)	1805	3573		1805	3574	1615		1678		1715	1715	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		1.00		1.00	1.00	
Satd. Flow (perm)	1805	3573		1805	3574	1615		1695		1805	1805	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	13	864	2	2	674	78	1	0	4	5	0	0
RTOR Reduction (vph)	0	0	0	0	0	38	0	5	0	0	0	0
Lane Group Flow (vph)	13	866	0	2	674	40	0	0	0	2	3	0
Confl. Peds. (#/hr)			2									
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8			4		4
Actuated Green, G (s)	0.8	15.1		0.8	15.1	15.1		0.8		0.8	0.8	
Effective Green, g (s)	0.8	15.1		0.8	15.1	15.1		0.8		0.8	0.8	
Actuated g/C Ratio	0.03	0.51		0.03	0.51	0.51		0.03		0.03	0.03	
Clearance Time (s)	4.0	4.8		4.0	4.8	4.8		4.0		4.0	4.0	
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0		2.0		2.0	2.0	
Lane Grp Cap (vph)	48	1828		48	1829	826		45		48	48	
v/s Ratio Prot	c0.01	c0.24		0.00	0.19							
v/s Ratio Perm						0.02		0.00		0.00	c0.00	
v/c Ratio	0.27	0.47		0.04	0.37	0.05		0.00		0.04	0.06	
Uniform Delay, d1	14.1	4.6		14.0	4.3	3.6		14.0		14.0	14.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	
Incremental Delay, d2	1.1	0.3		0.1	0.2	0.0		0.0		0.1	0.2	
Delay (s)	15.2	4.9		14.1	4.5	3.6		14.0		14.1	14.2	
Level of Service	B	A		B	A	A		B		B	B	
Approach Delay (s)		5.1			4.4			14.0			14.2	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	4.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	29.5	Sum of lost time (s)	12.8
Intersection Capacity Utilization	37.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: San Marin Dr & E Campus Drive

02/15/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	806	693	5	2	0
Future Volume (vph)	0	806	693	5	2	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.3	4.3	4.3	3.0	
Lane Util. Factor		0.95	0.95	1.00	0.97	
Frpb, ped/bikes		1.00	1.00	1.00	1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00	
Frt		1.00	1.00	0.85	1.00	
Flt Protected		1.00	1.00	1.00	0.95	
Satd. Flow (prot)		3574	3574	1615	3502	
Flt Permitted		1.00	1.00	1.00	0.95	
Satd. Flow (perm)		3574	3574	1615	3502	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	876	753	5	2	0
RTOR Reduction (vph)	0	0	0	1	0	0
Lane Group Flow (vph)	0	876	753	4	2	0
Confl. Peds. (#/hr)						1
Heavy Vehicles (%)	0%	1%	1%	0%	0%	0%
Turn Type	Prot	NA	NA	Perm	Perm	Perm
Protected Phases	5	2	6			
Permitted Phases				6	4	4
Actuated Green, G (s)		116.3	116.3	116.3	6.4	
Effective Green, g (s)		116.3	116.3	116.3	6.4	
Actuated g/C Ratio		0.89	0.89	0.89	0.05	
Clearance Time (s)		4.3	4.3	4.3	3.0	
Vehicle Extension (s)		4.0	4.0	4.0	2.0	
Lane Grp Cap (vph)		3197	3197	1444	172	
v/s Ratio Prot		c0.25	0.21			
v/s Ratio Perm				0.00	c0.00	
v/c Ratio		0.27	0.24	0.00	0.01	
Uniform Delay, d1		1.0	0.9	0.7	58.8	
Progression Factor		1.00	0.73	0.92	1.00	
Incremental Delay, d2		0.2	0.1	0.0	0.0	
Delay (s)		1.2	0.7	0.7	58.8	
Level of Service		A	A	A	E	
Approach Delay (s)		1.2	0.7		58.8	
Approach LOS		A	A		E	

Intersection Summary				
HCM 2000 Control Delay	1.0	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.27			
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	10.3	
Intersection Capacity Utilization	34.9%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
4: Redwood Blvd & San Marin Dr

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	637	145	280	550	245	115	56	245	43	29	32
Future Volume (vph)	29	637	145	280	550	245	115	56	245	43	29	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.6		3.0	4.0		4.3	4.3	4.3	4.3	4.3	
Lane Util. Factor	1.00	0.91		1.00	0.91		0.97	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	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	1.00	
Frt	1.00	0.97		1.00	0.95		1.00	1.00	0.85	1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1787	4978		1752	4898		3467	1881	1568	1787	1717	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1787	4978		1752	4898		3467	1881	1568	1787	1717	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	31	671	153	295	579	258	121	59	258	45	31	34
RTOR Reduction (vph)	0	25	0	0	37	0	0	0	236	0	30	0
Lane Group Flow (vph)	31	799	0	295	800	0	121	59	22	45	35	0
Confl. Peds. (#/hr)			4									5
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	1%	1%	1%	3%	1%	1%	1%	1%	3%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA		Split	NA	Perm	Split	NA	
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases					2				7			
Actuated Green, G (s)	6.0	55.8		34.4	83.8		11.0	11.0	11.0	13.6	13.6	
Effective Green, g (s)	6.0	55.8		34.4	83.8		11.0	11.0	11.0	13.6	13.6	
Actuated g/C Ratio	0.05	0.43		0.26	0.64		0.08	0.08	0.08	0.10	0.10	
Clearance Time (s)	3.0	3.6		3.0	4.0		4.3	4.3	4.3	4.3	4.3	
Vehicle Extension (s)	2.0	4.0		5.0	4.0		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	82	2136		463	3157		293	159	132	186	179	
v/s Ratio Prot	0.02	c0.16		c0.17	0.16		c0.03	0.03		c0.03	0.02	
v/s Ratio Perm									0.01			
v/c Ratio	0.38	0.37		0.64	0.25		0.41	0.37	0.17	0.24	0.19	
Uniform Delay, d1	60.2	25.2		42.3	9.8		56.4	56.2	55.2	53.5	53.2	
Progression Factor	1.19	0.91		1.05	1.01		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.0	0.5		3.8	0.2		0.3	0.5	0.2	0.2	0.2	
Delay (s)	72.8	23.5		48.1	10.1		56.8	56.8	55.5	53.7	53.4	
Level of Service	E	C		D	B		E	E	E	D	D	
Approach Delay (s)		25.3			20.0			56.0			53.5	
Approach LOS		C			B			E			D	

Intersection Summary				
HCM 2000 Control Delay	29.5	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.44			
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	15.6	
Intersection Capacity Utilization	75.6%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
5: US 101 SB Ramps & San Marin Dr

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	564	363	117	634	0	0	0	0	92	1	441
Future Volume (vph)	0	564	363	117	634	0	0	0	0	92	1	441
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9	4.9	3.0	5.3						4.0	4.0
Lane Util. Factor		0.95	1.00	1.00	0.95						1.00	0.88
Frpb, ped/bikes		1.00	0.99	1.00	1.00						1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		3574	1575	1805	3574						1810	2814
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		3574	1575	1805	3574						1810	2814
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)	0	600	386	124	674	0	0	0	0	98	1	469
RTOR Reduction (vph)	0	0	166	0	0	0	0	0	0	0	0	384
Lane Group Flow (vph)	0	600	220	124	674	0	0	0	0	0	99	85
Confl. Peds. (#/hr)			4									
Heavy Vehicles (%)	0%	1%	1%	0%	1%	0%	0%	0%	0%	0%	0%	1%
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			2									4
Actuated Green, G (s)		37.1	37.1	7.8	47.5						8.2	8.2
Effective Green, g (s)		37.1	37.1	7.8	47.5						8.2	8.2
Actuated g/C Ratio		0.57	0.57	0.12	0.73						0.13	0.13
Clearance Time (s)		4.9	4.9	3.0	5.3						4.0	4.0
Vehicle Extension (s)		4.0	4.0	2.0	4.0						2.0	2.0
Lane Grp Cap (vph)		2039	898	216	2611						228	354
v/s Ratio Prot		c0.17		c0.07	0.19						c0.05	
v/s Ratio Perm			0.14									0.03
v/c Ratio		0.29	0.25	0.57	0.26						0.43	0.24
Uniform Delay, d1		7.2	7.0	27.0	2.9						26.3	25.6
Progression Factor		0.70	1.79	1.00	1.00						1.00	1.00
Incremental Delay, d2		0.3	0.6	2.3	0.2						0.5	0.1
Delay (s)		5.3	13.1	29.3	3.1						26.7	25.7
Level of Service		A	B	C	A						C	C
Approach Delay (s)		8.4			7.2			0.0			25.9	
Approach LOS		A			A			A			C	

Intersection Summary				
HCM 2000 Control Delay	12.2	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.36			
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	11.9	
Intersection Capacity Utilization	45.3%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
6: US 101 NB Ramps & San Marin Dr

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	335	318	0	0	332	86	413	0	140	0	0	0
Future Volume (vph)	335	318	0	0	332	86	413	0	140	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.6			4.9	4.9	3.5	3.5				
Lane Util. Factor	0.97	1.00			0.95	1.00	0.95	0.95				
Frpb, ped/bikes	1.00	1.00			1.00	0.99	1.00	0.99				
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00				
Frt	1.00	1.00			1.00	0.85	1.00	0.92				
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.98				
Satd. Flow (prot)	3467	1881			3574	1594	1681	1567				
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.98				
Satd. Flow (perm)	3467	1881			3574	1594	1681	1567				
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	353	335	0	0	349	91	435	0	147	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	68	0	73	0	0	0	0
Lane Group Flow (vph)	353	335	0	0	349	23	300	209	0	0	0	0
Confl. Peds. (#/hr)			3			1			1	1		
Heavy Vehicles (%)	1%	1%	0%	0%	1%	0%	2%	0%	3%	0%	0%	0%
Turn Type	Prot	NA			NA	Perm	Split	NA				
Protected Phases	5	2			6		8	8				
Permitted Phases						6						
Actuated Green, G (s)	9.5	25.0			11.7	11.7	13.2	13.2				
Effective Green, g (s)	9.5	25.0			11.7	11.7	13.2	13.2				
Actuated g/C Ratio	0.21	0.54			0.25	0.25	0.29	0.29				
Clearance Time (s)	3.5	4.6			4.9	4.9	3.5	3.5				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	2.5	2.5				
Lane Grp Cap (vph)	711	1015			903	402	479	446				
v/s Ratio Prot	c0.10	c0.18			0.10		c0.18	0.13				
v/s Ratio Perm						0.01						
v/c Ratio	0.50	0.33			0.39	0.06	0.63	0.47				
Uniform Delay, d1	16.3	6.0			14.3	13.1	14.4	13.7				
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00				
Incremental Delay, d2	0.2	0.3			0.4	0.1	2.2	0.6				
Delay (s)	16.5	6.2			14.7	13.2	16.6	14.2				
Level of Service	B	A			B	B	B	B				
Approach Delay (s)		11.5			14.4			15.5			0.0	
Approach LOS		B			B			B			A	

Intersection Summary				
HCM 2000 Control Delay	13.6	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.52			
Actuated Cycle Length (s)	46.3	Sum of lost time (s)	11.9	
Intersection Capacity Utilization	45.3%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
7: Redwood Blvd & Olive St

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	84	93	26	85	124	80	14	312	93	137	313	63
Future Volume (vph)	84	93	26	85	124	80	14	312	93	137	313	63
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.1	5.1			5.1		4.0	3.9	3.9	4.0	3.9	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.97			0.96		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00			0.99		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1802			1767		1770	3539	1583	1770	3451	
Flt Permitted	0.95	1.00			0.99		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1802			1767		1770	3539	1583	1770	3451	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	91	101	28	92	135	87	15	339	101	149	340	68
RTOR Reduction (vph)	0	10	0	0	13	0	0	0	79	0	13	0
Lane Group Flow (vph)	91	119	0	0	301	0	15	339	22	149	395	0
Turn Type	Split	NA		Split	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	11.2	11.2			15.8		1.3	15.9	15.9	11.5	26.1	
Effective Green, g (s)	11.2	11.2			15.8		1.3	15.9	15.9	11.5	26.1	
Actuated g/C Ratio	0.15	0.15			0.22		0.02	0.22	0.22	0.16	0.36	
Clearance Time (s)	5.1	5.1			5.1		4.0	3.9	3.9	4.0	3.9	
Vehicle Extension (s)	1.0	1.0			1.0		1.0	1.0	1.0	1.0	1.0	
Lane Grp Cap (vph)	273	278			385		31	776	347	280	1242	
v/s Ratio Prot	0.05	c0.07			c0.17		0.01	c0.10		c0.08	0.11	
v/s Ratio Perm									0.01			
v/c Ratio	0.33	0.43			0.78		0.48	0.44	0.06	0.53	0.32	
Uniform Delay, d1	27.3	27.7			26.7		35.3	24.4	22.4	28.0	16.8	
Progression Factor	1.00	1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.3	0.4			9.3		4.3	0.1	0.0	1.0	0.1	
Delay (s)	27.6	28.1			36.0		39.5	24.6	22.4	29.0	16.8	
Level of Service	C	C			D		D	C	C	C	B	
Approach Delay (s)		27.9			36.0			24.6			20.1	
Approach LOS		C			D			C			C	

Intersection Summary				
HCM 2000 Control Delay	25.8	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.56			
Actuated Cycle Length (s)	72.5	Sum of lost time (s)	18.1	
Intersection Capacity Utilization	52.7%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
8: Redwood Blvd & Grant Ave

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	52	89	105	12	69	21	159	275	35	27	296	58
Future Volume (vph)	52	89	105	12	69	21	159	275	35	27	296	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5		3.5	3.7	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	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		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1763	1900	1564	1804	1900	1587	1805	3473		1805	3441	
Flt Permitted	0.71	1.00	1.00	0.69	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1313	1900	1564	1317	1900	1587	1805	3473		1805	3441	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	57	98	115	13	76	23	175	302	38	30	325	64
RTOR Reduction (vph)	0	0	89	0	0	18	0	7	0	0	15	0
Lane Group Flow (vph)	57	98	26	13	76	5	175	333	0	30	374	0
Confl. Peds. (#/hr)	9		11	2		1			10			9
Confl. Bikes (#/hr)			5			5			5			5
Heavy Vehicles (%)	2%	0%	1%	0%	0%	0%	0%	2%	0%	0%	2%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8		8	4		4						
Actuated Green, G (s)	13.3	13.3	13.3	13.3	13.3	13.3	14.9	31.2		2.6	18.7	
Effective Green, g (s)	13.3	13.3	13.3	13.3	13.3	13.3	14.9	31.2		2.6	18.7	
Actuated g/C Ratio	0.23	0.23	0.23	0.23	0.23	0.23	0.26	0.54		0.04	0.32	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5		3.5	3.7	
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0	4.0	2.5	3.0		2.5	3.0	
Lane Grp Cap (vph)	300	434	358	301	434	363	462	1865		80	1107	
v/s Ratio Prot		c0.05			0.04		c0.10	0.10		0.02	c0.11	
v/s Ratio Perm	0.04		0.02	0.01		0.00						
v/c Ratio	0.19	0.23	0.07	0.04	0.18	0.01	0.38	0.18		0.38	0.34	
Uniform Delay, d1	18.1	18.2	17.6	17.4	18.0	17.3	17.8	6.9		27.0	15.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.4	0.1	0.1	0.3	0.0	0.4	0.0		2.1	0.2	
Delay (s)	18.5	18.6	17.7	17.5	18.3	17.4	18.2	6.9		29.1	15.2	
Level of Service	B	B	B	B	B	B	B	A		C	B	
Approach Delay (s)		18.2			18.0			10.8			16.2	
Approach LOS		B			B			B			B	

Intersection Summary				
HCM 2000 Control Delay	14.6	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.32			
Actuated Cycle Length (s)	58.1	Sum of lost time (s)	11.2	
Intersection Capacity Utilization	49.6%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM 2010 AWSC
9: San Marin Dr/Sutro Ave & Novato Blvd 02/15/2018

Intersection	
Intersection Delay, s/veh	23.8
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	48	128	60	20	163	138	110	153	49	143	93	91
Future Vol, veh/h	48	128	60	20	163	138	110	153	49	143	93	91
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	56	151	71	24	192	162	129	180	58	168	109	107
Number of Lanes	1	1	0	1	1	0	1	1	0	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	3	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	3	2	2
HCM Control Delay	20	37.5	20.4	16.3
HCM LOS	C	E	C	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%	0%
Vol Thru, %	0%	76%	0%	68%	0%	54%	0%	100%	0%
Vol Right, %	0%	24%	0%	32%	0%	46%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	110	202	48	188	20	301	143	93	91
LT Vol	110	0	48	0	20	0	143	0	0
Through Vol	0	153	0	128	0	163	0	93	0
RT Vol	0	49	0	60	0	138	0	0	91
Lane Flow Rate	129	238	56	221	24	354	168	109	107
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.336	0.57	0.15	0.541	0.06	0.818	0.436	0.268	0.241
Departure Headway (Hd)	9.337	8.641	9.545	8.798	9.162	8.319	9.333	8.816	8.091
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	384	416	375	409	390	436	385	407	443
Service Time	7.109	6.412	7.317	6.57	6.929	6.085	7.104	6.586	5.861
HCM Lane V/C Ratio	0.336	0.572	0.149	0.54	0.062	0.812	0.436	0.268	0.242
HCM Control Delay	16.8	22.3	14	21.5	12.5	39.2	19.2	14.8	13.4
HCM Lane LOS	C	C	B	C	B	E	C	B	B
HCM 95th-tile Q	1.5	3.4	0.5	3.1	0.2	7.6	2.1	1.1	0.9

HCM Signalized Intersection Capacity Analysis
10: Wilson Ave & Novato Blvd 02/15/2018

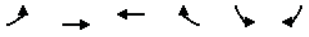
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	574	16	248	403	26	424
Future Volume (vph)	574	16	248	403	26	424
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.9		3.0	3.6	3.6	3.6
Lane Util. Factor	0.95		1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3558		1787	3610	1805	1593
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3558		1787	3610	1805	1593
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	675	19	292	474	31	499
RTOR Reduction (vph)	2	0	0	0	0	242
Lane Group Flow (vph)	692	0	292	474	31	257
Confl. Peds. (#/hr)		3			6	2
Heavy Vehicles (%)	1%	0%	1%	0%	0%	0%
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases						4
Actuated Green, G (s)	32.1		20.3	42.7	17.1	17.1
Effective Green, g (s)	32.1		20.3	42.7	17.1	17.1
Actuated g/C Ratio	0.40		0.25	0.53	0.21	0.21
Clearance Time (s)	3.9		3.0	3.6	3.6	3.6
Vehicle Extension (s)	3.0		2.0	3.0	2.0	2.0
Lane Grp Cap (vph)	1427		453	1926	385	340
v/s Ratio Prot	c0.19		c0.16	0.13	0.02	
v/s Ratio Perm						c0.16
v/c Ratio	0.48		0.64	0.25	0.08	0.76
Uniform Delay, d1	17.8		26.6	10.0	25.2	29.5
Progression Factor	1.00		0.90	0.56	1.00	1.00
Incremental Delay, d2	1.2		2.3	0.3	0.0	8.2
Delay (s)	19.0		26.2	5.9	25.2	37.7
Level of Service	B		C	A	C	D
Approach Delay (s)	19.0			13.6	37.0	
Approach LOS	B			B	D	

Intersection Summary			
HCM 2000 Control Delay	21.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.5
Intersection Capacity Utilization	51.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
11: Novato Blvd & Simmons Ln

02/15/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	269	709	408	81	69	263
Future Volume (vph)	269	709	408	81	69	263
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.9	3.6		3.0	3.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	3574	3508		1805	1599
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1805	3574	3508		1805	1599
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	316	834	480	95	81	309
RTOR Reduction (vph)	0	0	15	0	0	241
Lane Group Flow (vph)	316	834	560	0	81	68
Confl. Peds. (#/hr)					2	
Confl. Bikes (#/hr)				1		
Heavy Vehicles (%)	0%	1%	0%	0%	0%	1%
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	5	2	6		8	
Permitted Phases						8
Actuated Green, G (s)	10.0	32.1	42.7		17.7	17.7
Effective Green, g (s)	10.0	32.1	42.7		17.7	17.7
Actuated g/C Ratio	0.12	0.40	0.53		0.22	0.22
Clearance Time (s)	3.0	3.9	3.6		3.0	3.0
Vehicle Extension (s)	2.0	3.0	3.0		2.0	2.0
Lane Grp Cap (vph)	225	1434	1872		399	353
v/s Ratio Prot	c0.18	c0.23	c0.16		c0.04	
v/s Ratio Perm						0.04
v/c Ratio	1.40	0.58	0.30		0.20	0.19
Uniform Delay, d1	35.0	18.7	10.3		25.4	25.3
Progression Factor	0.80	0.64	1.00		1.00	1.00
Incremental Delay, d2	203.1	1.5	0.4		0.1	0.1
Delay (s)	231.1	13.5	10.8		25.5	25.4
Level of Service	F	B	B		C	C
Approach Delay (s)		73.3	10.8		25.5	
Approach LOS		E	B		C	

Intersection Summary				
HCM 2000 Control Delay	47.5	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.51			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.5	
Intersection Capacity Utilization	43.8%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
12: Novato Blvd & Grant Ave

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	182	676	3	4	342	57	1	0	2	35	1	167
Future Volume (vph)	182	676	3	4	342	57	1	0	2	35	1	167
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.5	4.5	3.5	4.9	4.9		4.0		3.5	3.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00		1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.96		0.97		1.00	0.98	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00		1.00		0.98	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.91		1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.98		0.95	1.00	
Satd. Flow (prot)	1787	1863	1576	1805	3539	1534		1644		1748	1570	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.80		0.76	1.00	
Satd. Flow (perm)	1787	1863	1576	1805	3539	1534		1335		1390	1570	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	214	795	4	5	402	67	1	0	2	41	1	196
RTOR Reduction (vph)	0	0	1	0	0	26	0	3	0	0	174	0
Lane Group Flow (vph)	214	795	3	5	402	41	0	0	0	41	23	0
Confl. Peds. (#/hr)			1			8	5		12	12		5
Confl. Bikes (#/hr)			4			2			2			1
Heavy Vehicles (%)	1%	2%	0%	0%	2%	1%	0%	0%	0%	1%	0%	1%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8			4		
Actuated Green, G (s)	15.6	76.0	76.0	1.2	61.2	61.2		10.8		11.3	11.3	
Effective Green, g (s)	15.6	76.0	76.0	1.2	61.2	61.2		10.8		11.3	11.3	
Actuated g/C Ratio	0.16	0.76	0.76	0.01	0.61	0.61		0.11		0.11	0.11	
Clearance Time (s)	3.5	4.5	4.5	3.5	4.9	4.9		4.0		3.5	3.5	
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0	3.0		2.0		2.0	2.0	
Lane Grp Cap (vph)	278	1415	1197	21	2165	938		144		157	177	
v/s Ratio Prot	c0.12	c0.43		0.00	0.11						0.01	
v/s Ratio Perm			0.00			0.03		0.00		c0.03		
v/c Ratio	0.77	0.56	0.00	0.24	0.19	0.04		0.00		0.26	0.13	
Uniform Delay, d1	40.5	5.0	2.9	48.9	8.5	7.7		39.8		40.5	39.9	
Progression Factor	1.00	1.00	1.00	0.91	0.85	0.62		1.00		1.00	1.00	
Incremental Delay, d2	11.0	0.5	0.0	2.1	0.2	0.1		0.0		0.3	0.1	
Delay (s)	51.4	5.5	2.9	46.7	7.4	4.9		39.8		40.9	40.1	
Level of Service	D	A	A	D	A	A		D		D	D	
Approach Delay (s)		15.2			7.5			39.8			40.2	
Approach LOS		B			A			D			D	

Intersection Summary				
HCM 2000 Control Delay	16.6	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)	12.4	
Intersection Capacity Utilization	63.7%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
13: Tamalpais Ave/7th St & Novato Blvd

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	85	595	35	58	375	116	35	97	27	68	104	40
Future Volume (vph)	85	595	35	58	375	116	35	97	27	68	104	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.0		3.5	5.0	5.0	3.5	3.5		3.5	3.5	3.5
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.95	1.00	0.99		1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.99	1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1787	1843		1787	1863	1523	1770	1809		1784	1881	1531
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.57	1.00		0.50	1.00	1.00
Satd. Flow (perm)	1787	1843		1787	1863	1523	1068	1809		947	1881	1531
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)	90	633	37	62	399	123	37	103	29	72	111	43
RTOR Reduction (vph)	0	1	0	0	0	22	0	12	0	0	0	37
Lane Group Flow (vph)	90	669	0	62	399	101	37	120	0	72	111	6
Confl. Peds. (#/hr)			11			17	6		1	1		6
Confl. Bikes (#/hr)			9			1			1			4
Heavy Vehicles (%)	1%	2%	1%	1%	2%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8			4		4
Actuated Green, G (s)	8.9	66.9		7.7	65.7	65.7	13.4	13.4		13.4	13.4	13.4
Effective Green, g (s)	8.9	66.9		7.7	65.7	65.7	13.4	13.4		13.4	13.4	13.4
Actuated g/C Ratio	0.09	0.67		0.08	0.66	0.66	0.13	0.13		0.13	0.13	0.13
Clearance Time (s)	3.5	5.0		3.5	5.0	5.0	3.5	3.5		3.5	3.5	3.5
Vehicle Extension (s)	2.0	5.0		2.0	5.0	5.0	2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	159	1232		137	1223	1000	143	242		126	252	205
v/s Ratio Prot	c0.05	c0.36		0.03	0.21			0.07			0.06	
v/s Ratio Perm						0.07	0.03			c0.08		0.00
v/c Ratio	0.57	0.54		0.45	0.33	0.10	0.26	0.50		0.57	0.44	0.03
Uniform Delay, d1	43.7	8.6		44.1	7.5	6.3	38.8	40.2		40.6	39.8	37.6
Progression Factor	0.88	1.16		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	2.4	1.5		0.9	0.7	0.2	0.4	0.6		3.8	0.4	0.0
Delay (s)	40.9	11.5		45.0	8.2	6.5	39.2	40.7		44.5	40.3	37.7
Level of Service	D	B		D	A	A	D	D		D	D	D
Approach Delay (s)		15.0			11.7			40.4			41.1	
Approach LOS		B			B			D			D	

Intersection Summary				
HCM 2000 Control Delay	19.8	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.55			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	71.9%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
14: Novato Blvd & Diablo Ave

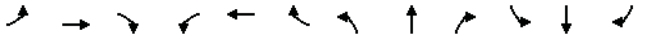
02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	216	35	174	224	267	34	273	195	348	345	25
Future Volume (vph)	21	216	35	174	224	267	34	273	195	348	345	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	11	11	12	11	11	12	12	12	12
Total Lost time (s)		3.7		4.1	4.1	4.1	4.4	4.4	4.4	4.1	4.1	
Lane Util. Factor		0.95		0.91	0.91	1.00	1.00	1.00	1.00	0.91	0.91	
Frpb, ped/bikes		1.00		1.00	1.00	0.96	1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes		1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected		1.00		0.95	0.99	1.00	0.95	1.00	1.00	0.95	0.99	
Satd. Flow (prot)		3482		1557	3277	1515	1728	1801	1557	1610	3323	
Flt Permitted		1.00		0.95	0.99	1.00	0.95	1.00	1.00	0.95	0.99	
Satd. Flow (perm)		3482		1557	3277	1515	1728	1801	1557	1610	3323	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	21	220	36	178	229	272	35	279	199	355	352	26
RTOR Reduction (vph)	0	9	0	0	0	198	0	0	153	0	3	0
Lane Group Flow (vph)	0	268	0	132	275	74	35	279	46	241	489	0
Confl. Peds. (#/hr)			7			15			2			4
Confl. Bikes (#/hr)			1			1			3			5
Heavy Vehicles (%)	1%	1%	1%	2%	1%	2%	1%	2%	2%	2%	2%	1%
Turn Type	Split	NA		Split	NA	Perm	Split	NA	Perm	Split	NA	
Protected Phases	3	3		4	4		1	1		2	2	
Permitted Phases						4			1		2	
Actuated Green, G (s)		13.8		13.9	13.9	13.9	18.5	18.5	18.5	18.1	18.1	
Effective Green, g (s)		13.8		13.9	13.9	13.9	18.5	18.5	18.5	18.1	18.1	
Actuated g/C Ratio		0.17		0.17	0.17	0.17	0.23	0.23	0.23	0.22	0.22	
Clearance Time (s)		3.7		4.1	4.1	4.1	4.4	4.4	4.4	4.1	4.1	
Vehicle Extension (s)		2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)		596		268	565	261	396	413	357	361	746	
v/s Ratio Prot		c0.08		c0.08	0.08		0.02	c0.15		c0.15	0.15	
v/s Ratio Perm						0.05			0.03			
v/c Ratio		0.45		0.49	0.49	0.28	0.09	0.68	0.13	0.67	0.66	
Uniform Delay, d1		30.0		30.2	30.1	29.0	24.4	28.3	24.6	28.5	28.4	
Progression Factor		1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.2		0.5	0.2	0.2	0.0	3.4	0.1	3.6	1.6	
Delay (s)		30.2		30.7	30.4	29.2	24.5	31.7	24.7	32.1	30.0	
Level of Service		C		C	C	C	C	C	C	C	C	
Approach Delay (s)		30.2			30.0			28.5			30.7	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM 2000 Control Delay	29.9	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.58			
Actuated Cycle Length (s)	80.6	Sum of lost time (s)	16.3	
Intersection Capacity Utilization	67.2%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
15: Redwood Blvd & Diablo Ave/De Long Ave

02/15/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	169	405	146	148	532	135	38	94	29	96	186	125
Future Volume (vph)	169	405	146	148	532	135	38	94	29	96	186	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	9
Total Lost time (s)	5.0	4.0		5.0	4.1		4.0	4.8	4.8	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95	1.00	0.97	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3467	3448		1805	3398		1805	3610	1505	3303	1900	1408
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3467	3448		1805	3398		1805	3610	1505	3303	1900	1408
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	184	440	159	161	578	147	41	102	32	104	202	136
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	15	0	0	58
Lane Group Flow (vph)	184	599	0	161	725	0	41	102	17	104	202	78
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			5			5			5			5
Heavy Vehicles (%)	1%	0%	0%	0%	2%	5%	0%	0%	5%	6%	0%	1%
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)	17.0	48.2		17.0	48.1		10.4	36.0	36.0	11.0	37.4	37.4
Effective Green, g (s)	17.0	48.2		17.0	48.1		10.4	36.0	36.0	11.0	37.4	37.4
Actuated g/C Ratio	0.13	0.37		0.13	0.37		0.08	0.28	0.28	0.08	0.29	0.29
Clearance Time (s)	5.0	4.0		5.0	4.1		4.0	4.8	4.8	4.0	4.0	4.0
Vehicle Extension (s)	2.5	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	453	1278		236	1257		144	999	416	279	546	405
v/s Ratio Prot	0.05	0.17		c0.09	c0.21		0.02	0.03		c0.03	c0.11	
v/s Ratio Perm									0.01			0.06
v/c Ratio	0.41	0.47		0.68	0.58		0.28	0.10	0.04	0.37	0.37	0.19
Uniform Delay, d1	51.9	31.1		53.9	32.8		56.3	35.0	34.4	56.2	36.9	34.9
Progression Factor	1.00	1.00		1.15	0.84		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.4	1.2		5.8	1.8		0.4	0.2	0.2	0.3	1.9	1.1
Delay (s)	52.3	32.4		67.7	29.2		56.7	35.2	34.6	56.5	38.8	36.0
Level of Service	D	C		E	C		E	D	C	E	D	D
Approach Delay (s)		37.1			36.2			40.1			42.1	
Approach LOS		D			D			D			D	

Intersection Summary				
HCM 2000 Control Delay	37.9	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.51			
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	17.9	
Intersection Capacity Utilization	93.2%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
16: Reichert Ave & De Long Ave

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	68	476	9	53	827	191	8	21	24	181	35	74
Future Volume (vph)	68	476	9	53	827	191	8	21	24	181	35	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.1		3.0	4.1		3.5	3.5	3.5	3.5	3.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00	0.98	1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00	1.00	0.99	1.00	
Frt	1.00	1.00		1.00	0.97		1.00	1.00	0.85	1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1805	3528		1805	3454		1793	1900	1578	1778	1676	
Flt Permitted	0.95	1.00		0.95	1.00		0.56	1.00	1.00	0.74	1.00	
Satd. Flow (perm)	1805	3528		1805	3454		1055	1900	1578	1389	1676	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	76	529	10	59	919	212	9	23	27	201	39	82
RTOR Reduction (vph)	0	0	0	0	6	0	0	0	9	0	28	0
Lane Group Flow (vph)	76	539	0	59	1125	0	9	23	18	201	93	0
Confl. Peds. (#/hr)			6			3	6		4	4		6
Confl. Bikes (#/hr)			5			5			5			5
Heavy Vehicles (%)	0%	2%	0%	0%	1%	1%	0%	0%	0%	1%	0%	0%
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	8.9	87.7		8.1	86.9		23.6	23.6	23.6	23.6	23.6	
Effective Green, g (s)	8.9	87.7		8.1	86.9		23.6	23.6	23.6	23.6	23.6	
Actuated g/C Ratio	0.07	0.67		0.06	0.67		0.18	0.18	0.18	0.18	0.18	
Clearance Time (s)	3.0	4.1		3.0	4.1		3.5	3.5	3.5	3.5	3.5	
Vehicle Extension (s)	2.0	3.0		2.0	3.0		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	123	2380		112	2308		191	344	286	252	304	
v/s Ratio Prot	c0.04	0.15		0.03	c0.33			0.01			0.06	
v/s Ratio Perm							0.01		0.01	c0.14		
v/c Ratio	0.62	0.23		0.53	0.49		0.05	0.07	0.06	0.80	0.31	
Uniform Delay, d1	58.9	8.1		59.1	10.6		43.9	44.1	44.0	50.9	46.1	
Progression Factor	1.07	0.87		1.03	0.90		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	5.9	0.2		2.0	0.7		0.0	0.0	0.0	15.0	0.2	
Delay (s)	69.1	7.3		63.1	10.3		44.0	44.1	44.1	65.9	46.3	
Level of Service	E	A		E	B		D	D	D	E	D	
Approach Delay (s)		14.9			12.9			44.1			58.5	
Approach LOS		B			B			D			E	

Intersection Summary				
HCM 2000 Control Delay	21.0	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.56			
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	10.6	
Intersection Capacity Utilization	64.3%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
17: US 101 SB Ramps & De Long Ave

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	182	469	17	704	0	0	0	0	11	2	297
Future Volume (vph)	0	182	469	17	704	0	0	0	0	11	2	297
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.6	3.6	3.0	3.6					4.0	4.0	
Lane Util. Factor		0.95	1.00	1.00	0.95					0.95	0.95	
Frt		1.00	0.85	1.00	1.00					1.00	0.85	
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (prot)		3574	1599	1770	3539					1681	1506	
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (perm)		3574	1599	1770	3539					1681	1506	
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)	0	194	499	18	749	0	0	0	0	12	2	316
RTOR Reduction (vph)	0	0	180	0	0	0	0	0	0	0	163	0
Lane Group Flow (vph)	0	194	319	18	749	0	0	0	0	11	156	0
Heavy Vehicles (%)	0%	1%	1%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type		NA	Perm	Prot	NA					Split	NA	
Protected Phases		6		5	2					4	4	
Permitted Phases			6									
Actuated Green, G (s)		41.6	41.6	1.3	45.9					11.5	11.5	
Effective Green, g (s)		41.6	41.6	1.3	45.9					11.5	11.5	
Actuated g/C Ratio		0.64	0.64	0.02	0.71					0.18	0.18	
Clearance Time (s)		3.6	3.6	3.0	3.6					4.0	4.0	
Vehicle Extension (s)		4.0	4.0	2.0	4.0					2.5	2.5	
Lane Grp Cap (vph)		2287	1023	35	2499					297	266	
v/s Ratio Prot		0.05		c0.01	c0.21					0.01	c0.10	
v/s Ratio Perm			0.20									
v/c Ratio		0.08	0.31	0.51	0.30					0.04	0.59	
Uniform Delay, d1		4.5	5.3	31.5	3.6					22.2	24.6	
Progression Factor		0.81	2.01	1.00	1.00					1.00	1.00	
Incremental Delay, d2		0.1	0.8	5.2	0.3					0.0	2.7	
Delay (s)		3.7	11.4	36.7	3.9					22.2	27.3	
Level of Service		A	B	D	A					C	C	
Approach Delay (s)		9.2			4.6			0.0			27.1	
Approach LOS		A			A			A			C	

Intersection Summary				
HCM 2000 Control Delay	10.6	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.38			
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	10.6	
Intersection Capacity Utilization	51.9%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
18: US 101 NB Ramps & De Long Ave

02/15/2018

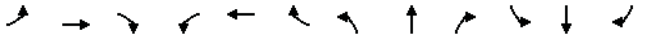
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	161	32	0	1	52	8	670	2	17	0	0	0
Future Volume (vph)	161	32	0	1	52	8	670	2	17	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.6			3.6		4.5	4.5				
Lane Util. Factor	1.00	0.95			0.95		0.95	0.95				
Frt	1.00	1.00			0.98		1.00	0.99				
Flt Protected	0.95	1.00			1.00		0.95	0.95				
Satd. Flow (prot)	1770	3610			3482		1698	1688				
Flt Permitted	0.95	1.00			0.95		0.95	0.95				
Satd. Flow (perm)	1770	3610			3313		1698	1688				
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	183	36	0	1	59	9	761	2	19	0	0	0
RTOR Reduction (vph)	0	0	0	0	8	0	0	2	0	0	0	0
Lane Group Flow (vph)	183	36	0	0	61	0	396	384	0	0	0	0
Heavy Vehicles (%)	2%	0%	0%	0%	0%	12%	1%	0%	8%	0%	0%	0%
Turn Type	Prot	NA			NA		Split	NA				
Protected Phases	1	6			2		4	4				
Permitted Phases												
Actuated Green, G (s)	8.8	16.6			4.3		18.2	18.2				
Effective Green, g (s)	8.8	16.6			4.3		18.2	18.2				
Actuated g/C Ratio	0.21	0.39			0.10		0.42	0.42				
Clearance Time (s)	3.5	3.6			3.6		4.5	4.5				
Vehicle Extension (s)	2.5	2.0			2.0		3.0	3.0				
Lane Grp Cap (vph)	363	1396			332		720	716				
v/s Ratio Prot	c0.10	0.01					c0.23	0.23				
v/s Ratio Perm					c0.02							
v/c Ratio	0.50	0.03			1.00dr		0.55	0.54				
Uniform Delay, d1	15.1	8.1			17.7		9.3	9.2				
Progression Factor	1.00	1.00			1.00		1.00	1.00				
Incremental Delay, d2	0.8	0.0			0.1		0.9	0.8				
Delay (s)	15.9	8.1			17.8		10.2	10.0				
Level of Service	B	A			B		B	A				
Approach Delay (s)		14.6			17.8			10.1			0.0	
Approach LOS		B			B			B			A	

Intersection Summary				
HCM 2000 Control Delay	11.5	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.49			
Actuated Cycle Length (s)	42.9	Sum of lost time (s)	11.6	
Intersection Capacity Utilization	41.8%	ICU Level of Service	A	
Analysis Period (min)	15			

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
19: Redwood Blvd & Lamont Ave

02/15/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	2	8	100	2	49	16	203	39	58	383	28
Future Volume (vph)	10	2	8	100	2	49	16	203	39	58	383	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	3.5		3.5	3.5	3.5	4.8		3.5	4.8	4.8
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes		1.00	1.00		1.00	0.99	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85		1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected		0.96	1.00		0.95	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1822	1615		1811	1595	1805	3510		1805	3610	1615
Flt Permitted		0.84	1.00		0.74	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1599	1615		1405	1595	1805	3510		1805	3610	1615
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	11	2	9	110	2	54	18	223	43	64	421	31
RTOR Reduction (vph)	0	0	7	0	0	39	0	15	0	0	0	17
Lane Group Flow (vph)	0	13	2	0	112	15	18	251	0	64	421	14
Confl. Peds. (#/hr)	1					1			2			
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8		8	4		4						2
Actuated Green, G (s)		12.7	12.7		12.7	12.7	0.9	18.8		3.1	21.0	21.0
Effective Green, g (s)		12.7	12.7		12.7	12.7	0.9	18.8		3.1	21.0	21.0
Actuated g/C Ratio		0.27	0.27		0.27	0.27	0.02	0.41		0.07	0.45	0.45
Clearance Time (s)		3.5	3.5		3.5	3.5	3.5	4.8		3.5	4.8	4.8
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0	3.0		2.0	3.0	3.0
Lane Grp Cap (vph)		437	442		384	436	35	1422		120	1633	730
v/s Ratio Prot							0.01	0.07		c0.04	c0.12	
v/s Ratio Perm		0.01	0.00		c0.08	0.01						0.01
v/c Ratio		0.03	0.01		0.29	0.03	0.51	0.18		0.53	0.26	0.02
Uniform Delay, d1		12.3	12.3		13.3	12.4	22.5	8.8		21.0	7.9	7.0
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		0.0	0.0		0.2	0.0	5.2	0.1		2.3	0.1	0.0
Delay (s)		12.3	12.3		13.5	12.4	27.7	8.9		23.2	8.0	7.0
Level of Service		B	B		B	B	C	A		C	A	A
Approach Delay (s)		12.3			13.1			10.1			9.8	
Approach LOS		B			B			B			A	

Intersection Summary				
HCM 2000 Control Delay	10.5	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.29			
Actuated Cycle Length (s)	46.4	Sum of lost time (s)	11.8	
Intersection Capacity Utilization	41.8%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
20: Redwood Blvd & Landing Ct

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	0	1	15	0	4	1	253	15	10	387	1
Future Volume (vph)	2	0	1	15	0	4	1	253	15	10	387	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5		3.5		3.5		4.8	4.8	3.5	4.8	4.8
Lane Util. Factor		1.00		1.00		1.00		0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes		1.00		1.00		1.00		1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes		1.00		1.00		1.00		1.00	1.00	1.00	1.00	1.00
Frt		0.95		1.00		0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected		0.97		0.95		1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1748		1803		1615		3609	1579	1805	3610	1573
Flt Permitted		0.97		1.00		1.00		0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1748		1898		1615		3444	1579	1805	3610	1573
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2	0	1	16	0	4	1	275	16	11	421	1
RTOR Reduction (vph)	0	3	0	0	0	4	0	0	6	0	0	0
Lane Group Flow (vph)	0	0	0	16	0	0	0	276	10	11	421	1
Confl. Peds. (#/hr)			4	4					3			6
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA		Perm		Perm	Perm	NA	Perm	Prot	NA	Perm
Protected Phases		4						2		1	6	
Permitted Phases	4			8		8	2		2			6
Actuated Green, G (s)		4.0		4.0		4.0		26.2	26.2	0.8	30.5	30.5
Effective Green, g (s)		4.0		4.0		4.0		26.2	26.2	0.8	30.5	30.5
Actuated g/C Ratio		0.09		0.09		0.09		0.61	0.61	0.02	0.71	0.71
Clearance Time (s)		3.5		3.5		3.5		4.8	4.8	3.5	4.8	4.8
Vehicle Extension (s)		3.0		2.0		2.0		4.0	4.0	2.0	4.0	4.0
Lane Grp Cap (vph)		163		177		150		2108	966	33	2572	1120
v/s Ratio Prot										0.01	c0.12	
v/s Ratio Perm		0.00		c0.01		0.00		0.08	0.01			0.00
v/c Ratio		0.00		0.09		0.00		0.13	0.01	0.33	0.16	0.00
Uniform Delay, d1		17.6		17.7		17.6		3.5	3.2	20.7	2.0	1.8
Progression Factor		1.00		1.00		1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.0		0.1		0.0		0.0	0.0	2.2	0.0	0.0
Delay (s)		17.6		17.8		17.6		3.5	3.2	22.9	2.0	1.8
Level of Service		B		B		B		A	A	C	A	A
Approach Delay (s)		17.6			17.8			3.5			2.6	
Approach LOS		B			B			A			A	

Intersection Summary				
HCM 2000 Control Delay	3.4	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.17			
Actuated Cycle Length (s)	42.8	Sum of lost time (s)	11.8	
Intersection Capacity Utilization	38.4%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
21: Novato Blvd & Center Rd/Garden Ct

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	0	272	3	0	3	110	423	4	1	592	66
Future Volume (vph)	54	0	272	3	0	3	110	423	4	1	592	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.2	3.2			3.0		3.0	4.4		3.0	4.4	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.85			0.93		1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1615			1729		1805	3604		1805	3512	
Flt Permitted	0.75	1.00			0.58		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1432	1615			1031		1805	3604		1805	3512	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	59	0	296	3	0	3	120	460	4	1	643	72
RTOR Reduction (vph)	0	263	0	0	5	0	0	0	0	0	5	0
Lane Group Flow (vph)	59	33	0	0	1	0	120	464	0	1	710	0
Confl. Peds. (#/hr)									9			6
Confl. Bikes (#/hr)									2			
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4								
Actuated Green, G (s)	11.1	11.1			11.3		11.9	76.1		2.2	66.4	
Effective Green, g (s)	11.1	11.1			11.3		11.9	76.1		2.2	66.4	
Actuated g/C Ratio	0.11	0.11			0.11		0.12	0.76		0.02	0.66	
Clearance Time (s)	3.2	3.2			3.0		3.0	4.4		3.0	4.4	
Vehicle Extension (s)	3.0	3.0			2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	158	179			116		214	2742		39	2331	
v/s Ratio Prot		0.02					c0.07	0.13		0.00	c0.20	
v/s Ratio Perm	c0.04				0.00							
v/c Ratio	0.37	0.18			0.01		0.56	0.17		0.03	0.30	
Uniform Delay, d1	41.2	40.3			39.4		41.6	3.3		47.9	7.1	
Progression Factor	1.00	1.00			1.00		0.83	1.07		1.00	1.00	
Incremental Delay, d2	1.5	0.5			0.0		2.0	0.1		0.1	0.3	
Delay (s)	42.7	40.8			39.4		36.4	3.6		47.9	7.4	
Level of Service	D	D			D		D	A		D	A	
Approach Delay (s)		41.1			39.4			10.4			7.5	
Approach LOS		D			D			B			A	

Intersection Summary				
HCM 2000 Control Delay	15.8	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.35			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.6	
Intersection Capacity Utilization	54.7%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
22: Novato Blvd & Arthur St

02/15/2018

Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	154	123	218	427	18	698	177
Future Volume (vph)	154	123	218	427	18	698	177
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5	3.5	4.9	3.5	4.9	
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	0.95	
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	0.99	
Flpb, ped/bikes	0.99	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	1.00	0.97	
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1785	1579	1805	3610	1805	3451	
Flt Permitted	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (perm)	1785	1579	1805	3610	1805	3451	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	167	134	237	464	20	759	192
RTOR Reduction (vph)	0	113	0	0	0	16	0
Lane Group Flow (vph)	167	21	237	464	20	935	0
Confl. Peds. (#/hr)	10	8					5
Confl. Bikes (#/hr)		1					
Heavy Vehicles (%)	0%	0%	0%	0%	0%	1%	0%
Turn Type	Perm	Perm	Prot	NA	Prot	NA	
Protected Phases			1	6	5	2	
Permitted Phases	4	4					
Actuated Green, G (s)	15.3	15.3	17.2	70.1	2.7	55.6	
Effective Green, g (s)	15.3	15.3	17.2	70.1	2.7	55.6	
Actuated g/C Ratio	0.15	0.15	0.17	0.70	0.03	0.56	
Clearance Time (s)	3.5	3.5	3.5	4.9	3.5	4.9	
Vehicle Extension (s)	2.0	2.0	2.0	4.0	2.0	4.0	
Lane Grp Cap (vph)	273	241	310	2530	48	1918	
v/s Ratio Prot			c0.13	0.13	0.01	c0.27	
v/s Ratio Perm	c0.09	0.01					
v/c Ratio	0.61	0.09	0.76	0.18	0.42	0.49	
Uniform Delay, d1	39.6	36.3	39.5	5.1	47.9	13.5	
Progression Factor	1.00	1.00	0.99	0.54	1.36	0.71	
Incremental Delay, d2	2.8	0.1	8.7	0.1	2.0	0.9	
Delay (s)	42.4	36.4	47.9	2.9	67.1	10.4	
Level of Service	D	D	D	A	E	B	
Approach Delay (s)	39.7			18.1		11.6	
Approach LOS	D			B		B	

Intersection Summary				
HCM 2000 Control Delay	18.2	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.56			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.9	
Intersection Capacity Utilization	59.7%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
23: Novato Blvd & Rowland Blvd

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	133	15	323	306	292	43	274	184	291	364	178
Future Volume (vph)	43	133	15	323	306	292	43	274	184	291	364	178
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5		3.5	4.1	4.1	3.5	4.1		3.5	4.4	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		0.97	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.99	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	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.94		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1858		1770	1900	1576	1805	1752		3502	1783	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1805	1858		1770	1900	1576	1805	1752		3502	1783	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	45	140	16	340	322	307	45	288	194	306	383	187
RTOR Reduction (vph)	0	5	0	0	0	222	0	21	0	0	14	0
Lane Group Flow (vph)	45	151	0	340	322	85	45	461	0	306	556	0
Confl. Peds. (#/hr)			24			2			13			10
Confl. Bikes (#/hr)			1						1			
Heavy Vehicles (%)	0%	0%	0%	2%	0%	1%	0%	0%	2%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases						4						
Actuated Green, G (s)	5.5	18.4		15.5	27.8	27.8	6.0	38.8		12.7	45.2	
Effective Green, g (s)	5.5	18.4		15.5	27.8	27.8	6.0	38.8		12.7	45.2	
Actuated g/C Ratio	0.06	0.18		0.16	0.28	0.28	0.06	0.39		0.13	0.45	
Clearance Time (s)	3.5	3.5		3.5	4.1	4.1	3.5	4.1		3.5	4.4	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	3.0		2.0	2.0	
Lane Grp Cap (vph)	99	341		274	528	438	108	679		444	805	
v/s Ratio Prot	0.02	0.08		c0.19	c0.17		0.02	0.26		c0.09	c0.31	
v/s Ratio Perm						0.05						
v/c Ratio	0.45	0.44		1.24	0.61	0.19	0.42	0.68		0.69	0.69	
Uniform Delay, d1	45.8	36.2		42.2	31.4	27.6	45.3	25.4		41.8	21.8	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		0.90	0.61	
Incremental Delay, d2	1.2	0.3		135.5	1.4	0.1	0.9	5.4		3.2	4.4	
Delay (s)	47.0	36.6		177.7	32.8	27.6	46.3	30.8		41.0	17.7	
Level of Service	D	D		F	C	C	D	C		D	B	
Approach Delay (s)		38.9			82.0			32.1			25.8	
Approach LOS		D			F			C			C	

Intersection Summary				
HCM 2000 Control Delay	49.3	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.81			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.5	
Intersection Capacity Utilization	85.4%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
24: Redwood Blvd & Rowland Blvd

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	107	549	47	20	713	193	69	22	77	159	18	287
Future Volume (vph)	107	549	47	20	713	193	69	22	77	159	18	287
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.4	4.4	3.5	3.7	3.7	3.5	4.1		3.5	4.8	4.8
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.99	1.00	0.99		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		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1805	3574	1589	1805	3574	1578	1805	3151		3502	1900	1593
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1805	3574	1589	1805	3574	1578	1805	3151		3502	1900	1593
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	120	617	53	22	801	217	78	25	87	179	20	322
RTOR Reduction (vph)	0	0	28	0	0	59	0	74	0	0	0	253
Lane Group Flow (vph)	120	617	25	22	801	158	78	38	0	179	20	69
Confl. Peds. (#/hr)			6			2			3			2
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	0%	1%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						4
Actuated Green, G (s)	11.0	35.7	35.7	3.0	28.4	28.4	8.1	11.1		10.6	12.9	12.9
Effective Green, g (s)	11.0	35.7	35.7	3.0	28.4	28.4	8.1	11.1		10.6	12.9	12.9
Actuated g/C Ratio	0.14	0.47	0.47	0.04	0.37	0.37	0.11	0.15		0.14	0.17	0.17
Clearance Time (s)	3.5	4.4	4.4	3.5	3.7	3.7	3.5	4.1		3.5	4.8	4.8
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	2.0	2.5		2.5	2.5	2.5
Lane Grp Cap (vph)	261	1681	747	71	1337	590	192	460		489	322	270
v/s Ratio Prot	c0.07	0.17		0.01	c0.22		0.04	0.01		c0.05	0.01	
v/s Ratio Perm			0.02			0.10						c0.04
v/c Ratio	0.46	0.37	0.03	0.31	0.60	0.27	0.41	0.08		0.37	0.06	0.25
Uniform Delay, d1	29.7	12.9	10.8	35.4	19.2	16.5	31.7	28.0		29.6	26.4	27.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.5	0.2	0.0	0.9	0.9	0.3	0.5	0.1		0.3	0.1	0.4
Delay (s)	30.2	13.1	10.8	36.4	20.0	16.8	32.2	28.1		29.9	26.5	27.7
Level of Service	C	B	B	D	C	B	C	C		C	C	C
Approach Delay (s)		15.5			19.7			29.7			28.4	
Approach LOS		B			B			C			C	

Intersection Summary				
HCM 2000 Control Delay	20.9	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.48			
Actuated Cycle Length (s)	75.9	Sum of lost time (s)	16.2	
Intersection Capacity Utilization	58.0%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
25: US 101 SB Ramps & Rowland Blvd

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	412	347	55	506	0	0	0	0	221	47	460
Future Volume (vph)	0	412	347	55	506	0	0	0	0	221	47	460
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.6	3.6	3.0	3.6					3.0	3.0	
Lane Util. Factor		0.91	0.91	0.97	0.95					0.91	0.91	
Frpb, ped/bikes		1.00	0.99	1.00	1.00					1.00	0.99	
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	
Frt		0.97	0.85	1.00	1.00					1.00	0.87	
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (prot)		3310	1450	3367	3574					1643	2840	
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (perm)		3310	1450	3367	3574					1643	2840	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	448	377	60	550	0	0	0	0	240	51	500
RTOR Reduction (vph)	0	29	156	0	0	0	0	0	0	0	123	0
Lane Group Flow (vph)	0	543	97	60	550	0	0	0	0	216	452	0
Confl. Peds. (#/hr)			2									2
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	0%	1%	0%	4%	1%	0%	0%	0%	0%	0%	40%	1%
Turn Type		NA	Perm	Prot	NA					Split	NA	
Protected Phases		2		1	6					4	4	
Permitted Phases			2									
Actuated Green, G (s)		15.1	15.1	1.4	19.5					13.1	13.1	
Effective Green, g (s)		15.1	15.1	1.4	19.5					13.1	13.1	
Actuated g/C Ratio		0.39	0.39	0.04	0.50					0.33	0.33	
Clearance Time (s)		3.6	3.6	3.0	3.6					3.0	3.0	
Vehicle Extension (s)		4.0	4.0	2.0	2.5					2.0	2.0	
Lane Grp Cap (vph)		1275	558	120	1777					549	949	
v/s Ratio Prot		c0.16		c0.02	0.15					0.13	c0.16	
v/s Ratio Perm			0.07									
v/c Ratio		0.43	0.17	0.50	0.31					0.39	0.48	
Uniform Delay, d1		8.9	7.9	18.6	5.9					10.0	10.3	
Progression Factor		1.00	1.00	1.00	1.00					1.00	1.00	
Incremental Delay, d2		0.3	0.2	1.2	0.1					0.2	0.1	
Delay (s)		9.2	8.1	19.8	5.9					10.2	10.5	
Level of Service		A	A	B	A					B	B	
Approach Delay (s)		8.9			7.3			0.0			10.4	
Approach LOS		A			A			A			B	

Intersection Summary				
HCM 2000 Control Delay	9.0	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.45			
Actuated Cycle Length (s)	39.2	Sum of lost time (s)	9.6	
Intersection Capacity Utilization	44.6%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
26: US 101 NB Ramps & Rowland Blvd

02/15/2018

Movement	EBL2	EBL	EBT	WBT	WBR	WBR2	NBL2	NBL	NBT	NBR	NEL2	NEL
Lane Configurations												
Traffic Volume (vph)	26	177	430	147	1	96	416	7	8	319	12	3
Future Volume (vph)	26	177	430	147	1	96	416	7	8	319	12	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.6	3.6		3.6	3.5		3.5	3.0		3.5
Lane Util. Factor		1.00	0.95	0.86		0.86	0.95		0.95	0.88		1.00
Frpb, ped/bikes		1.00	1.00	1.00		1.00	1.00		1.00	1.00		1.00
Flpb, ped/bikes		1.00	1.00	1.00		1.00	1.00		1.00	1.00		1.00
Frt		1.00	1.00	0.97		0.85	1.00		1.00	0.85		0.99
Flt Protected		0.95	1.00	1.00		1.00	0.95		0.95	1.00		0.96
Satd. Flow (prot)		1805	3574	4550		1323	1715		1679	2787		1800
Flt Permitted		0.95	1.00	1.00		1.00	0.95		0.95	1.00		0.96
Satd. Flow (perm)		1805	3574	4550		1323	1715		1679	2787		1800
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	28	192	467	160	1	104	452	8	9	347	13	3
RTOR Reduction (vph)	0	0	0	34	0	46	0	0	0	0	0	0
Lane Group Flow (vph)	0	220	467	171	0	14	235	0	234	347	0	17
Confl. Peds. (#/hr)										2		
Heavy Vehicles (%)	0%	0%	1%	4%	0%	5%	0%	0%	67%	2%	0%	0%
Turn Type	Prot	Prot	NA	NA		Perm	Split	Split	NA	custom	Perm	Prot
Protected Phases	5	5	2	6			8	8	8	1 8		7
Permitted Phases						6					7	
Actuated Green, G (s)		14.8	15.9	13.6		13.6	14.7		14.7	30.7		1.2
Effective Green, g (s)		14.8	15.9	13.6		13.6	14.7		14.7	27.2		1.2
Actuated g/C Ratio		0.26	0.27	0.23		0.23	0.25		0.25	0.47		0.02
Clearance Time (s)		3.0	3.6	3.6		3.6	3.5		3.5			3.5
Vehicle Extension (s)		2.0	2.0	2.0		2.0	2.0		2.0			2.0
Lane Grp Cap (vph)		461	981	1068		310	435		426	1309		37
v/s Ratio Prot		0.12	c0.13	0.04			0.14		c0.14	c0.12		
v/s Ratio Perm						0.01						0.01
v/c Ratio		0.48	0.48	0.16		0.05	0.54		0.55	0.27		0.46
Uniform Delay, d1		18.3	17.5	17.6		17.1	18.7		18.7	9.3		28.0
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	0.0		0.0	0.7		0.8	0.0		3.3
Delay (s)		18.6	17.7	17.6		17.2	19.4		19.5	9.3		31.3
Level of Service		B	B	B		B	B		B	A		C
Approach Delay (s)			17.9	17.5					15.2			31.3
Approach LOS			B	B					B			C

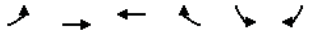
Intersection Summary				
HCM 2000 Control Delay	16.7	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.44			
Actuated Cycle Length (s)	57.9	Sum of lost time (s)	13.6	
Intersection Capacity Utilization	56.8%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
26: US 101 NB Ramps & Rowland Blvd 02/15/2018

Movement	NER
Lane Configurations	
Traffic Volume (vph)	1
Future Volume (vph)	1
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	1
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	0%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM Signalized Intersection Capacity Analysis
27: Rowland Blvd & Rowland Way 02/15/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	401	343	154	22	12	82
Future Volume (vph)	401	343	154	22	12	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.6	3.2		3.2	3.2
Lane Util. Factor	0.97	0.91	0.95		1.00	0.95
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.98		0.89	0.85
Flt Protected	0.95	1.00	1.00		0.99	1.00
Satd. Flow (prot)	3467	5085	3352		1605	1490
Flt Permitted	0.95	1.00	1.00		0.99	1.00
Satd. Flow (perm)	3467	5085	3352		1605	1490
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	451	385	173	25	13	92
RTOR Reduction (vph)	0	0	15	0	34	45
Lane Group Flow (vph)	451	385	183	0	19	7
Confl. Peds. (#/hr)				1	2	
Heavy Vehicles (%)	1%	2%	5%	9%	6%	3%
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases						4
Actuated Green, G (s)	14.8	28.8	10.9		5.9	5.9
Effective Green, g (s)	14.8	28.8	10.9		5.9	5.9
Actuated g/C Ratio	0.36	0.69	0.26		0.14	0.14
Clearance Time (s)	3.5	3.6	3.2		3.2	3.2
Vehicle Extension (s)	2.0	4.0	4.0		2.0	2.0
Lane Grp Cap (vph)	1236	3528	880		228	211
v/s Ratio Prot	c0.13	0.08	c0.05		c0.01	
v/s Ratio Perm						0.00
v/c Ratio	0.36	0.11	0.21		0.08	0.04
Uniform Delay, d1	9.9	2.1	11.9		15.4	15.3
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.1	0.0	0.2		0.1	0.0
Delay (s)	9.9	2.1	12.1		15.5	15.4
Level of Service	A	A	B		B	B
Approach Delay (s)		6.3	12.1		15.4	
Approach LOS		A	B		B	

Intersection Summary				
HCM 2000 Control Delay	8.2	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.26			
Actuated Cycle Length (s)	41.5	Sum of lost time (s)	9.9	
Intersection Capacity Utilization	36.2%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
28: Vintage Way & Rowland Blvd 02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	72	280	2	44	3	115	3	0	1	2	1
Future Volume (vph)	7	72	280	2	44	3	115	3	0	1	2	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.6	3.6	3.0	3.6		3.6	3.6			3.2	
Lane Util. Factor	1.00	0.95	0.88	1.00	0.95		0.97	1.00			1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	1.00			0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1805	3195	2814	1805	3234		3367	1900			1813	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00			0.99	
Satd. Flow (perm)	1805	3195	2814	1805	3234		3367	1900			1813	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	8	85	329	2	52	4	135	4	0	1	2	1
RTOR Reduction (vph)	0	0	0	0	3	0	0	0	0	0	1	0
Lane Group Flow (vph)	8	85	329	2	53	0	135	4	0	0	3	0
Confl. Peds. (#/hr)			1			3			1			
Confl. Bikes (#/hr)			2			2						
Heavy Vehicles (%)	0%	13%	1%	0%	11%	0%	4%	0%	0%	0%	0%	0%
Turn Type	Prot	NA	pt+ov	Prot	NA		Split	NA		Split	NA	
Protected Phases	5	2	2 3	1	6		3	3		4	4	
Permitted Phases												
Actuated Green, G (s)	1.0	9.6	30.0	0.5	9.1		16.8	16.8			1.0	
Effective Green, g (s)	1.0	9.6	30.0	0.5	9.1		16.8	16.8			1.0	
Actuated g/C Ratio	0.02	0.23	0.73	0.01	0.22		0.41	0.41			0.02	
Clearance Time (s)	3.0	3.6		3.0	3.6		3.6	3.6			3.2	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		3.0	3.0			2.0	
Lane Grp Cap (vph)	43	742	2044	21	712		1369	772			43	
v/s Ratio Prot	c0.00	0.03	c0.12	0.00	0.02		0.04	0.00			c0.00	
v/s Ratio Perm												
v/c Ratio	0.19	0.11	0.16	0.10	0.07		0.10	0.01			0.07	
Uniform Delay, d1	19.8	12.5	1.8	20.2	12.8		7.6	7.3			19.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.8	0.0	0.0	0.7	0.0		0.0	0.0			0.3	
Delay (s)	20.5	12.5	1.8	20.9	12.8		7.6	7.3			19.9	
Level of Service	C	B	A	C	B		A	A			B	
Approach Delay (s)		4.3			13.1			7.6			19.9	
Approach LOS		A			B			A			B	

Intersection Summary					
HCM 2000 Control Delay	5.9	HCM 2000 Level of Service	A		
HCM 2000 Volume to Capacity ratio	0.18				
Actuated Cycle Length (s)	41.3	Sum of lost time (s)	13.4		
Intersection Capacity Utilization	35.3%	ICU Level of Service	A		
Analysis Period (min)	15				
c Critical Lane Group					

HCM Signalized Intersection Capacity Analysis
29: Novato Blvd & Sunset Pkwy 02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	198	65	25	37	97	96	24	231	53	51	310	250
Future Volume (vph)	198	65	25	37	97	96	24	231	53	51	310	250
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.0		3.5	3.5		3.5	4.9		3.5	4.6	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	0.97		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	0.96		1.00	0.93		1.00	0.97		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	1808		1805	1713		1805	1839		1770	1727	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1787	1808		1805	1713		1805	1839		1770	1727	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	218	71	27	41	107	105	26	254	58	56	341	275
RTOR Reduction (vph)	0	14	0	0	39	0	0	8	0	0	26	0
Lane Group Flow (vph)	218	84	0	41	173	0	26	304	0	56	590	0
Confl. Peds. (#/hr)			4			21			3			5
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	0%	0%	0%	2%	1%	2%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases												
Actuated Green, G (s)	12.9	23.1		5.6	16.3		3.3	30.1		5.6	32.7	
Effective Green, g (s)	12.9	23.1		5.6	16.3		3.3	30.1		5.6	32.7	
Actuated g/C Ratio	0.16	0.29		0.07	0.20		0.04	0.37		0.07	0.41	
Clearance Time (s)	3.5	4.0		3.5	3.5		3.5	4.9		3.5	4.6	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	287	520		125	347		74	689		123	703	
v/s Ratio Prot	c0.12	0.05		0.02	c0.10		0.01	0.17		c0.03	c0.34	
v/s Ratio Perm												
v/c Ratio	0.76	0.16		0.33	0.50		0.35	0.44		0.46	0.84	
Uniform Delay, d1	32.2	21.4		35.6	28.4		37.5	18.8		35.9	21.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	9.8	0.1		0.6	0.4		1.1	0.2		1.0	8.3	
Delay (s)	42.0	21.4		36.1	28.8		38.5	19.0		36.9	29.7	
Level of Service	D	C		D	C		D	B		D	C	
Approach Delay (s)		35.6			30.0			20.5			30.3	
Approach LOS		D			C			C			C	

Intersection Summary					
HCM 2000 Control Delay	29.2	HCM 2000 Level of Service	C		
HCM 2000 Volume to Capacity ratio	0.73				
Actuated Cycle Length (s)	80.3	Sum of lost time (s)	15.9		
Intersection Capacity Utilization	81.1%	ICU Level of Service	D		
Analysis Period (min)	15				
c Critical Lane Group					

HCM 2010 AWSC
30: Redwood Blvd & Novato Blvd 02/15/2018

Intersection	
Intersection Delay, s/veh	206.7
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	47	463	368	310	170	27	81	6	60	94	21	64
Future Vol, veh/h	47	463	368	310	170	27	81	6	60	94	21	64
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	1	2	1	1	2	1	1	1	1	1	1	1
Mvmt Flow	51	498	396	333	183	29	87	6	65	101	23	69
Number of Lanes	1	1	0	1	1	0	1	1	1	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	3	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	2	2	2
HCM Control Delay	379.6	29.8	15.9	16.5
HCM LOS	F	D	C	C

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	100%	0%	0%	56%	0%	86%	0%	25%
Vol Right, %	0%	0%	100%	0%	44%	0%	14%	0%	75%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	81	6	60	47	831	310	197	94	85
LT Vol	81	0	0	47	0	310	0	94	0
Through Vol	0	6	0	0	463	0	170	0	21
RT Vol	0	0	60	0	368	0	27	0	64
Lane Flow Rate	87	6	65	51	894	333	212	101	91
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.229	0.016	0.148	0.115	1.832	0.757	0.447	0.261	0.21
Departure Headway (Hd)	11.228	10.701	9.963	8.188	7.38	9.616	9.017	11.042	9.956
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	322	337	363	436	491	380	402	327	363
Service Time	8.928	8.401	7.663	5.979	5.17	7.316	6.717	8.742	7.656
HCM Lane V/C Ratio	0.27	0.018	0.179	0.117	1.821	0.876	0.527	0.309	0.251
HCM Control Delay	17.2	13.6	14.4	12.1	400.4	36.8	18.8	17.6	15.3
HCM Lane LOS	C	B	B	B	F	E	C	C	C
HCM 95th-tile Q	0.9	0	0.5	0.4	56	6.1	2.2	1	0.8

HCM Signalized Intersection Capacity Analysis
31: Alameda Del Prado & Ignacio Blvd 02/15/2018

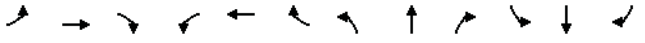
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	838	447	255	318	18	66	4	229	7	2	0
Future Volume (vph)	12	838	447	255	318	18	66	4	229	7	2	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.6	3.6	3.0	3.6			3.5	3.5		3.7	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00			1.00	0.98		1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00			0.99	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	0.99			1.00	0.85		1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00		0.96	
Satd. Flow (prot)	1770	3610	1573	1900	3581			1786	1589		1824	
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.73	1.00		0.85	
Satd. Flow (perm)	1770	3610	1573	1805	3581			1372	1589		1609	
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)	12	873	466	266	331	19	69	4	239	7	2	0
RTOR Reduction (vph)	0	0	89	0	2	0	0	0	207	0	0	0
Lane Group Flow (vph)	13	873	377	266	348	0	0	73	32	0	9	0
Confl. Peds. (#/hr)			4				7		4	4		7
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2				8		8	4		
Actuated Green, G (s)	1.3	49.3	49.3	27.4	75.4			13.2	13.2		13.0	
Effective Green, g (s)	1.3	49.3	49.3	27.4	75.4			13.2	13.2		13.0	
Actuated g/C Ratio	0.01	0.49	0.49	0.27	0.75			0.13	0.13		0.13	
Clearance Time (s)	3.0	3.6	3.6	3.0	3.6			3.5	3.5		3.7	
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0			2.0	2.0		2.0	
Lane Grp Cap (vph)	23	1779	775	520	2700			181	209		209	
v/s Ratio Prot	0.01	c0.24		c0.14	0.10							
v/s Ratio Perm			0.24					c0.05	0.02		0.01	
v/c Ratio	0.57	0.49	0.49	0.51	0.13			0.40	0.15		0.04	
Uniform Delay, d1	49.1	17.0	16.9	30.6	3.4			39.8	38.4		38.1	
Progression Factor	1.00	1.00	1.00	0.63	0.48			1.00	1.00		1.00	
Incremental Delay, d2	17.6	1.0	2.2	0.3	0.1			0.5	0.1		0.0	
Delay (s)	66.6	17.9	19.1	19.6	1.7			40.3	38.6		38.1	
Level of Service	E	B	B	B	A			D	D		D	
Approach Delay (s)		18.8			9.4			39.0			38.1	
Approach LOS		B			A			D			D	

Intersection Summary				
HCM 2000 Control Delay	19.1	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.48			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.3	
Intersection Capacity Utilization	62.8%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
32: US 101 SB Off Ramp/Enfrente Rd & Ignacio Blvd

02/15/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	813	299	168	391	41	0	0	710	248	136	208
Future Volume (vph)	34	813	299	168	391	41	0	0	710	248	136	208
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			2%			0%	
Total Lost time (s)	3.0	8.0	8.0	4.0	5.0				4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95				0.88		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.96	1.00	0.99				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	1.00	0.85	1.00	0.99				0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00				1.00		0.97	1.00
Satd. Flow (prot)	1805	3610	1550	1787	3540				2814		1809	1578
Flt Permitted	0.95	1.00	1.00	0.95	1.00				1.00		0.97	1.00
Satd. Flow (perm)	1805	3610	1550	1787	3540				2814		1809	1578
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)	35	847	311	175	407	43	0	0	740	258	142	217
RTOR Reduction (vph)	0	0	133	0	6	0	0	0	347	0	0	158
Lane Group Flow (vph)	35	847	178	175	444	0	0	0	393	0	400	59
Confl. Peds. (#/hr)			7			20						1
Confl. Bikes (#/hr)						3						
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	5%	1%
Turn Type	Prot	NA	Perm	Prot	NA				Over	Split	NA	Perm
Protected Phases	5	2		1	6				1	7	7	
Permitted Phases			2									7
Actuated Green, G (s)	6.6	29.5	29.5	27.2	54.1				27.2		27.3	27.3
Effective Green, g (s)	6.6	29.5	29.5	27.2	54.1				27.2		27.3	27.3
Actuated g/C Ratio	0.07	0.29	0.29	0.27	0.54				0.27		0.27	0.27
Clearance Time (s)	3.0	8.0	8.0	4.0	5.0				4.0		4.0	4.0
Vehicle Extension (s)	2.0	2.5	2.5	3.0	4.0				3.0		2.5	2.5
Lane Grp Cap (vph)	119	1064	457	486	1915				765		493	430
v/s Ratio Prot	0.02	c0.23		0.10	0.13				c0.14		c0.22	
v/s Ratio Perm			0.11									0.04
v/c Ratio	0.29	0.80	0.39	0.36	0.23				0.51		0.81	0.14
Uniform Delay, d1	44.5	32.5	28.1	29.4	12.0				30.8		33.9	27.5
Progression Factor	0.90	0.66	0.42	1.62	1.95				1.00		1.00	1.00
Incremental Delay, d2	0.5	5.8	2.3	0.4	0.3				0.6		9.6	0.1
Delay (s)	40.4	27.2	14.0	47.9	23.8				31.4		43.5	27.6
Level of Service	D	C	B	D	C				C		D	C
Approach Delay (s)		24.1			30.6			31.4			37.9	
Approach LOS		C			C			C			D	

Intersection Summary				
HCM 2000 Control Delay	29.8	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.71			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	81.7%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
33: Nave Dr & Ignacio Blvd/Bel Marin Keys Blvd

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	715	1053	91	211	165	391	391	583	0	0	0
Future Volume (vph)	0	715	1053	91	211	165	391	391	583	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.6	3.0	4.0		4.6	4.6	3.0			
Lane Util. Factor		0.95	1.00	1.00	0.95		0.91	0.91	1.00			
Frpb, ped/bikes		1.00	0.99	1.00	0.99		1.00	1.00	0.99			
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00			
Frt		1.00	0.85	1.00	0.93		1.00	1.00	0.85			
Flt Protected		1.00	1.00	0.95	1.00		0.95	0.99	1.00			
Satd. Flow (prot)		3610	1605	1805	3323		1643	3389	1599			
Flt Permitted		1.00	1.00	0.95	1.00		0.95	0.99	1.00			
Satd. Flow (perm)		3610	1605	1805	3323		1643	3389	1599			
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)	0	761	1120	97	224	176	416	416	620	0	0	0
RTOR Reduction (vph)	0	0	90	0	89	0	0	0	13	0	0	0
Lane Group Flow (vph)	0	761	1030	97	311	0	270	562	607	0	0	0
Confl. Peds. (#/hr)			1			1			1			
Heavy Vehicles (%)	0%	0%	0%	0%	0%	2%	0%	1%	0%	0%	0%	0%
Turn Type		NA	pm+ov	Prot	NA		Split	NA	pm+ov			
Protected Phases		2	3	1	6		3	3	1			
Permitted Phases			2						3			
Actuated Green, G (s)		34.5	76.4	12.0	49.5		41.9	41.9	53.9			
Effective Green, g (s)		34.5	76.4	12.0	49.5		41.9	41.9	53.9			
Actuated g/C Ratio		0.34	0.76	0.12	0.50		0.42	0.42	0.54			
Clearance Time (s)		4.0	4.6	3.0	4.0		4.6	4.6	3.0			
Vehicle Extension (s)		4.0	2.0	2.0	4.0		2.0	2.0	2.0			
Lane Grp Cap (vph)		1245	1226	216	1644		688	1419	861			
v/s Ratio Prot		0.21	c0.35	0.05	0.09		0.16	0.17	c0.08			
v/s Ratio Perm			0.29						0.29			
v/c Ratio		0.61	0.84	0.45	0.19		0.39	0.40	0.70			
Uniform Delay, d1		27.2	7.8	40.9	14.1		20.2	20.2	17.1			
Progression Factor		0.76	1.96	1.19	0.89		1.00	1.00	1.00			
Incremental Delay, d2		1.6	3.6	0.5	0.3		0.1	0.1	2.2			
Delay (s)		22.3	18.8	49.2	12.8		20.3	20.3	19.3			
Level of Service		C	B	D	B		C	C	B			
Approach Delay (s)		20.2			19.9			19.9			0.0	
Approach LOS		C			B			B			A	

Intersection Summary				
HCM 2000 Control Delay	20.1	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.82			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.6	
Intersection Capacity Utilization	82.5%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
34: Bel Marin Keys Blvd & Commercial Blvd

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	11	73	0	9	46	1029	230	12	376	1
Future Volume (vph)	0	0	11	73	0	9	46	1029	230	12	376	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	3.0	3.9		3.0	3.5	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.86			1.00	0.85	1.00	0.97		1.00	1.00	
Flt Protected		1.00			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1620			1801	1395	1805	3494		1805	3573	
Flt Permitted		1.00			0.75	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1620			1421	1395	1805	3494		1805	3573	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	12	77	0	9	48	1083	242	13	396	1
RTOR Reduction (vph)	0	11	0	0	0	8	0	10	0	0	0	0
Lane Group Flow (vph)	0	1	0	0	77	1	48	1315	0	13	397	0
Confl. Peds. (#/hr)	3		2	2		3			3			
Heavy Vehicles (%)	2%	0%	0%	0%	0%	14%	0%	0%	0%	0%	1%	0%
Turn Type		NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		12.1			12.1	12.1	5.3	75.2		1.8	72.1	
Effective Green, g (s)		12.1			12.1	12.1	5.3	75.2		1.8	72.1	
Actuated g/C Ratio		0.12			0.12	0.12	0.05	0.75		0.02	0.72	
Clearance Time (s)		4.0			4.0	4.0	3.0	3.9		3.0	3.5	
Vehicle Extension (s)		3.0			3.0	3.0	2.5	3.0		2.5	4.0	
Lane Grp Cap (vph)		196			171	168	95	2627		32	2576	
v/s Ratio Prot		0.00					c0.03	c0.38		0.01	0.11	
v/s Ratio Perm					c0.05	0.00						
v/c Ratio		0.01			0.45	0.01	0.51	0.50		0.41	0.15	
Uniform Delay, d1		38.7			40.9	38.7	46.1	4.9		48.6	4.4	
Progression Factor		1.00			1.00	1.00	0.90	0.59		0.94	1.33	
Incremental Delay, d2		0.0			1.9	0.0	2.3	0.5		6.0	0.1	
Delay (s)		38.7			42.7	38.7	43.8	3.4		51.5	5.9	
Level of Service		D			D	D	D	A		D	A	
Approach Delay (s)		38.7			42.3			4.8			7.4	
Approach LOS		D			D			A			A	

Intersection Summary				
HCM 2000 Control Delay	7.3	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.51			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.9	
Intersection Capacity Utilization	58.7%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
35: Bel Marin Keys Blvd & Hamilton Dr/Digital Dr

02/15/2018

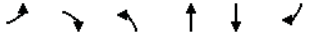
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1	46	75	2	9	104	464	468	9	268	3
Future Volume (vph)	0	1	46	75	2	9	104	464	468	9	268	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	3.5	3.5	3.5		3.0	4.0		3.0	4.0	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.99	1.00	0.99		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	0.85	1.00	0.88		1.00	0.92		1.00	1.00	
Flt Protected		1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1900	1533	1803	1649		1770	3298		1805	3567	
Flt Permitted		1.00	1.00	0.76	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1900	1533	1437	1649		1770	3298		1805	3567	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1	48	79	2	9	109	488	493	9	282	3
RTOR Reduction (vph)	0	0	42	0	8	0	0	86	0	0	0	0
Lane Group Flow (vph)	0	1	6	79	3	0	109	895	0	9	285	0
Confl. Peds. (#/hr)	1		1	1		1			2			8
Heavy Vehicles (%)	0%	0%	4%	0%	0%	0%	2%	0%	0%	0%	1%	0%
Turn Type		NA	Perm	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8								
Actuated Green, G (s)		12.1	12.1	12.1	12.1		11.2	75.6		1.8	66.2	
Effective Green, g (s)		12.1	12.1	12.1	12.1		11.2	75.6		1.8	66.2	
Actuated g/C Ratio		0.12	0.12	0.12	0.12		0.11	0.76		0.02	0.66	
Clearance Time (s)		3.5	3.5	3.5	3.5		3.0	4.0		3.0	4.0	
Vehicle Extension (s)		2.0	2.0	2.5	2.5		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)		229	185	173	199		198	2493		32	2361	
v/s Ratio Prot		0.00			0.00		c0.06	c0.27		0.00	0.08	
v/s Ratio Perm			0.00	c0.05								
v/c Ratio		0.00	0.03	0.46	0.02		0.55	0.36		0.28	0.12	
Uniform Delay, d1		38.7	38.8	40.9	38.7		42.0	4.1		48.5	6.2	
Progression Factor		1.00	1.00	1.00	1.00		1.09	1.35		1.00	1.00	
Incremental Delay, d2		0.0	0.0	1.4	0.0		1.7	0.4		1.8	0.1	
Delay (s)		38.7	38.8	42.3	38.7		47.5	5.9		50.2	6.3	
Level of Service		D	D	D	D		D	A		D	A	
Approach Delay (s)		38.8			41.8			10.1			7.7	
Approach LOS		D			D			B			A	

Intersection Summary				
HCM 2000 Control Delay	12.4	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.41			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.5	
Intersection Capacity Utilization	56.6%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
36: Nave Dr & US 101 NB Off Ramp

02/15/2018



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	672	139	0	693	945	185
Future Volume (vph)	672	139	0	693	945	185
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		5.0	5.0	
Lane Util. Factor	0.97	1.00		0.95	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	0.98	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3467	1563		3574	3492	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3467	1563		3574	3492	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	730	151	0	753	1027	201
RTOR Reduction (vph)	0	43	0	0	23	0
Lane Group Flow (vph)	730	108	0	753	1205	0
Confl. Peds. (#/hr)		1				
Heavy Vehicles (%)	1%	2%	0%	1%	1%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	27.0	27.0		35.0	35.0	
Effective Green, g (s)	27.0	27.0		35.0	35.0	
Actuated g/C Ratio	0.39	0.39		0.50	0.50	
Clearance Time (s)	3.0	3.0		5.0	5.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	1337	602		1787	1746	
v/s Ratio Prot	c0.21			0.21	c0.35	
v/s Ratio Perm		0.07				
v/c Ratio	0.55	0.18		0.42	0.69	
Uniform Delay, d1	16.7	14.2		11.1	13.4	
Progression Factor	1.00	1.00		0.43	1.00	
Incremental Delay, d2	1.6	0.7		0.7	2.3	
Delay (s)	18.3	14.8		5.4	15.6	
Level of Service	B	B		A	B	
Approach Delay (s)	17.7			5.4	15.6	
Approach LOS	B			A	B	

Intersection Summary				
HCM 2000 Control Delay	13.6	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.63			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	62.0%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
37: Nave Dr & Hamilton Center

02/15/2018

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	38	20	530	82	97	835
Future Volume (vph)	38	20	530	82	97	835
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.2	3.2	4.4		3.0	4.4
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.98		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	1615	1860		1770	1881
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1805	1615	1860		1770	1881
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	42	22	582	90	107	918
RTOR Reduction (vph)	0	21	7	0	0	0
Lane Group Flow (vph)	42	1	665	0	107	918
Confl. Peds. (#/hr)				2		
Heavy Vehicles (%)	0%	0%	0%	0%	2%	1%
Turn Type	Prot	Perm	NA		Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8				
Actuated Green, G (s)	3.6	3.6	48.6		7.2	58.8
Effective Green, g (s)	3.6	3.6	48.6		7.2	58.8
Actuated g/C Ratio	0.05	0.05	0.69		0.10	0.84
Clearance Time (s)	3.2	3.2	4.4		3.0	4.4
Vehicle Extension (s)	1.0	1.0	1.0		1.0	1.0
Lane Grp Cap (vph)	92	83	1291		182	1580
v/s Ratio Prot	c0.02		0.36		0.06	c0.49
v/s Ratio Perm		0.00				
v/c Ratio	0.46	0.01	0.52		0.59	0.58
Uniform Delay, d1	32.2	31.5	5.1		30.0	1.8
Progression Factor	1.00	1.00	0.53		1.25	1.37
Incremental Delay, d2	1.3	0.0	1.4		2.4	1.2
Delay (s)	33.6	31.5	4.1		39.8	3.6
Level of Service	C	C	A		D	A
Approach Delay (s)	32.9		4.1			7.4
Approach LOS	C		A			A

Intersection Summary				
HCM 2000 Control Delay	7.0	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.60			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	10.6	
Intersection Capacity Utilization	55.9%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
38: Nave Dr & Hamilton Pkwy

02/15/2018

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	113	225	357	29	272	567
Future Volume (vph)	113	225	357	29	272	567
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.2	3.2	4.4	4.4	3.0	4.4
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1599	1900	1578	1787	1850
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1599	1900	1578	1787	1900
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	124	247	392	32	299	623
RTOR Reduction (vph)	0	214	0	11	0	0
Lane Group Flow (vph)	124	33	392	21	299	623
Confl. Peds. (#/hr)				2		
Heavy Vehicles (%)	2%	1%	0%	0%	1%	0%
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Actuated Green, G (s)	9.4	9.4	30.7	30.7	19.3	53.0
Effective Green, g (s)	9.4	9.4	30.7	30.7	19.3	53.0
Actuated g/C Ratio	0.13	0.13	0.44	0.44	0.28	0.76
Clearance Time (s)	3.2	3.2	4.4	4.4	3.0	4.4
Vehicle Extension (s)	2.0	2.0	3.0	3.0	2.0	3.0
Lane Grp Cap (vph)	237	214	833	692	492	1400
v/s Ratio Prot	c0.07		0.21		c0.17	c0.34
v/s Ratio Perm		0.02		0.01		
v/c Ratio	0.52	0.15	0.47	0.03	0.61	0.45
Uniform Delay, d1	28.2	26.8	13.9	11.2	22.1	3.1
Progression Factor	1.00	1.00	1.00	1.00	1.39	0.32
Incremental Delay, d2	1.0	0.1	1.9	0.1	1.2	0.9
Delay (s)	29.2	26.9	15.8	11.3	31.9	1.9
Level of Service	C	C	B	B	C	A
Approach Delay (s)	27.7		15.5			11.6
Approach LOS	C		B			B

Intersection Summary				
HCM 2000 Control Delay	16.0	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.53			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	10.6	
Intersection Capacity Utilization	52.5%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
39: Nave Dr & Main Gate Dr

02/15/2018

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	209	70	193	349	119	307
Future Volume (vph)	209	70	193	349	119	307
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	4.1	4.1	3.0	4.4
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1805	1615	1900	1615	1805	1881
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1805	1615	1900	1615	1805	1881
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	225	75	208	375	128	330
RTOR Reduction (vph)	0	61	0	251	0	0
Lane Group Flow (vph)	225	14	208	124	128	330
Heavy Vehicles (%)	0%	0%	0%	0%	0%	1%
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Actuated Green, G (s)	7.3	7.3	12.7	12.7	8.3	23.7
Effective Green, g (s)	7.3	7.3	12.7	12.7	8.3	23.7
Actuated g/C Ratio	0.19	0.19	0.33	0.33	0.22	0.62
Clearance Time (s)	3.0	3.0	4.1	4.1	3.0	4.4
Vehicle Extension (s)	2.0	2.0	1.0	1.0	1.0	1.0
Lane Grp Cap (vph)	343	307	628	534	390	1160
v/s Ratio Prot	c0.12		c0.11		c0.07	0.18
v/s Ratio Perm		0.01		0.08		
v/c Ratio	0.66	0.05	0.33	0.23	0.33	0.28
Uniform Delay, d1	14.4	12.7	9.7	9.3	12.7	3.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.4	0.0	0.1	0.1	0.2	0.0
Delay (s)	17.8	12.7	9.8	9.4	12.9	3.5
Level of Service	B	B	A	A	B	A
Approach Delay (s)	16.5		9.5			6.1
Approach LOS	B		A			A

Intersection Summary				
HCM 2000 Control Delay	9.9	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.41			
Actuated Cycle Length (s)	38.4	Sum of lost time (s)	10.1	
Intersection Capacity Utilization	41.8%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
40: Nave Dr & Bolling Dr 02/15/2018

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	322	88	396	72	61	469
Future Volume (vph)	322	88	396	72	61	469
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	4.1		3.0	3.5
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	0.97	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.98		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1787	1573	1845		1805	1881
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1787	1573	1845		1805	1881
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	354	97	435	79	67	515
RTOR Reduction (vph)	0	66	9	0	0	0
Lane Group Flow (vph)	354	31	505	0	67	515
Confl. Peds. (#/hr)		6				
Heavy Vehicles (%)	1%	0%	1%	0%	0%	1%
Turn Type	Prot	Perm	NA		Prot	NA
Protected Phases	4		6		5	2
Permitted Phases		4				
Actuated Green, G (s)	15.8	15.8	18.8		4.2	26.6
Effective Green, g (s)	15.8	15.8	18.8		4.2	26.6
Actuated g/C Ratio	0.32	0.32	0.38		0.09	0.54
Clearance Time (s)	3.0	3.0	4.1		3.0	3.5
Vehicle Extension (s)	2.0	2.0	2.0		2.0	2.0
Lane Grp Cap (vph)	577	508	709		155	1023
v/s Ratio Prot	c0.20		c0.27		0.04	c0.27
v/s Ratio Perm		0.02				
v/c Ratio	0.61	0.06	0.71		0.43	0.50
Uniform Delay, d1	14.0	11.4	12.8		21.2	7.0
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	1.4	0.0	2.8		0.7	0.1
Delay (s)	15.3	11.4	15.6		21.9	7.1
Level of Service	B	B	B		C	A
Approach Delay (s)	14.5		15.6			8.8
Approach LOS	B		B			A

Intersection Summary			
HCM 2000 Control Delay	12.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	48.9	Sum of lost time (s)	10.1
Intersection Capacity Utilization	61.0%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 AWSC
41: Alameda Del Prado & Clay Ct/Nave Dr 02/15/2018

Intersection	
Intersection Delay, s/veh	21.2
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	125	11	0	63	117	584	2	156	43	32	20	6
Future Vol, veh/h	125	11	0	63	117	584	2	156	43	32	20	6
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	132	12	0	66	123	615	2	164	45	34	21	6
Number of Lanes	0	1	0	0	1	1	0	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	2	1
HCM Control Delay	12.1	25.5	14	10.8
HCM LOS	B	D	B	B

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	1%	92%	35%	0%	100%	0%
Vol Thru, %	78%	8%	65%	0%	0%	77%
Vol Right, %	21%	0%	0%	100%	0%	23%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	201	136	180	584	32	26
LT Vol	2	125	63	0	32	0
Through Vol	156	11	117	0	0	20
RT Vol	43	0	0	584	0	6
Lane Flow Rate	212	143	189	615	34	27
Geometry Grp	6	6	7	7	7	7
Degree of Util (X)	0.392	0.264	0.31	0.855	0.073	0.054
Departure Headway (Hd)	6.678	6.646	5.893	5.009	7.785	7.108
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	540	540	610	725	459	503
Service Time	4.723	4.698	3.63	2.745	5.545	4.868
HCM Lane V/C Ratio	0.393	0.265	0.31	0.848	0.074	0.054
HCM Control Delay	14	12.1	11.3	29.9	11.2	10.3
HCM Lane LOS	B	B	B	D	B	B
HCM 95th-tile Q	1.9	1.1	1.3	10	0.2	0.2

HCM 2010 AWSC
1: Simmons Ln & San Marin Dr 02/15/2018

Intersection	
Intersection Delay, s/veh	74.6
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	11	403	81	294	874	27	93	14	143	16	11	12
Future Vol, veh/h	11	403	81	294	874	27	93	14	143	16	11	12
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	433	87	316	940	29	100	15	154	17	12	13
Number of Lanes	1	2	0	1	2	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	3	3
HCM Control Delay	26.4	108.2	18.3	15.4
HCM LOS	D	F	C	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1
Vol Left, %	87%	0%	100%	0%	0%	100%	0%	0%	41%
Vol Thru, %	13%	0%	0%	100%	62%	0%	100%	92%	28%
Vol Right, %	0%	100%	0%	0%	38%	0%	0%	8%	31%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	107	143	11	269	215	294	583	318	39
LT Vol	93	0	11	0	0	294	0	0	16
Through Vol	14	0	0	269	134	0	583	291	11
RT Vol	0	143	0	0	81	0	0	27	12
Lane Flow Rate	115	154	12	289	232	316	627	342	42
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.324	0.385	0.03	0.698	0.543	0.723	1.344	0.729	0.124
Departure Headway (Hd)	10.748	9.593	9.723	9.209	8.938	8.237	7.724	7.663	11.144
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	337	378	370	396	405	439	470	469	324
Service Time	8.448	7.293	7.423	6.909	6.638	6.008	5.495	5.434	8.844
HCM Lane V/C Ratio	0.341	0.407	0.032	0.73	0.573	0.72	1.334	0.729	0.13
HCM Control Delay	18.5	18.2	12.7	30.6	21.8	29.8	191.4	28.5	15.4
HCM Lane LOS	C	C	B	D	C	D	F	D	C
HCM 95th-tile Q	1.4	1.8	0.1	5.1	3.1	5.7	28.1	5.9	0.4

HCM Signalized Intersection Capacity Analysis
2: W Campus Dr & San Marin Dr 02/15/2018

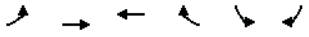
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	581	0	3	1198	1	0	0	0	53	0	5
Future Volume (vph)	0	581	0	3	1198	1	0	0	0	53	0	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.8		4.0	4.8	4.8				4.0	4.0	4.0
Lane Util. Factor		0.95		1.00	0.95	1.00				0.95	0.95	1.00
Frpb, ped/bikes		1.00		1.00	1.00	1.00				1.00	1.00	1.00
Flpb, ped/bikes		1.00		1.00	1.00	1.00				1.00	1.00	1.00
Frt		1.00		1.00	1.00	0.85				1.00	1.00	0.85
Flt Protected		1.00		0.95	1.00	1.00				0.95	0.95	1.00
Satd. Flow (prot)		3574		1805	3574	1615				1715	1715	1615
Flt Permitted		1.00		0.95	1.00	1.00				0.87	0.87	1.00
Satd. Flow (perm)		3574		1805	3574	1615				1570	1570	1615
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)	0	618	0	3	1274	1	0	0	0	56	0	5
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	4
Lane Group Flow (vph)	0	618	0	3	1274	1	0	0	0	28	28	1
Confl. Peds. (#/hr)			2									
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA	Perm				Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8			4		4
Actuated Green, G (s)		21.8		1.2	27.0	27.0				4.6	4.6	4.6
Effective Green, g (s)		21.8		1.2	27.0	27.0				4.6	4.6	4.6
Actuated g/C Ratio		0.54		0.03	0.67	0.67				0.11	0.11	0.11
Clearance Time (s)		4.8		4.0	4.8	4.8				4.0	4.0	4.0
Vehicle Extension (s)		4.0		2.0	4.0	4.0				2.0	2.0	2.0
Lane Grp Cap (vph)		1928		53	2388	1079				178	178	183
v/s Ratio Prot		0.17		0.00	c0.36							
v/s Ratio Perm						0.00				c0.02	0.02	0.00
v/c Ratio		0.32		0.06	0.53	0.00				0.16	0.16	0.00
Uniform Delay, d1		5.2		19.0	3.5	2.2				16.2	16.2	15.9
Progression Factor		1.00		1.00	1.00	1.00				1.00	1.00	1.00
Incremental Delay, d2		0.1		0.2	0.3	0.0				0.2	0.2	0.0
Delay (s)		5.3		19.2	3.7	2.2				16.3	16.3	15.9
Level of Service		A		B	A	A				B	B	B
Approach Delay (s)		5.3			3.8			0.0			16.3	
Approach LOS		A			A			A			B	

Intersection Summary			
HCM 2000 Control Delay	4.7	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	40.4	Sum of lost time (s)	12.8
Intersection Capacity Utilization	48.8%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: San Marin Dr & E Campus Drive

02/15/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	641	1208	6	5	2
Future Volume (vph)	0	641	1208	6	5	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.3	4.3	4.3	3.0	3.0
Lane Util. Factor		0.95	0.95	1.00	0.97	1.00
Frpb, ped/bikes		1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00
Frt		1.00	1.00	0.85	1.00	0.85
Flt Protected		1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)		3574	3574	1615	3502	1595
Flt Permitted		1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)		3574	3574	1615	3502	1595
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	668	1258	6	5	2
RTOR Reduction (vph)	0	0	0	2	0	2
Lane Group Flow (vph)	0	668	1258	4	5	0
Confl. Peds. (#/hr)						1
Heavy Vehicles (%)	0%	1%	1%	0%	0%	0%
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Actuated Green, G (s)		24.7	24.7	24.7	2.5	2.5
Effective Green, g (s)		24.7	24.7	24.7	2.5	2.5
Actuated g/C Ratio		0.72	0.72	0.72	0.07	0.07
Clearance Time (s)		4.3	4.3	4.3	3.0	3.0
Vehicle Extension (s)		4.0	4.0	4.0	2.0	2.0
Lane Grp Cap (vph)		2558	2558	1156	253	115
v/s Ratio Prot		0.19	c0.35		c0.00	
v/s Ratio Perm				0.00		0.00
v/c Ratio		0.26	0.49	0.00	0.02	0.00
Uniform Delay, d1		1.7	2.1	1.4	14.9	14.8
Progression Factor		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.1	0.2	0.0	0.0	0.0
Delay (s)		1.8	2.4	1.4	14.9	14.8
Level of Service		A	A	A	B	B
Approach Delay (s)		1.8	2.3		14.9	
Approach LOS		A	A		B	

Intersection Summary				
HCM 2000 Control Delay	2.2	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.50			
Actuated Cycle Length (s)	34.5	Sum of lost time (s)	10.3	
Intersection Capacity Utilization	46.0%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
4: Redwood Blvd & San Marin Dr

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	515	140	234	858	50	254	52	378	218	66	61
Future Volume (vph)	13	515	140	234	858	50	254	52	378	218	66	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.6		3.0	4.0		4.3	4.3	4.3	4.3	4.3	
Lane Util. Factor	1.00	0.91		1.00	0.91		0.97	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	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	1.00	
Frt	1.00	0.97		1.00	0.99		1.00	1.00	0.85	1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1787	4955		1752	5093		3467	1881	1568	1787	1731	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1787	4955		1752	5093		3467	1881	1568	1787	1731	
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)	14	548	149	249	913	53	270	55	402	232	70	65
RTOR Reduction (vph)	0	37	0	0	3	0	0	0	354	0	31	0
Lane Group Flow (vph)	14	660	0	249	963	0	270	55	48	232	104	0
Confl. Peds. (#/hr)			4									5
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	1%	1%	1%	3%	1%	1%	1%	1%	3%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA		Split	NA	Perm	Split	NA	
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases					2				7			
Actuated Green, G (s)	4.0	45.8		33.1	74.5		11.6	11.6	11.6	24.3	24.3	
Effective Green, g (s)	4.0	45.8		33.1	74.5		11.6	11.6	11.6	24.3	24.3	
Actuated g/C Ratio	0.03	0.35		0.25	0.57		0.09	0.09	0.09	0.19	0.19	
Clearance Time (s)	3.0	3.6		3.0	4.0		4.3	4.3	4.3	4.3	4.3	
Vehicle Extension (s)	2.0	4.0		5.0	4.0		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	54	1745		446	2918		309	167	139	334	323	
v/s Ratio Prot	0.01	c0.13		c0.14	0.19		c0.08	0.03		c0.13	0.06	
v/s Ratio Perm									0.03			
v/c Ratio	0.26	0.38		0.56	0.33		0.87	0.33	0.34	0.69	0.32	
Uniform Delay, d1	61.6	31.5		42.1	14.6		58.5	55.6	55.6	49.4	45.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.9	0.2		5.0	0.3		22.2	0.4	0.5	5.0	0.2	
Delay (s)	62.5	31.6		47.1	14.9		80.7	56.0	56.2	54.4	45.9	
Level of Service	E	C		D	B		F	E	E	D	D	
Approach Delay (s)		32.3			21.5			65.3			51.3	
Approach LOS		C			C			E			D	

Intersection Summary				
HCM 2000 Control Delay	38.2	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.55			
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	15.6	
Intersection Capacity Utilization	63.8%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
5: US 101 SB Ramps & San Marin Dr

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	526	549	148	935	0	0	0	0	53	2	260
Future Volume (vph)	0	526	549	148	935	0	0	0	0	53	2	260
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9	4.9	3.0	5.3						4.0	4.0
Lane Util. Factor		0.95	1.00	1.00	0.95						1.00	0.88
Frpb, ped/bikes		1.00	0.98	1.00	1.00						1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		3574	1575	1805	3574						1813	2814
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		3574	1575	1805	3574						1813	2814
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	542	566	153	964	0	0	0	0	55	2	268
RTOR Reduction (vph)	0	0	234	0	0	0	0	0	0	0	0	241
Lane Group Flow (vph)	0	542	332	153	964	0	0	0	0	0	57	27
Confl. Peds. (#/hr)			4									
Heavy Vehicles (%)	0%	1%	1%	0%	1%	0%	0%	0%	0%	0%	0%	1%
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			2									4
Actuated Green, G (s)		41.1	41.1	10.0	53.7						7.0	7.0
Effective Green, g (s)		41.1	41.1	10.0	53.7						7.0	7.0
Actuated g/C Ratio		0.59	0.59	0.14	0.77						0.10	0.10
Clearance Time (s)		4.9	4.9	3.0	5.3						4.0	4.0
Vehicle Extension (s)		4.0	4.0	2.0	4.0						2.0	2.0
Lane Grp Cap (vph)		2098	924	257	2741						181	281
v/s Ratio Prot		0.15		c0.08	c0.27						c0.03	
v/s Ratio Perm			0.21									0.01
v/c Ratio		0.26	0.36	0.60	0.35						0.31	0.10
Uniform Delay, d1		7.0	7.6	28.1	2.6						29.3	28.6
Progression Factor		1.00	1.00	1.00	1.00						1.00	1.00
Incremental Delay, d2		0.3	1.1	2.5	0.4						0.4	0.1
Delay (s)		7.3	8.7	30.6	3.0						29.6	28.7
Level of Service		A	A	C	A						C	C
Approach Delay (s)		8.0			6.7			0.0			28.8	
Approach LOS		A			A			A			C	

Intersection Summary				
HCM 2000 Control Delay	10.1	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.40			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	11.9	
Intersection Capacity Utilization	86.8%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
6: US 101 NB Ramps & San Marin Dr

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	270	259	0	0	319	51	863	108	173	0	0	0
Future Volume (vph)	270	259	0	0	319	51	863	108	173	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.6			4.9	4.9	3.5	3.5				
Lane Util. Factor	0.97	1.00			0.95	1.00	0.95	0.95				
Frpb, ped/bikes	1.00	1.00			1.00	0.99	1.00	0.99				
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00				
Frt	1.00	1.00			1.00	0.85	1.00	0.95				
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.98				
Satd. Flow (prot)	3467	1881			3574	1593	1681	1638				
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.98				
Satd. Flow (perm)	3467	1881			3574	1593	1681	1638				
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)	281	270	0	0	332	53	899	112	180	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	43	0	26	0	0	0	0
Lane Group Flow (vph)	281	270	0	0	332	10	602	564	0	0	0	0
Confl. Peds. (#/hr)			3			1			1	1		
Heavy Vehicles (%)	1%	1%	0%	0%	1%	0%	2%	0%	3%	0%	0%	0%
Turn Type	Prot	NA			NA	Perm	Split	NA				
Protected Phases	5	2			6		8	8				
Permitted Phases						6						
Actuated Green, G (s)	9.2	24.4			11.4	11.4	25.2	25.2				
Effective Green, g (s)	9.2	24.4			11.4	11.4	25.2	25.2				
Actuated g/C Ratio	0.16	0.42			0.20	0.20	0.44	0.44				
Clearance Time (s)	3.5	4.6			4.9	4.9	3.5	3.5				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	2.5	2.5				
Lane Grp Cap (vph)	552	795			706	314	734	715				
v/s Ratio Prot	c0.08	0.14			c0.09		c0.36	0.34				
v/s Ratio Perm						0.01						
v/c Ratio	0.51	0.34			0.47	0.03	0.82	0.79				
Uniform Delay, d1	22.2	11.2			20.5	18.7	14.3	14.0				
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00				
Incremental Delay, d2	0.3	0.3			0.7	0.1	7.2	5.6				
Delay (s)	22.5	11.6			21.2	18.8	21.4	19.5				
Level of Service	C	B			C	B	C	B				
Approach Delay (s)		17.1			20.8			20.5			0.0	
Approach LOS		B			C			C			A	

Intersection Summary				
HCM 2000 Control Delay	19.7	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.67			
Actuated Cycle Length (s)	57.7	Sum of lost time (s)	11.9	
Intersection Capacity Utilization	86.8%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
7: Redwood Blvd & Olive St

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	117	68	28	123	101	83	68	671	143	88	308	106
Future Volume (vph)	117	68	28	123	101	83	68	671	143	88	308	106
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.1	5.1			5.1		4.0	3.9	3.9	4.0	3.9	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.96			0.96		1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00			0.98		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1781			1760		1770	3539	1583	1770	3403	
Flt Permitted	0.95	1.00			0.98		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1781			1760		1770	3539	1583	1770	3403	
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)	124	72	30	131	107	88	72	714	152	94	328	113
RTOR Reduction (vph)	0	15	0	0	12	0	0	0	81	0	31	0
Lane Group Flow (vph)	124	87	0	0	314	0	72	714	71	94	410	0
Turn Type	Split	NA		Split	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	12.2	12.2			17.9		7.4	20.3	20.3	7.4	20.3	
Effective Green, g (s)	12.2	12.2			17.9		7.4	20.3	20.3	7.4	20.3	
Actuated g/C Ratio	0.16	0.16			0.24		0.10	0.27	0.27	0.10	0.27	
Clearance Time (s)	5.1	5.1			5.1		4.0	3.9	3.9	4.0	3.9	
Vehicle Extension (s)	1.0	1.0			1.0		1.0	1.0	1.0	1.0	1.0	
Lane Grp Cap (vph)	284	286			415		172	946	423	172	910	
v/s Ratio Prot	c0.07	0.05			c0.18		0.04	c0.20		c0.05	0.12	
v/s Ratio Perm									0.04			
v/c Ratio	0.44	0.30			0.76		0.42	0.75	0.17	0.55	0.45	
Uniform Delay, d1	28.7	28.1			27.0		32.2	25.5	21.3	32.7	23.2	
Progression Factor	1.00	1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.4	0.2			6.8		0.6	3.1	0.1	1.9	0.1	
Delay (s)	29.1	28.3			33.8		32.8	28.6	21.4	34.5	23.3	
Level of Service	C	C			C		C	C	C	C	C	
Approach Delay (s)		28.8			33.8			27.7			25.3	
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	0.66			
Actuated Cycle Length (s)	75.9	Sum of lost time (s)	18.1	
Intersection Capacity Utilization	61.6%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
8: Redwood Blvd & Grant Ave

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	72	125	172	27	158	56	251	497	54	39	364	90
Future Volume (vph)	72	125	172	27	158	56	251	497	54	39	364	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5		3.5	3.7	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.97	1.00	0.99		1.00	0.99	
Flpb, ped/bikes	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1755	1900	1537	1803	1900	1563	1805	3467		1805	3419	
Flt Permitted	0.63	1.00	1.00	0.67	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1160	1900	1537	1277	1900	1563	1805	3467		1805	3419	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	76	132	181	28	166	59	264	523	57	41	383	95
RTOR Reduction (vph)	0	0	131	0	0	43	0	7	0	0	21	0
Lane Group Flow (vph)	76	132	50	28	166	16	264	573	0	41	457	0
Confl. Peds. (#/hr)	22		46	2		34			36			10
Confl. Bikes (#/hr)			5			5			5			5
Heavy Vehicles (%)	2%	0%	1%	0%	0%	0%	0%	2%	0%	0%	2%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8		8	4		4						
Actuated Green, G (s)	17.2	17.2	17.2	17.2	17.2	17.2	16.0	29.1		5.5	18.4	
Effective Green, g (s)	17.2	17.2	17.2	17.2	17.2	17.2	16.0	29.1		5.5	18.4	
Actuated g/C Ratio	0.27	0.27	0.27	0.27	0.27	0.27	0.25	0.46		0.09	0.29	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5		3.5	3.7	
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0	4.0	2.5	3.0		2.5	3.0	
Lane Grp Cap (vph)	317	520	420	349	520	428	459	1606		158	1001	
v/s Ratio Prot		0.07			c0.09		c0.15	0.17		0.02	c0.13	
v/s Ratio Perm	0.07		0.03	0.02		0.01						
v/c Ratio	0.24	0.25	0.12	0.08	0.32	0.04	0.58	0.36		0.26	0.46	
Uniform Delay, d1	17.7	17.8	17.1	16.9	18.1	16.7	20.4	10.8		26.7	18.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.4	0.2	0.1	0.5	0.0	1.4	0.1		0.6	0.3	
Delay (s)	18.3	18.1	17.3	17.1	18.6	16.8	21.9	11.0		27.4	18.5	
Level of Service	B	B	B	B	B	B	C	B		C	B	
Approach Delay (s)		17.8			18.0			14.4			19.2	
Approach LOS		B			B			B			B	

Intersection Summary				
HCM 2000 Control Delay	16.7	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.45			
Actuated Cycle Length (s)	62.8	Sum of lost time (s)	11.2	
Intersection Capacity Utilization	78.5%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

HCM 2010 AWSC
9: San Marin Dr/Sutro Ave & Novato Blvd #1 02/15/2018

Intersection	
Intersection Delay, s/veh	59.9
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	77	135	53	73	277	147	66	126	58	137	224	396
Future Vol, veh/h	77	135	53	73	277	147	66	126	58	137	224	396
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	81	142	56	77	292	155	69	133	61	144	236	417
Number of Lanes	1	1	0	1	1	0	1	1	0	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	3	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	3	2	2
HCM Control Delay	23.8	119	23.7	45.6
HCM LOS	C	F	C	E

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%	0%
Vol Thru, %	0%	68%	0%	72%	0%	65%	0%	100%	0%
Vol Right, %	0%	32%	0%	28%	0%	35%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	66	184	77	188	73	424	137	224	396
LT Vol	66	0	77	0	73	0	137	0	0
Through Vol	0	126	0	135	0	277	0	224	0
RT Vol	0	58	0	53	0	147	0	0	396
Lane Flow Rate	69	194	81	198	77	446	144	236	417
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.211	0.549	0.245	0.559	0.22	1.185	0.382	0.591	0.964
Departure Headway (Hd)	11.609	10.846	11.434	10.705	10.328	9.56	10.174	9.652	8.923
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	311	335	316	338	349	384	356	377	409
Service Time	9.309	8.546	9.134	8.405	8.056	7.288	7.874	7.352	6.623
HCM Lane V/C Ratio	0.222	0.579	0.256	0.586	0.221	1.161	0.404	0.626	1.02
HCM Control Delay	17.4	26	17.8	26.2	16	136.7	19	25.4	66.3
HCM Lane LOS	C	D	C	D	C	F	C	D	F
HCM 95th-tile Q	0.8	3.1	0.9	3.2	0.8	18	1.7	3.6	11.2

HCM Signalized Intersection Capacity Analysis
10: Wilson Ave & Novato Blvd #2 02/15/2018

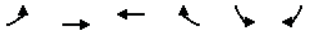
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	430	38	411	694	44	277
Future Volume (vph)	430	38	411	694	44	277
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.9		3.0	3.6	3.6	3.6
Lane Util. Factor	0.95		1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.99		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3527		1787	3610	1805	1593
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3527		1787	3610	1805	1593
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	457	40	437	738	47	295
RTOR Reduction (vph)	6	0	0	0	0	251
Lane Group Flow (vph)	491	0	437	738	47	44
Confl. Peds. (#/hr)		3			6	2
Heavy Vehicles (%)	1%	0%	1%	0%	0%	0%
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases						4
Actuated Green, G (s)	30.9		19.3	38.3	10.7	10.7
Effective Green, g (s)	30.9		19.3	38.3	10.7	10.7
Actuated g/C Ratio	0.43		0.27	0.54	0.15	0.15
Clearance Time (s)	3.9		3.0	3.6	3.6	3.6
Vehicle Extension (s)	3.0		2.0	3.0	2.0	2.0
Lane Grp Cap (vph)	1526		483	1936	270	238
v/s Ratio Prot	c0.14		c0.24	c0.20	0.03	
v/s Ratio Perm						c0.03
v/c Ratio	0.32		0.90	0.38	0.17	0.19
Uniform Delay, d1	13.3		25.2	9.6	26.5	26.5
Progression Factor	1.00		0.85	0.42	1.00	1.00
Incremental Delay, d2	0.6		18.2	0.5	0.1	0.1
Delay (s)	13.9		39.6	4.6	26.6	26.7
Level of Service	B		D	A	C	C
Approach Delay (s)	13.9			17.6	26.7	
Approach LOS	B			B	C	

Intersection Summary			
HCM 2000 Control Delay	18.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	71.4	Sum of lost time (s)	10.5
Intersection Capacity Utilization	57.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
11: Novato Blvd #2 & Simmons Ln

02/15/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	122	585	847	81	89	269
Future Volume (vph)	122	585	847	81	89	269
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.9	3.6		3.0	3.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	3574	3556		1805	1599
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1805	3574	3556		1805	1599
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	130	622	901	86	95	286
RTOR Reduction (vph)	0	0	6	0	0	241
Lane Group Flow (vph)	130	622	981	0	95	45
Confl. Peds. (#/hr)					2	
Confl. Bikes (#/hr)				1		
Heavy Vehicles (%)	0%	1%	0%	0%	0%	1%
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	5	2	6		8	
Permitted Phases						8
Actuated Green, G (s)	12.2	30.9	38.3		11.3	11.3
Effective Green, g (s)	12.2	30.9	38.3		11.3	11.3
Actuated g/C Ratio	0.17	0.43	0.54		0.16	0.16
Clearance Time (s)	3.0	3.9	3.6		3.0	3.0
Vehicle Extension (s)	2.0	3.0	3.0		2.0	2.0
Lane Grp Cap (vph)	308	1546	1907		285	253
v/s Ratio Prot	0.07	c0.17	c0.28		c0.05	
v/s Ratio Perm						0.03
v/c Ratio	0.42	0.40	0.51		0.33	0.18
Uniform Delay, d1	26.4	13.9	10.6		26.7	26.0
Progression Factor	0.73	0.57	1.00		1.00	1.00
Incremental Delay, d2	4.0	0.7	1.0		0.3	0.1
Delay (s)	23.4	8.7	11.6		27.0	26.2
Level of Service	C	A	B		C	C
Approach Delay (s)		11.2	11.6		26.4	
Approach LOS		B	B		C	

Intersection Summary				
HCM 2000 Control Delay	14.1	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.48			
Actuated Cycle Length (s)	71.4	Sum of lost time (s)	10.5	
Intersection Capacity Utilization	49.3%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
12: Grant Ave & Novato Blvd #2

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	122	531	1	2	737	51	1	6	4	24	1	248
Future Volume (vph)	122	531	1	2	737	51	1	6	4	24	1	248
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.5	4.5	3.5	4.9	4.9		4.0		3.5	3.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00		1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.95	1.00	1.00	0.96		0.98		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00		1.00		0.97	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.95		1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		1.00		0.95	1.00	
Satd. Flow (prot)	1787	1863	1534	1805	3539	1529		1762		1737	1595	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.53		0.75	1.00	
Satd. Flow (perm)	1787	1863	1534	1805	3539	1529		940		1372	1595	
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)	127	553	1	2	768	53	1	6	4	25	1	258
RTOR Reduction (vph)	0	0	0	0	0	17	0	4	0	0	232	0
Lane Group Flow (vph)	127	553	1	2	768	36	0	7	0	25	27	0
Confl. Peds. (#/hr)			11			8	1		14	14		1
Confl. Bikes (#/hr)			1			4			2			
Heavy Vehicles (%)	1%	2%	0%	0%	2%	1%	0%	0%	0%	1%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8			4		
Actuated Green, G (s)	12.5	86.2	86.2	1.2	74.5	74.5		10.6		11.1	11.1	
Effective Green, g (s)	12.5	86.2	86.2	1.2	74.5	74.5		10.6		11.1	11.1	
Actuated g/C Ratio	0.11	0.78	0.78	0.01	0.68	0.68		0.10		0.10	0.10	
Clearance Time (s)	3.5	4.5	4.5	3.5	4.9	4.9		4.0		3.5	3.5	
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0	3.0		2.0		2.0	2.0	
Lane Grp Cap (vph)	203	1459	1202	19	2396	1035		90		138	160	
v/s Ratio Prot	c0.07	c0.30		0.00	0.22						0.02	
v/s Ratio Perm			0.00			0.02		0.01		c0.02		
v/c Ratio	0.63	0.38	0.00	0.11	0.32	0.03		0.08		0.18	0.17	
Uniform Delay, d1	46.5	3.7	2.6	53.9	7.3	5.9		45.3		45.3	45.2	
Progression Factor	1.00	1.00	1.00	1.38	0.20	0.14		1.00		1.00	1.00	
Incremental Delay, d2	4.3	0.8	0.0	0.7	0.3	0.1		0.1		0.2	0.2	
Delay (s)	50.8	4.4	2.6	75.1	1.7	0.9		45.4		45.5	45.4	
Level of Service	D	A	A	E	A	A		D		D	D	
Approach Delay (s)		13.1			1.9			45.4			45.4	
Approach LOS		B			A			D			D	

Intersection Summary				
HCM 2000 Control Delay	13.2	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.40			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.4	
Intersection Capacity Utilization	59.1%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
13: Tamalpais Ave/7th St & Novato Blvd #2

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	124	462	39	59	663	205	42	118	39	176	107	106
Future Volume (vph)	124	462	39	59	663	205	42	118	39	176	107	106
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.0		3.5	5.0	5.0	3.5	3.5		3.5	3.5	3.5
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.96	1.00	0.99		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.99	1.00		0.99	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1787	1835		1787	1863	1542	1768	1790		1764	1881	1547
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.62	1.00		0.51	1.00	1.00
Satd. Flow (perm)	1787	1835		1787	1863	1542	1155	1790		941	1881	1547
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)	129	481	41	61	691	214	44	123	41	183	111	110
RTOR Reduction (vph)	0	2	0	0	0	32	0	12	0	0	0	87
Lane Group Flow (vph)	129	520	0	61	691	182	44	152	0	183	111	23
Confl. Peds. (#/hr)			10			6	5		7	7		5
Confl. Bikes (#/hr)			3			2			5			
Heavy Vehicles (%)	1%	2%	1%	1%	2%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8			4		4
Actuated Green, G (s)	12.3	67.5		7.3	62.5	62.5	23.2	23.2		23.2	23.2	23.2
Effective Green, g (s)	12.3	67.5		7.3	62.5	62.5	23.2	23.2		23.2	23.2	23.2
Actuated g/C Ratio	0.11	0.61		0.07	0.57	0.57	0.21	0.21		0.21	0.21	0.21
Clearance Time (s)	3.5	5.0		3.5	5.0	5.0	3.5	3.5		3.5	3.5	3.5
Vehicle Extension (s)	2.0	5.0		2.0	5.0	5.0	2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	199	1126		118	1058	876	243	377		198	396	326
v/s Ratio Prot	c0.07	0.28		0.03	c0.37			0.09			0.06	
v/s Ratio Perm						0.12	0.04			c0.19		0.02
v/c Ratio	0.65	0.46		0.52	0.65	0.21	0.18	0.40		0.92	0.28	0.07
Uniform Delay, d1	46.8	11.5		49.6	16.3	11.6	35.6	37.4		42.5	36.4	34.8
Progression Factor	0.91	1.18		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	5.2	1.3		1.6	3.1	0.5	0.1	0.3		42.3	0.1	0.0
Delay (s)	47.6	14.8		51.2	19.4	12.2	35.7	37.7		84.9	36.5	34.8
Level of Service	D	B		D	B	B	D	D		F	D	C
Approach Delay (s)		21.3			19.8			37.3			58.0	
Approach LOS		C			B			D			E	

Intersection Summary				
HCM 2000 Control Delay	28.8	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	110.0	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
14: Diablo Ave & Novato Blvd #2

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	236	22	255	307	531	49	394	209	375	302	11
Future Volume (vph)	23	236	22	255	307	531	49	394	209	375	302	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	11	11	12	11	11	12	12	12	12
Total Lost time (s)		3.7		4.1	4.1	4.1	4.4	4.4	4.4	4.1	4.1	
Lane Util. Factor		0.95		0.91	0.91	1.00	1.00	1.00	1.00	0.91	0.91	
Frpb, ped/bikes		1.00		1.00	1.00	0.95	1.00	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	1.00	
Frt		0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		1.00		0.95	0.99	1.00	0.95	1.00	1.00	0.95	0.98	
Satd. Flow (prot)		3512		1557	3273	1504	1728	1801	1560	1610	3323	
Flt Permitted		1.00		0.95	0.99	1.00	0.95	1.00	1.00	0.95	0.98	
Satd. Flow (perm)		3512		1557	3273	1504	1728	1801	1560	1610	3323	
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)	24	251	23	271	327	565	52	419	222	399	321	12
RTOR Reduction (vph)	0	5	0	0	0	257	0	0	151	0	2	0
Lane Group Flow (vph)	0	293	0	195	403	308	52	419	71	239	491	0
Confl. Peds. (#/hr)			10			15			2			3
Confl. Bikes (#/hr)			1			1						6
Heavy Vehicles (%)	1%	1%	1%	2%	1%	2%	1%	2%	2%	2%	2%	1%
Turn Type	Split	NA		Split	NA	Perm	Split	NA	Perm	Split	NA	
Protected Phases	3	3		4	4		1	1		2	2	
Permitted Phases						4			1		2	
Actuated Green, G (s)		15.2		26.6	26.6	26.6	30.3	30.3	30.3	21.0	21.0	
Effective Green, g (s)		15.2		26.6	26.6	26.6	30.3	30.3	30.3	21.0	21.0	
Actuated g/C Ratio		0.14		0.24	0.24	0.24	0.28	0.28	0.28	0.19	0.19	
Clearance Time (s)		3.7		4.1	4.1	4.1	4.4	4.4	4.4	4.1	4.1	
Vehicle Extension (s)		2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)		487		378	795	365	478	498	432	309	637	
v/s Ratio Prot		c0.08		0.13	0.12		0.03	c0.23		c0.15	0.15	
v/s Ratio Perm						c0.21			0.05			
v/c Ratio		0.60		0.52	0.51	0.85	0.11	0.84	0.16	0.77	0.77	
Uniform Delay, d1		44.3		35.8	35.7	39.4	29.5	37.3	30.0	41.9	41.9	
Progression Factor		1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		1.4		0.5	0.2	15.6	0.0	11.7	0.1	10.5	5.3	
Delay (s)		45.7		36.3	35.9	55.1	29.5	49.0	30.0	52.4	47.2	
Level of Service		D		D	D	E	C	D	C	D	D	
Approach Delay (s)		45.7			45.3			41.5			48.9	
Approach LOS		D			D			D			D	

Intersection Summary				
HCM 2000 Control Delay	45.3	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.79			
Actuated Cycle Length (s)	109.4	Sum of lost time (s)	16.3	
Intersection Capacity Utilization	77.7%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
15: Redwood Blvd & Diablo Ave/De Long Ave

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	229	533	87	104	904	242	114	233	77	186	138	163
Future Volume (vph)	229	533	87	104	904	242	114	233	77	186	138	163
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	9
Total Lost time (s)	4.0	3.7		4.0	4.1		3.5	4.8	4.8	3.5	3.5	3.5
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95	1.00	0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3467	3534		1805	3396		1805	3610	1508	3303	1900	1393
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3467	3534		1805	3396		1805	3610	1508	3303	1900	1393
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	234	544	89	106	922	247	116	238	79	190	141	166
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	34	0	0	51
Lane Group Flow (vph)	234	633	0	106	1169	0	116	238	45	190	141	115
Confl. Peds. (#/hr)						2			7			14
Confl. Bikes (#/hr)												3
Heavy Vehicles (%)	1%	0%	0%	0%	2%	5%	0%	0%	5%	6%	0%	1%
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)	17.0	65.7		17.0	65.3		14.0	19.1	19.1	12.2	18.6	18.6
Effective Green, g (s)	17.0	65.7		17.0	65.3		14.0	19.1	19.1	12.2	18.6	18.6
Actuated g/C Ratio	0.13	0.51		0.13	0.50		0.11	0.15	0.15	0.09	0.14	0.14
Clearance Time (s)	4.0	3.7		4.0	4.1		3.5	4.8	4.8	3.5	3.5	3.5
Vehicle Extension (s)	2.5	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	453	1786		236	1705		194	530	221	309	271	199
v/s Ratio Prot	c0.07	0.18		0.06	c0.34		c0.06	0.07		0.06	0.07	
v/s Ratio Perm									0.03			c0.08
v/c Ratio	0.52	0.35		0.45	0.69		0.60	0.45	0.20	0.61	0.52	0.58
Uniform Delay, d1	52.7	19.4		52.2	24.6		55.3	50.6	48.8	56.6	51.6	52.0
Progression Factor	1.00	1.00		1.42	0.40		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	0.6		0.4	1.7		3.3	0.2	0.2	2.5	0.8	2.5
Delay (s)	53.4	19.9		74.3	11.4		58.6	50.9	48.9	59.2	52.4	54.5
Level of Service	D	B		E	B		E	D	D	E	D	D
Approach Delay (s)		29.0			16.6			52.6			55.7	
Approach LOS		C			B			D			E	

Intersection Summary				
HCM 2000 Control Delay	31.5	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.63			
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.4	
Intersection Capacity Utilization	91.6%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
16: Reichert Ave & De Long Ave

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	82	682	14	71	1132	322	7	30	29	238	18	79
Future Volume (vph)	82	682	14	71	1132	322	7	30	29	238	18	79
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.1		3.0	4.1		3.5	3.5	3.5	3.5	3.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00	0.98	1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00	1.00	0.99	1.00	
Frt	1.00	1.00		1.00	0.97		1.00	1.00	0.85	1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1805	3527		1805	3416		1794	1900	1577	1763	1635	
Flt Permitted	0.95	1.00		0.95	1.00		0.62	1.00	1.00	0.74	1.00	
Satd. Flow (perm)	1805	3527		1805	3416		1178	1900	1577	1366	1635	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	86	718	15	75	1192	339	7	32	31	251	19	83
RTOR Reduction (vph)	0	1	0	0	14	0	0	0	15	0	28	0
Lane Group Flow (vph)	86	732	0	75	1517	0	7	32	16	251	74	0
Confl. Peds. (#/hr)			5			11	5		5	11		5
Confl. Bikes (#/hr)			5			5			5			5
Heavy Vehicles (%)	0%	2%	0%	0%	1%	1%	0%	0%	0%	1%	0%	0%
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	10.8	83.5		8.5	81.2		27.4	27.4	27.4	27.4	27.4	
Effective Green, g (s)	10.8	83.5		8.5	81.2		27.4	27.4	27.4	27.4	27.4	
Actuated g/C Ratio	0.08	0.64		0.07	0.62		0.21	0.21	0.21	0.21	0.21	
Clearance Time (s)	3.0	4.1		3.0	4.1		3.5	3.5	3.5	3.5	3.5	
Vehicle Extension (s)	2.0	3.0		2.0	3.0		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	149	2265		118	2133		248	400	332	287	344	
v/s Ratio Prot	0.05	0.21		c0.04	c0.44			0.02			0.05	
v/s Ratio Perm							0.01		0.01	c0.18		
v/c Ratio	0.58	0.32		0.64	0.71		0.03	0.08	0.05	0.87	0.21	
Uniform Delay, d1	57.4	10.5		59.2	16.5		40.7	41.2	40.9	49.6	42.4	
Progression Factor	0.80	1.13		0.88	1.02		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.2	0.4		6.6	1.7		0.0	0.0	0.0	23.6	0.1	
Delay (s)	49.0	12.2		58.5	18.6		40.7	41.2	40.9	73.3	42.5	
Level of Service	D	B		E	B		D	D	D	E	D	
Approach Delay (s)		16.0			20.4			41.0			64.4	
Approach LOS		B			C			D			E	

Intersection Summary				
HCM 2000 Control Delay	25.1	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.73			
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	10.6	
Intersection Capacity Utilization	79.7%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
17: US 101 SB Ramps & De Long Ave

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	197	793	27	1483	0	0	0	0	9	7	166
Future Volume (vph)	0	197	793	27	1483	0	0	0	0	9	7	166
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.6	3.6	3.0	3.6					4.0	4.0	
Lane Util. Factor		0.95	1.00	1.00	0.95					0.95	0.95	
Frt		1.00	0.85	1.00	1.00					1.00	0.86	
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (prot)		3574	1599	1770	3539					1681	1516	
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (perm)		3574	1599	1770	3539					1681	1516	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	201	809	28	1513	0	0	0	0	9	7	169
RTOR Reduction (vph)	0	0	273	0	0	0	0	0	0	0	51	0
Lane Group Flow (vph)	0	201	536	28	1513	0	0	0	0	8	126	0
Heavy Vehicles (%)	0%	1%	1%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type		NA	Perm	Prot	NA					Split	NA	
Protected Phases		6		5	2					4	4	
Permitted Phases			6									
Actuated Green, G (s)		43.1	43.1	1.7	47.8					9.6	9.6	
Effective Green, g (s)		43.1	43.1	1.7	47.8					9.6	9.6	
Actuated g/C Ratio		0.66	0.66	0.03	0.74					0.15	0.15	
Clearance Time (s)		3.6	3.6	3.0	3.6					4.0	4.0	
Vehicle Extension (s)		4.0	4.0	2.0	4.0					2.5	2.5	
Lane Grp Cap (vph)		2369	1060	46	2602					248	223	
v/s Ratio Prot		0.06		0.02	c0.43					0.00	c0.08	
v/s Ratio Perm			0.34									
v/c Ratio		0.08	0.51	0.61	0.58					0.03	0.56	
Uniform Delay, d1		3.9	5.6	31.3	4.0					23.7	25.8	
Progression Factor		1.05	9.73	0.77	0.43					1.00	1.00	
Incremental Delay, d2		0.1	1.6	7.4	0.5					0.0	2.6	
Delay (s)		4.2	55.6	31.5	2.2					23.8	28.4	
Level of Service		A	E	C	A					C	C	
Approach Delay (s)		45.4			2.7			0.0			28.2	
Approach LOS		D			A			A			C	

Intersection Summary				
HCM 2000 Control Delay	20.2	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.61			
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	10.6	
Intersection Capacity Utilization	107.9%	ICU Level of Service	G	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
18: US 101 NB Ramps & De Long Ave

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	167	41	0	0	60	28	1436	24	30	0	0	0
Future Volume (vph)	167	41	0	0	60	28	1436	24	30	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.6			3.6		4.5	4.5				
Lane Util. Factor	1.00	0.95			0.95		0.95	0.95				
Frpb, ped/bikes	1.00	1.00			1.00		1.00	1.00				
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00				
Frt	1.00	1.00			0.95		1.00	0.99				
Flt Protected	0.95	1.00			1.00		0.95	0.96				
Satd. Flow (prot)	1770	3610			3351		1698	1695				
Flt Permitted	0.95	1.00			1.00		0.95	0.96				
Satd. Flow (perm)	1770	3610			3351		1698	1695				
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)	174	43	0	0	62	29	1496	25	31	0	0	0
RTOR Reduction (vph)	0	0	0	0	26	0	0	2	0	0	0	0
Lane Group Flow (vph)	174	43	0	0	66	0	778	772	0	0	0	0
Confl. Peds. (#/hr)						1						
Heavy Vehicles (%)	2%	0%	0%	0%	0%	7%	1%	0%	6%	0%	0%	0%
Turn Type	Prot	NA			NA		Split	NA				
Protected Phases	1	6			2		4	4				
Permitted Phases												
Actuated Green, G (s)	14.4	24.3			6.4		32.6	32.6				
Effective Green, g (s)	14.4	24.3			6.4		32.6	32.6				
Actuated g/C Ratio	0.22	0.37			0.10		0.50	0.50				
Clearance Time (s)	3.5	3.6			3.6		4.5	4.5				
Vehicle Extension (s)	2.5	2.0			2.0		3.0	3.0				
Lane Grp Cap (vph)	392	1349			329		851	850				
v/s Ratio Prot	c0.10	0.01			c0.02		c0.46	0.46				
v/s Ratio Perm												
v/c Ratio	0.44	0.03			0.20		0.91	0.91				
Uniform Delay, d1	21.8	12.9			26.9		14.9	14.8				
Progression Factor	1.16	1.11			1.00		1.00	1.00				
Incremental Delay, d2	0.6	0.0			0.1		16.0	15.3				
Delay (s)	25.8	14.3			27.1		30.9	30.1				
Level of Service	C	B			C		C	C				
Approach Delay (s)		23.5			27.1			30.5			0.0	
Approach LOS		C			C			C			A	

Intersection Summary				
HCM 2000 Control Delay	29.5	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.70			
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	11.6	
Intersection Capacity Utilization	107.9%	ICU Level of Service	G	
Analysis Period (min)	15			
c Critical Lane Group				

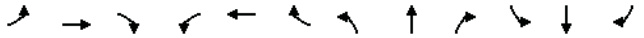
HCM Signalized Intersection Capacity Analysis
19: Redwood Blvd & Lamont Ave 02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	4	23	46	3	50	21	399	60	70	316	15
Future Volume (vph)	31	4	23	46	3	50	21	399	60	70	316	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	3.5		3.5	3.5	3.5	4.8		3.5	4.8	4.8
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes		1.00	1.00		1.00	0.99	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85		1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected		0.96	1.00		0.95	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1820	1615		1814	1595	1805	3529		1805	3610	1615
Flt Permitted		0.76	1.00		0.73	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1445	1615		1393	1595	1805	3529		1805	3610	1615
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	36	5	26	53	3	57	24	459	69	80	363	17
RTOR Reduction (vph)	0	0	21	0	0	47	0	10	0	0	0	7
Lane Group Flow (vph)	0	41	5	0	56	10	24	518	0	80	363	10
Confl. Peds. (#/hr)	1					1			2			
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8		8	4		4						2
Actuated Green, G (s)		8.6	8.6		8.6	8.6	0.9	23.8		5.1	28.0	28.0
Effective Green, g (s)		8.6	8.6		8.6	8.6	0.9	23.8		5.1	28.0	28.0
Actuated g/C Ratio		0.17	0.17		0.17	0.17	0.02	0.48		0.10	0.57	0.57
Clearance Time (s)		3.5	3.5		3.5	3.5	3.5	4.8		3.5	4.8	4.8
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0	3.0		2.0	3.0	3.0
Lane Grp Cap (vph)		252	281		242	278	32	1703		186	2050	917
v/s Ratio Prot							0.01	c0.15		c0.04	0.10	
v/s Ratio Perm		0.03	0.00		c0.04	0.01						0.01
v/c Ratio		0.16	0.02		0.23	0.04	0.75	0.30		0.43	0.18	0.01
Uniform Delay, d1		17.3	16.8		17.5	16.9	24.1	7.7		20.7	5.1	4.6
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		0.1	0.0		0.2	0.0	59.6	0.1		0.6	0.0	0.0
Delay (s)		17.4	16.9		17.7	16.9	83.7	7.8		21.3	5.2	4.6
Level of Service		B	B		B	B	F	A		C	A	A
Approach Delay (s)		17.2			17.3			11.1			7.9	
Approach LOS		B			B			B			A	

Intersection Summary				
HCM 2000 Control Delay	10.8	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.30			
Actuated Cycle Length (s)	49.3	Sum of lost time (s)	11.8	
Intersection Capacity Utilization	43.4%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
20: Redwood Blvd & Landing Ct 02/15/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	3	13	0	11	1	482	17	9	443	1
Future Volume (vph)	0	0	3	13	0	11	1	482	17	9	443	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5		3.5		3.5		4.8	4.8	3.5	4.8	4.8
Lane Util. Factor		1.00		1.00		1.00		0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes		0.99		1.00		1.00		1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes		1.00		1.00		1.00		1.00	1.00	1.00	1.00	1.00
Frt		0.86		1.00		0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected		1.00		0.95		1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1622		1803		1615		3610	1579	1805	3610	1572
Flt Permitted		1.00		1.00		1.00		0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1622		1898		1615		3446	1579	1805	3610	1572
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	0	3	14	0	12	1	536	19	10	492	1
RTOR Reduction (vph)	0	3	0	0	0	11	0	0	7	0	0	0
Lane Group Flow (vph)	0	0	0	14	0	1	0	537	12	10	492	1
Confl. Peds. (#/hr)			4	4					3			6
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type		NA		Perm		Perm	Perm	NA	Perm	Prot	NA	Perm
Protected Phases		4						2		1	6	
Permitted Phases	4			8		8	2		2			6
Actuated Green, G (s)		3.8		3.8		3.8		28.6	28.6	0.7	32.8	32.8
Effective Green, g (s)		3.8		3.8		3.8		28.6	28.6	0.7	32.8	32.8
Actuated g/C Ratio		0.08		0.08		0.08		0.64	0.64	0.02	0.73	0.73
Clearance Time (s)		3.5		3.5		3.5		4.8	4.8	3.5	4.8	4.8
Vehicle Extension (s)		3.0		2.0		2.0		4.0	4.0	2.0	4.0	4.0
Lane Grp Cap (vph)		137		160		136		2195	1005	28	2637	1148
v/s Ratio Prot		0.00								0.01	c0.14	
v/s Ratio Perm				c0.01		0.00		c0.16	0.01			0.00
v/c Ratio		0.00		0.09		0.01		0.24	0.01	0.36	0.19	0.00
Uniform Delay, d1		18.8		19.0		18.8		3.5	3.0	21.9	1.9	1.6
Progression Factor		1.00		1.00		1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.0		0.1		0.0		0.1	0.0	2.8	0.0	0.0
Delay (s)		18.8		19.0		18.8		3.6	3.0	24.7	1.9	1.6
Level of Service		B		B		B		A	A	C	A	A
Approach Delay (s)		18.8			18.9			3.6			2.4	
Approach LOS		B			B			A			A	

Intersection Summary				
HCM 2000 Control Delay	3.4	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.23			
Actuated Cycle Length (s)	44.9	Sum of lost time (s)	11.8	
Intersection Capacity Utilization	39.7%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
21: Novato Blvd #3 & Center Rd/Garden Ct

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	148	1	183	4	2	2	176	499	5	2	495	97
Future Volume (vph)	148	1	183	4	2	2	176	499	5	2	495	97
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.2	3.2			3.0		3.0	4.4		3.0	4.4	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00			1.00		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	
Frt	1.00	0.85			0.97		1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1616			1791		1805	3604		1805	3474	
Flt Permitted	0.75	1.00			0.90		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1430	1616			1660		1805	3604		1805	3474	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	161	1	199	4	2	2	191	542	5	2	538	105
RTOR Reduction (vph)	0	166	0	0	2	0	0	0	0	0	11	0
Lane Group Flow (vph)	161	34	0	0	6	0	191	547	0	2	632	0
Confl. Peds. (#/hr)									9			6
Confl. Bikes (#/hr)									2			
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4								
Actuated Green, G (s)	16.8	16.8			17.0		15.1	70.4		2.2	57.5	
Effective Green, g (s)	16.8	16.8			17.0		15.1	70.4		2.2	57.5	
Actuated g/C Ratio	0.17	0.17			0.17		0.15	0.70		0.02	0.58	
Clearance Time (s)	3.2	3.2			3.0		3.0	4.4		3.0	4.4	
Vehicle Extension (s)	3.0	3.0			2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	240	271			282		272	2537		39	1997	
v/s Ratio Prot		0.02					c0.11	0.15		0.00	c0.18	
v/s Ratio Perm	c0.11				0.00							
v/c Ratio	0.67	0.13			0.02		0.70	0.22		0.05	0.32	
Uniform Delay, d1	39.0	35.4			34.6		40.3	5.2		47.9	11.0	
Progression Factor	1.00	1.00			1.00		0.95	1.75		1.00	1.00	
Incremental Delay, d2	7.2	0.2			0.0		6.4	0.2		0.2	0.4	
Delay (s)	46.2	35.6			34.6		44.5	9.2		48.1	11.5	
Level of Service	D	D			C		D	A		D	B	
Approach Delay (s)		40.3			34.6			18.4			11.6	
Approach LOS		D			C			B			B	

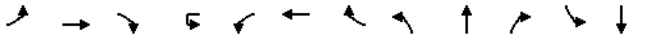
Intersection Summary				
HCM 2000 Control Delay	20.5	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.45			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.6	
Intersection Capacity Utilization	53.7%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
22: Novato Blvd #3 & Arthur Street

02/15/2018

Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	89	122	150	711	7	625	83
Future Volume (vph)	89	122	150	711	7	625	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5	3.5	4.9	3.5	4.9	
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	0.95	
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	1.00	0.98	
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1797	1589	1805	3574	1805	3547	
Flt Permitted	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (perm)	1797	1589	1805	3574	1805	3547	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	98	134	165	781	8	687	91
RTOR Reduction (vph)	0	117	0	0	0	6	0
Lane Group Flow (vph)	98	17	165	781	8	772	0
Confl. Peds. (#/hr)	4	2					
Confl. Bikes (#/hr)		1					
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%	0%
Turn Type	Perm	Perm	Prot	NA	Prot	NA	
Protected Phases			1	6	5	2	
Permitted Phases	4	4					
Actuated Green, G (s)	12.5	12.5	13.7	74.4	1.2	61.9	
Effective Green, g (s)	12.5	12.5	13.7	74.4	1.2	61.9	
Actuated g/C Ratio	0.12	0.12	0.14	0.74	0.01	0.62	
Clearance Time (s)	3.5	3.5	3.5	4.9	3.5	4.9	
Vehicle Extension (s)	2.0	2.0	2.0	4.0	2.0	4.0	
Lane Grp Cap (vph)	224	198	247	2659	21	2195	
v/s Ratio Prot			c0.09	0.22	0.00	c0.22	
v/s Ratio Perm	c0.05	0.01					
v/c Ratio	0.44	0.08	0.67	0.29	0.38	0.35	
Uniform Delay, d1	40.5	38.7	41.0	4.2	49.0	9.3	
Progression Factor	1.00	1.00	0.99	0.82	0.87	0.79	
Incremental Delay, d2	0.5	0.1	3.6	0.2	4.0	0.4	
Delay (s)	41.0	38.8	44.3	3.6	46.6	7.7	
Level of Service	D	D	D	A	D	A	
Approach Delay (s)	39.7			10.7		8.1	
Approach LOS	D			B		A	

Intersection Summary				
HCM 2000 Control Delay	13.1	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.41			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.9	
Intersection Capacity Utilization	45.1%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				



Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	38	122	15	28	160	193	503	27	304	152	375	336
Future Volume (vph)	38	122	15	28	160	193	503	27	304	152	375	336
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5			3.5	4.1	4.1	3.5	4.1		3.5	4.4
Lane Util. Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00		0.97	1.00
Frpb, ped/bikes	1.00	0.99			1.00	1.00	0.99	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	1.00
Frt	1.00	0.98			1.00	1.00	0.85	1.00	0.95		1.00	0.98
Flt Protected	0.95	1.00			0.95	1.00	1.00	0.95	1.00		0.95	1.00
Satd. Flow (prot)	1805	1859			1790	1900	1592	1805	1776		3502	1847
Flt Permitted	0.95	1.00			0.95	1.00	1.00	0.95	1.00		0.95	1.00
Satd. Flow (perm)	1805	1859			1790	1900	1592	1805	1776		3502	1847
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	43	137	17	31	180	217	565	30	342	171	421	378
RTOR Reduction (vph)	0	5	0	0	0	0	371	0	18	0	0	5
Lane Group Flow (vph)	43	149	0	0	211	217	194	30	495	0	421	442
Confl. Peds. (#/hr)			13				2			5		
Confl. Bikes (#/hr)			1							1		
Heavy Vehicles (%)	0%	0%	0%	0%	1%	0%	0%	0%	1%	1%	0%	0%
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Prot	NA		Prot	NA
Protected Phases	3	8		7	7	4		1	6		5	2
Permitted Phases							4					
Actuated Green, G (s)	5.4	15.7			14.2	23.9	23.9	6.0	34.6		20.9	49.2
Effective Green, g (s)	5.4	15.7			14.2	23.9	23.9	6.0	34.6		20.9	49.2
Actuated g/C Ratio	0.05	0.16			0.14	0.24	0.24	0.06	0.35		0.21	0.49
Clearance Time (s)	3.5	3.5			3.5	4.1	4.1	3.5	4.1		3.5	4.4
Vehicle Extension (s)	2.0	2.0			2.0	2.0	2.0	2.0	3.0		2.0	2.0
Lane Grp Cap (vph)	97	291			254	454	380	108	614		731	908
v/s Ratio Prot	0.02	0.08			c0.12	0.11		0.02	c0.28		c0.12	0.24
v/s Ratio Perm							c0.12					
v/c Ratio	0.44	0.51			0.83	0.48	0.51	0.28	0.81		0.58	0.49
Uniform Delay, d1	45.8	38.6			41.7	32.7	33.0	44.9	29.7		35.6	17.0
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00		1.18	0.69
Incremental Delay, d2	1.2	0.6			19.3	0.3	0.5	0.5	7.6		3.2	1.8
Delay (s)	47.0	39.3			61.0	33.0	33.5	45.4	37.3		45.0	13.6
Level of Service	D	D			E	C	C	D	D		D	B
Approach Delay (s)		41.0				39.2			37.8			28.8
Approach LOS		D				D			D			C

Intersection Summary				
HCM 2000 Control Delay	35.6	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.5	
Intersection Capacity Utilization	74.5%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
23: Novato Blvd #3 & Rowland Boulevard 02/15/2018

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	61
Future Volume (vph)	61
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.89
Adj. Flow (vph)	69
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	6
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	0%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Novato General Plan Update EIR W-Trans
PM Peak Hour Existing Conditions

HCM Signalized Intersection Capacity Analysis
24: Rowland Boulevard & Redwood Blvd 02/15/2018

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	107	549	47	1	134	818	310	23	29	61	267	26
Future Volume (vph)	107	549	47	1	134	818	310	23	29	61	267	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.5	4.5		3.5	4.5		3.5	4.1		3.5	4.8
Lane Util. Factor	1.00	0.95	1.00		1.00	0.95		1.00	0.95		0.97	1.00
Frpb, ped/bikes	1.00	1.00	0.98		1.00	1.00		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	1.00
Frt	1.00	1.00	0.85		1.00	0.96		1.00	0.90		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00		0.95	1.00		0.95	1.00
Satd. Flow (prot)	1805	3574	1590		1805	3447		1805	3209		3502	1900
Flt Permitted	0.95	1.00	1.00		0.95	1.00		0.95	1.00		0.95	1.00
Satd. Flow (perm)	1805	3574	1590		1805	3447		1805	3209		3502	1900
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	122	624	53	1	152	930	352	26	33	69	303	30
RTOR Reduction (vph)	0	0	31	0	0	30	0	0	59	0	0	0
Lane Group Flow (vph)	122	624	22	0	153	1252	0	26	43	0	303	30
Confl. Peds. (#/hr)			4				4			3		
Confl. Bikes (#/hr)										1		
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	Prot	NA		Prot	NA		Prot	NA
Protected Phases	5	2		1	1	6		3	8		7	4
Permitted Phases			2									
Actuated Green, G (s)	11.3	38.5	38.5		12.8	40.0		4.0	13.9		12.4	21.6
Effective Green, g (s)	11.3	38.5	38.5		12.8	40.0		4.0	13.9		12.4	21.6
Actuated g/C Ratio	0.12	0.41	0.41		0.14	0.43		0.04	0.15		0.13	0.23
Clearance Time (s)	3.5	4.5	4.5		3.5	4.5		3.5	4.1		3.5	4.8
Vehicle Extension (s)	2.0	4.0	4.0		2.0	4.0		2.0	2.5		2.5	2.5
Lane Grp Cap (vph)	218	1476	656		247	1479		77	478		465	440
v/s Ratio Prot	0.07	0.17			c0.08	c0.36		0.01	0.01		c0.09	0.02
v/s Ratio Perm			0.01									
v/c Ratio	0.56	0.42	0.03		0.62	0.85		0.34	0.09		0.65	0.07
Uniform Delay, d1	38.6	19.4	16.3		37.9	23.9		43.3	34.2		38.3	27.9
Progression Factor	1.00	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	1.8	0.3	0.0		3.2	4.9		1.0	0.1		2.9	0.0
Delay (s)	40.4	19.7	16.3		41.1	28.7		44.3	34.3		41.3	28.0
Level of Service	D	B	B		D	C		D	C		D	C
Approach Delay (s)		22.6				30.0			36.3			36.3
Approach LOS		C				C			D			D

Intersection Summary			
HCM 2000 Control Delay	29.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	93.2	Sum of lost time (s)	16.3
Intersection Capacity Utilization	68.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
24: Rowland Boulevard & Redwood Blvd 02/15/2018

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	138
Future Volume (vph)	138
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.8
Lane Util. Factor	1.00
Frpb, ped/bikes	0.99
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1593
Flt Permitted	1.00
Satd. Flow (perm)	1593
Peak-hour factor, PHF	0.88
Adj. Flow (vph)	157
RTOR Reduction (vph)	121
Lane Group Flow (vph)	36
Confl. Peds. (#/hr)	2
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	0%
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	21.6
Effective Green, g (s)	21.6
Actuated g/C Ratio	0.23
Clearance Time (s)	4.8
Vehicle Extension (s)	2.5
Lane Grp Cap (vph)	369
v/s Ratio Prot	
v/s Ratio Perm	c0.02
v/c Ratio	0.10
Uniform Delay, d1	28.1
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	28.2
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary

Novato General Plan Update EIR W-Trans
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HCM Signalized Intersection Capacity Analysis
25: Rowland Boulevard & Highway 101 SB Ramps 02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	360	528	609	1108	0	0	0	0	250	6	133
Future Volume (vph)	0	360	528	609	1108	0	0	0	0	250	6	133
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	3.0	4.0					3.0	3.0	
Lane Util. Factor		0.91	0.91	0.97	0.95					0.91	0.91	
Frpb, ped/bikes		0.99	0.99	1.00	1.00					1.00	0.99	
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	
Frt		0.94	0.85	1.00	1.00					1.00	0.92	
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.98	
Satd. Flow (prot)		3209	1450	3502	3610					1643	3065	
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.98	
Satd. Flow (perm)		3209	1450	3502	3610					1643	3065	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	0	400	587	677	1231	0	0	0	0	278	7	148
RTOR Reduction (vph)	0	121	212	0	0	0	0	0	0	0	23	0
Lane Group Flow (vph)	0	555	99	677	1231	0	0	0	0	150	260	0
Confl. Peds. (#/hr)			2									7
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	33%	0%
Turn Type		NA	Perm	Prot	NA					Split	NA	
Protected Phases		2		1	6					4	4	
Permitted Phases			2									
Actuated Green, G (s)		16.9	16.9	13.8	33.7					12.3	12.3	
Effective Green, g (s)		16.9	16.9	13.8	33.7					12.3	12.3	
Actuated g/C Ratio		0.32	0.32	0.26	0.64					0.23	0.23	
Clearance Time (s)		4.0	4.0	3.0	4.0					3.0	3.0	
Vehicle Extension (s)		4.0	4.0	2.0	2.5					2.0	2.0	
Lane Grp Cap (vph)		1023	462	911	2295					381	711	
v/s Ratio Prot		0.17		c0.19	c0.34					c0.09	0.08	
v/s Ratio Perm			0.07									
v/c Ratio		0.54	0.21	0.74	0.54					0.39	0.37	
Uniform Delay, d1		14.9	13.2	18.0	5.3					17.2	17.1	
Progression Factor		1.00	1.00	1.00	1.00					1.00	1.00	
Incremental Delay, d2		0.7	0.3	2.9	0.2					0.2	0.1	
Delay (s)		15.6	13.5	20.9	5.5					17.4	17.2	
Level of Service		B	B	C	A					B	B	
Approach Delay (s)		15.0			11.0			0.0			17.3	
Approach LOS		B			B			A			B	

Intersection Summary				
HCM 2000 Control Delay	13.0	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.59			
Actuated Cycle Length (s)	53.0	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	62.0%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
26: Highway 101 NB Ramps & Rowland Boulevard 02/15/2018

Movement	EBL2	EBL	EBT	WBT	WBR	WBR2	NBL2	NBL	NBT	NBR	NEL2	NEL
Lane Configurations												
Traffic Volume (vph)	3	65	551	948	1	422	732	11	1	664	18	18
Future Volume (vph)	3	65	551	948	1	422	732	11	1	664	18	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	4.0	4.0		4.0	3.5		3.5	3.0		3.5
Lane Util. Factor		1.00	0.95	0.86		0.86	0.95		0.95	0.88		1.00
Frpb, ped/bikes		1.00	1.00	1.00		1.00	1.00		1.00	1.00		1.00
Flpb, ped/bikes		1.00	1.00	1.00		1.00	1.00		1.00	1.00		1.00
Frt		1.00	1.00	0.98		0.85	1.00		1.00	0.85		0.98
Flt Protected		0.95	1.00	1.00		1.00	0.95		0.95	1.00		0.96
Satd. Flow (prot)		1804	3574	4622		1323	1715		1718	2842		1745
Flt Permitted		0.95	1.00	1.00		1.00	0.95		0.95	1.00		0.96
Satd. Flow (perm)		1804	3574	4622		1323	1715		1718	2842		1745
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	3	70	592	1019	1	454	787	12	1	714	19	19
RTOR Reduction (vph)	0	0	0	10	0	178	0	0	0	0	0	0
Lane Group Flow (vph)	0	73	592	1133	0	153	401	0	399	714	0	43
Confl. Peds. (#/hr)					1					8		
Heavy Vehicles (%)	2%	0%	1%	4%	0%	5%	0%	2%	13%	0%	2%	0%
Turn Type	Prot	Prot	NA	NA		Perm	Split	Split	NA	custom	Perm	Prot
Protected Phases	5	5	2	6			8	8	8	1 8		7
Permitted Phases						6					7	
Actuated Green, G (s)		7.5	52.0	55.5		55.5	34.2		34.2	45.2		8.8
Effective Green, g (s)		7.5	52.0	55.5		55.5	34.2		34.2	45.2		8.8
Actuated g/C Ratio		0.06	0.43	0.46		0.46	0.29		0.29	0.38		0.07
Clearance Time (s)		3.0	4.0	4.0		4.0	3.5		3.5			3.5
Vehicle Extension (s)		2.0	2.0	2.0		2.0	2.0		2.0			2.0
Lane Grp Cap (vph)		112	1548	2137		611	488		489	1070		127
v/s Ratio Prot		0.04	0.17	c0.25			c0.23		0.23	c0.25		
v/s Ratio Perm						0.12						0.02
v/c Ratio		0.65	0.38	0.53		0.25	0.82		0.82	0.67		0.34
Uniform Delay, d1		55.0	23.1	23.0		19.6	40.1		40.0	31.1		52.8
Progression Factor		1.00	1.00	0.77		1.04	1.00		1.00	1.00		1.00
Incremental Delay, d2		9.9	0.7	0.9		0.9	10.2		9.6	1.2		0.6
Delay (s)		64.9	23.8	18.6		21.2	50.3		49.6	32.4		53.4
Level of Service		E	C	B		C	D		D	C		D
Approach Delay (s)			28.3	19.2					41.6			53.4
Approach LOS			C	B					D			D

Intersection Summary				
HCM 2000 Control Delay	30.4	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.63			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.0	
Intersection Capacity Utilization	74.0%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
26: Highway 101 NB Ramps & Rowland Boulevard 02/15/2018

Movement	NER
Lane Configurations	
Traffic Volume (vph)	5
Future Volume (vph)	5
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.93
Adj. Flow (vph)	5
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	15%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary			

HCM Signalized Intersection Capacity Analysis
27: Rowland Boulevard & Rowland Way 02/15/2018

Movement	EBU	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Volume (vph)	6	219	985	1029	26	36	339
Future Volume (vph)	6	219	985	1029	26	36	339
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	4.0	4.0		3.2	3.2
Lane Util. Factor		0.97	0.91	0.95		1.00	0.95
Frpb, ped/bikes		1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00		1.00	1.00
Frt		1.00	1.00	1.00		0.88	0.85
Flt Protected		0.95	1.00	1.00		0.99	1.00
Satd. Flow (prot)		3468	5187	3588		1634	1519
Flt Permitted		0.95	1.00	1.00		0.99	1.00
Satd. Flow (perm)		3468	5187	3588		1634	1519
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	6	226	1015	1061	27	37	349
RTOR Reduction (vph)	0	0	0	1	0	140	171
Lane Group Flow (vph)	0	232	1015	1087	0	54	21
Confl. Peds. (#/hr)					12	2	
Heavy Vehicles (%)	0%	1%	0%	0%	7%	2%	1%
Turn Type	Prot	Prot	NA	NA		Prot	Perm
Protected Phases	5	5	2	6		4	
Permitted Phases							4
Actuated Green, G (s)		12.6	99.8	83.7		13.0	13.0
Effective Green, g (s)		12.6	99.8	83.7		13.0	13.0
Actuated g/C Ratio		0.10	0.83	0.70		0.11	0.11
Clearance Time (s)		3.5	4.0	4.0		3.2	3.2
Vehicle Extension (s)		2.0	4.0	4.0		2.0	2.0
Lane Grp Cap (vph)		364	4313	2502		177	164
v/s Ratio Prot		c0.07	0.20	c0.30		c0.03	
v/s Ratio Perm							0.01
v/c Ratio		0.64	0.24	0.43		0.31	0.13
Uniform Delay, d1		51.5	2.1	7.9		49.3	48.4
Progression Factor		1.02	1.33	0.72		1.00	1.00
Incremental Delay, d2		2.4	0.1	0.5		0.4	0.1
Delay (s)		55.1	2.9	6.2		49.7	48.5
Level of Service		E	A	A		D	D
Approach Delay (s)			12.6	6.2		49.1	
Approach LOS			B	A		D	

Intersection Summary				
HCM 2000 Control Delay	15.2	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.44			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.7	
Intersection Capacity Utilization	61.6%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
28: Rowland Boulevard & Vintage Way

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	205	791	2	255	6	799	3	2	4	3	0
Future Volume (vph)	17	205	791	2	255	6	799	3	2	4	3	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0	4.0	3.0	4.0		3.6	3.6			3.2	
Lane Util. Factor	1.00	0.95	0.88	1.00	0.95		0.97	1.00			1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	0.99			1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.94			1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00			0.97	
Satd. Flow (prot)	1805	3539	2842	1805	3558		3502	1768			1847	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00			0.97	
Satd. Flow (perm)	1805	3539	2842	1805	3558		3502	1768			1847	
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)	18	218	841	2	271	6	850	3	2	4	3	0
RTOR Reduction (vph)	0	0	0	0	1	0	0	1	0	0	0	0
Lane Group Flow (vph)	18	218	841	2	276	0	850	4	0	0	7	0
Confl. Peds. (#/hr)			9	9		13			11			
Confl. Bikes (#/hr)			2			2						
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Prot	NA	pt+ov	Prot	NA		Split	NA		Split	NA	
Protected Phases	5	2	2 3	1	6		3	3		4	4	
Permitted Phases												
Actuated Green, G (s)	5.4	49.6	105.0	2.8	47.0		51.4	51.4			2.4	
Effective Green, g (s)	5.4	49.6	105.0	2.8	47.0		51.4	51.4			2.4	
Actuated g/C Ratio	0.05	0.41	0.88	0.02	0.39		0.43	0.43			0.02	
Clearance Time (s)	3.0	4.0		3.0	4.0		3.6	3.6			3.2	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		3.0	3.0			2.0	
Lane Grp Cap (vph)	81	1462	2486	42	1393		1500	757			36	
v/s Ratio Prot	0.01	0.06	c0.30	0.00	c0.08		c0.24	0.00			c0.00	
v/s Ratio Perm												
v/c Ratio	0.22	0.15	0.34	0.05	0.20		0.57	0.01			0.19	
Uniform Delay, d1	55.3	22.0	1.3	57.3	24.1		25.9	19.7			57.8	
Progression Factor	1.22	1.27	0.64	1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.5	0.2	0.4	0.2	0.3		1.6	0.0			1.0	
Delay (s)	67.7	28.1	1.2	57.5	24.4		27.4	19.7			58.8	
Level of Service	E	C	A	E	C		C	B			E	
Approach Delay (s)		7.8			24.6			27.4			58.8	
Approach LOS		A			C			C			E	

Intersection Summary				
HCM 2000 Control Delay	17.6	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.45			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.8	
Intersection Capacity Utilization	59.5%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
29: Novato Blvd #3 & Sunset Parkway

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	152	18	33	30	11	36	44	260	51	34	302	154
Future Volume (vph)	152	18	33	30	11	36	44	260	51	34	302	154
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.0		3.5	3.5		3.5	4.9		3.5	4.6	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.98		1.00	0.98		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.90		1.00	0.89		1.00	0.98		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)	1787	1674		1805	1642		1805	1831		1805	1798	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1787	1674		1805	1642		1805	1831		1805	1798	
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)	162	19	35	32	12	38	47	277	54	36	321	164
RTOR Reduction (vph)	0	28	0	0	34	0	0	6	0	0	14	0
Lane Group Flow (vph)	162	26	0	32	16	0	47	325	0	36	471	0
Confl. Peds. (#/hr)			11			6			3			
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	1%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases												
Actuated Green, G (s)	12.2	17.2		3.4	8.9		5.3	38.9		5.3	39.2	
Effective Green, g (s)	12.2	17.2		3.4	8.9		5.3	38.9		5.3	39.2	
Actuated g/C Ratio	0.15	0.21		0.04	0.11		0.07	0.48		0.07	0.49	
Clearance Time (s)	3.5	4.0		3.5	3.5		3.5	4.9		3.5	4.6	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	270	356		76	181		118	882		118	873	
v/s Ratio Prot	c0.09	c0.02		0.02	0.01		c0.03	0.18		0.02	c0.26	
v/s Ratio Perm												
v/c Ratio	0.60	0.07		0.42	0.09		0.40	0.37		0.31	0.54	
Uniform Delay, d1	32.0	25.4		37.7	32.3		36.2	13.2		35.9	14.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.4	0.0		1.4	0.1		0.8	1.2		0.5	2.4	
Delay (s)	34.4	25.4		39.1	32.3		37.0	14.4		36.5	16.8	
Level of Service	C	C		D	C		D	B		D	B	
Approach Delay (s)		32.1			35.0			17.2			18.2	
Approach LOS		C			C			B			B	

Intersection Summary				
HCM 2000 Control Delay	21.5	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.48			
Actuated Cycle Length (s)	80.7	Sum of lost time (s)	15.9	
Intersection Capacity Utilization	61.1%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM 2010 AWSC
30: Redwood Blvd & Novato Blvd #3 02/15/2018

Intersection	
Intersection Delay, s/veh	33.7
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	44	261	52	49	352	109	91	13	114	84	10	46
Future Vol, veh/h	44	261	52	49	352	109	91	13	114	84	10	46
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	1	2	1	1	2	1	1	1	1	1	1	1
Mvmt Flow	46	275	55	52	371	115	96	14	120	88	11	48
Number of Lanes	1	1	0	1	1	0	1	1	1	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	3	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	2	2	2
HCM Control Delay	24.5	54.2	13.7	13.8
HCM LOS	C	F	B	B

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	100%	0%	0%	83%	0%	76%	0%	18%
Vol Right, %	0%	0%	100%	0%	17%	0%	24%	0%	82%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	91	13	114	44	313	49	461	84	56
LT Vol	91	0	0	44	0	49	0	84	0
Through Vol	0	13	0	0	261	0	352	0	10
RT Vol	0	0	114	0	52	0	109	0	46
Lane Flow Rate	96	14	120	46	329	52	485	88	59
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.241	0.033	0.261	0.106	0.697	0.112	0.965	0.23	0.135
Departure Headway (Hd)	9.069	8.552	7.829	8.334	7.722	7.817	7.158	9.347	8.229
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	398	421	462	433	471	456	505	386	438
Service Time	6.769	6.252	5.529	6.034	5.422	5.613	4.953	7.057	5.938
HCM Lane V/C Ratio	0.241	0.033	0.26	0.106	0.699	0.114	0.96	0.228	0.135
HCM Control Delay	14.6	11.5	13.3	12	26.3	11.6	58.7	14.8	12.2
HCM Lane LOS	B	B	B	B	D	B	F	B	B
HCM 95th-tile Q	0.9	0.1	1	0.4	5.3	0.4	12.4	0.9	0.5

HCM Signalized Intersection Capacity Analysis
31: Alameda Del Prado & Ignacio Blvd 02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	412	77	331	688	34	97	4	162	28	5	1
Future Volume (vph)	10	412	77	331	688	34	97	4	162	28	5	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.6	3.6	3.0	3.6			3.5	3.5		3.7	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00			1.00	0.98		1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00			0.99	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	0.99			1.00	0.85		1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00		0.96	
Satd. Flow (prot)	1770	3610	1573	1900	3584			1784	1589		1811	
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.76	1.00		0.75	
Satd. Flow (perm)	1770	3610	1573	1805	3584			1417	1589		1424	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	448	84	360	748	37	105	4	176	30	5	1
RTOR Reduction (vph)	0	0	33	0	2	0	0	0	150	0	1	0
Lane Group Flow (vph)	11	448	51	360	783	0	0	109	26	0	35	0
Confl. Peds. (#/hr)			4				7		4	4		7
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2				8		8	4		
Actuated Green, G (s)	1.2	47.5	47.5	27.4	73.7			15.0	15.0		14.8	
Effective Green, g (s)	1.2	47.5	47.5	27.4	73.7			15.0	15.0		14.8	
Actuated g/C Ratio	0.01	0.48	0.48	0.27	0.74			0.15	0.15		0.15	
Clearance Time (s)	3.0	3.6	3.6	3.0	3.6			3.5	3.5		3.7	
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0			2.0	2.0		2.0	
Lane Grp Cap (vph)	21	1714	747	520	2641			212	238		210	
v/s Ratio Prot	c0.01	0.12		c0.19	c0.22							
v/s Ratio Perm			0.03					c0.08	0.02		0.02	
v/c Ratio	0.52	0.26	0.07	0.69	0.30			0.51	0.11		0.17	
Uniform Delay, d1	49.1	15.7	14.2	32.5	4.4			39.1	36.7		37.2	
Progression Factor	1.00	1.00	1.00	0.70	0.73			1.00	1.00		1.00	
Incremental Delay, d2	10.4	0.4	0.2	3.0	0.3			0.9	0.1		0.1	
Delay (s)	59.5	16.1	14.4	25.6	3.5			40.0	36.8		37.4	
Level of Service	E	B	B	C	A			D	D		D	
Approach Delay (s)		16.7			10.4			38.0			37.4	
Approach LOS		B			B			D			D	

Intersection Summary				
HCM 2000 Control Delay	16.5	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.45			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.3	
Intersection Capacity Utilization	68.0%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
32: US 101 SB Off Ramp/Enfrente Rd & Ignacio Blvd/Ignacio Blvd #3 02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	379	244	553	771	138	0	0	504	183	88	293
Future Volume (vph)	33	379	244	553	771	138	0	0	504	183	88	293
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			2%			0%	
Total Lost time (s)	3.0	8.0	8.0	4.0	5.0				4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95				0.88		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.96	1.00	0.99				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	1.00	0.85	1.00	0.98				0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00				1.00		0.97	1.00
Satd. Flow (prot)	1805	3610	1550	1787	3499				2814		1809	1578
Flt Permitted	0.95	1.00	1.00	0.95	1.00				1.00		0.97	1.00
Satd. Flow (perm)	1805	3610	1550	1787	3499				2814		1809	1578
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)	34	395	254	576	803	144	0	0	525	191	92	305
RTOR Reduction (vph)	0	0	184	0	10	0	0	0	340	0	0	240
Lane Group Flow (vph)	34	395	70	576	937	0	0	0	185	0	283	65
Confl. Peds. (#/hr)			7			20						1
Confl. Bikes (#/hr)						3						
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	5%	1%
Turn Type	Prot	NA	Perm	Prot	NA				Over	Split	NA	Perm
Protected Phases	5	2		1	6				1	7	7	
Permitted Phases			2									7
Actuated Green, G (s)	6.6	27.4	27.4	35.2	60.0				35.2		21.4	21.4
Effective Green, g (s)	6.6	27.4	27.4	35.2	60.0				35.2		21.4	21.4
Actuated g/C Ratio	0.07	0.27	0.27	0.35	0.60				0.35		0.21	0.21
Clearance Time (s)	3.0	8.0	8.0	4.0	5.0				4.0		4.0	4.0
Vehicle Extension (s)	2.0	2.5	2.5	3.0	4.0				3.0		2.5	2.5
Lane Grp Cap (vph)	119	989	424	629	2099				990		387	337
v/s Ratio Prot	0.02	c0.11		c0.32	c0.27				0.07		c0.16	
v/s Ratio Perm			0.04									0.04
v/c Ratio	0.29	0.40	0.16	0.92	0.45				0.19		0.73	0.19
Uniform Delay, d1	44.5	29.6	27.6	31.0	10.9				22.5		36.6	32.2
Progression Factor	0.98	0.66	0.29	0.79	0.74				1.00		1.00	1.00
Incremental Delay, d2	0.5	1.2	0.8	14.4	0.5				0.1		6.6	0.2
Delay (s)	43.8	20.8	8.9	38.9	8.6				22.6		43.2	32.4
Level of Service	D	C	A	D	A				C		D	C
Approach Delay (s)		17.5			20.1			22.6			37.6	
Approach LOS		B			C			C			D	

Intersection Summary				
HCM 2000 Control Delay	23.0	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.73			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	74.9%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
33: Nave Dr & Ignacio Blvd #3/Bel Marin Keys Blvd #3 02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	274	796	112	649	526	800	513	245	0	0	0
Future Volume (vph)	0	274	796	112	649	526	800	513	245	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.6	3.0	4.0		4.6	4.6	3.0			
Lane Util. Factor		0.95	1.00	1.00	0.95		0.91	0.91	1.00			
Frpb, ped/bikes		1.00	0.99	1.00	0.99		1.00	1.00	0.99			
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00			
Frt		1.00	0.85	1.00	0.93		1.00	1.00	0.85			
Flt Protected		1.00	1.00	0.95	1.00		0.95	0.98	1.00			
Satd. Flow (prot)		3610	1604	1805	3318		1643	3368	1600			
Flt Permitted		1.00	1.00	0.95	1.00		0.95	0.98	1.00			
Satd. Flow (perm)		3610	1604	1805	3318		1643	3368	1600			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	288	838	118	683	554	842	540	258	0	0	0
RTOR Reduction (vph)	0	0	88	0	88	0	0	0	133	0	0	0
Lane Group Flow (vph)	0	288	750	118	1149	0	455	927	125	0	0	0
Confl. Peds. (#/hr)			1			1			1			
Heavy Vehicles (%)	0%	0%	0%	0%	0%	2%	0%	1%	0%	0%	0%	0%
Turn Type		NA	pm+ov	Prot	NA		Split	NA	pm+ov			
Protected Phases		2	3	1	6		3	3	1			
Permitted Phases			2						3			
Actuated Green, G (s)		39.8	75.9	12.5	55.3		36.1	36.1	48.6			
Effective Green, g (s)		39.8	75.9	12.5	55.3		36.1	36.1	48.6			
Actuated g/C Ratio		0.40	0.76	0.12	0.55		0.36	0.36	0.49			
Clearance Time (s)		4.0	4.6	3.0	4.0		4.6	4.6	3.0			
Vehicle Extension (s)		4.0	2.0	2.0	4.0		2.0	2.0	2.0			
Lane Grp Cap (vph)		1436	1217	225	1834		593	1215	777			
v/s Ratio Prot		0.08	0.22	0.07	c0.35		c0.28	0.28	0.02			
v/s Ratio Perm			0.25						0.06			
v/c Ratio		0.20	0.62	0.52	0.63		0.77	0.76	0.16			
Uniform Delay, d1		19.7	5.5	41.0	15.3		28.2	28.2	14.3			
Progression Factor		1.08	1.31	1.00	1.00		1.00	1.00	1.00			
Incremental Delay, d2		0.3	0.6	1.0	1.6		5.3	2.6	0.0			
Delay (s)		21.5	7.7	42.0	16.9		33.6	30.8	14.4			
Level of Service		C	A	D	B		C	C	B			
Approach Delay (s)		11.3			19.1			29.0			0.0	
Approach LOS		B			B			C			A	

Intersection Summary				
HCM 2000 Control Delay	20.9	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.70			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.6	
Intersection Capacity Utilization	68.0%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
34: Bel Marin Keys Blvd #3 & Commercial Blvd 02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	0	38	278	1	28	46	427	78	31	1076	7
Future Volume (vph)	3	0	38	278	1	28	46	427	78	31	1076	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	3.0	3.9		3.0	3.5	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			1.00	0.99	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.87			1.00	0.85	1.00	0.98		1.00	1.00	
Flt Protected		1.00			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1631			1807	1396	1805	3512		1805	3571	
Flt Permitted		0.98			0.69	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1608			1313	1396	1805	3512		1805	3571	
Peak-hour factor, PHF	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Adj. Flow (vph)	3	0	44	320	1	32	53	491	90	36	1237	8
RTOR Reduction (vph)	0	33	0	0	0	22	0	15	0	0	0	0
Lane Group Flow (vph)	0	14	0	0	321	10	53	566	0	36	1245	0
Confl. Peds. (#/hr)	3		2	2		3			3			
Heavy Vehicles (%)	2%	0%	0%	0%	0%	14%	0%	0%	0%	0%	1%	0%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		22.6			22.6	22.6	4.0	37.9		3.6	37.9	
Effective Green, g (s)		22.6			22.6	22.6	4.0	37.9		3.6	37.9	
Actuated g/C Ratio		0.30			0.30	0.30	0.05	0.51		0.05	0.51	
Clearance Time (s)		4.0			4.0	4.0	3.0	3.9		3.0	3.5	
Vehicle Extension (s)		3.0			3.0	3.0	2.5	3.0		2.5	4.0	
Lane Grp Cap (vph)		484			395	420	96	1774		86	1804	
v/s Ratio Prot							c0.03	0.16		0.02	c0.35	
v/s Ratio Perm		0.01			c0.24	0.01						
v/c Ratio		0.03			0.81	0.02	0.55	0.32		0.42	0.69	
Uniform Delay, d1		18.5			24.2	18.4	34.6	10.9		34.7	14.1	
Progression Factor		1.00			1.00	1.00	1.00	1.00		0.89	0.79	
Incremental Delay, d2		0.0			12.0	0.0	5.4	0.5		1.9	1.8	
Delay (s)		18.5			36.3	18.5	40.0	11.4		32.7	12.9	
Level of Service		B			D	B	D	B		C	B	
Approach Delay (s)		18.5			34.7			13.8			13.5	
Approach LOS		B			C			B			B	

Intersection Summary				
HCM 2000 Control Delay	16.9	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.73			
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	10.9	
Intersection Capacity Utilization	67.1%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
35: Bel Marin Keys Blvd #3 & Hamilton Dr/Digital Dr 02/15/2018

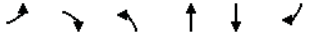
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	7	154	482	4	13	45	295	102	6	484	2
Future Volume (vph)	5	7	154	482	4	13	45	295	102	6	484	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	3.5	3.5	3.5		3.0	4.0		3.0	4.0	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.99	1.00	0.99		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	0.85	1.00	0.88		1.00	0.96		1.00	1.00	
Flt Protected		0.98	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1859	1533	1804	1658		1770	3450		1805	3572	
Flt Permitted		0.95	1.00	0.75	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1808	1533	1421	1658		1770	3450		1805	3572	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	6	8	173	542	4	15	51	331	115	7	544	2
RTOR Reduction (vph)	0	0	104	0	9	0	0	39	0	0	1	0
Lane Group Flow (vph)	0	14	69	542	10	0	51	407	0	7	545	0
Confl. Peds. (#/hr)	1		1	1		1			2			8
Heavy Vehicles (%)	0%	0%	4%	0%	0%	0%	2%	0%	0%	0%	1%	0%
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8								
Actuated Green, G (s)		29.9	29.9	29.9	29.9		5.4	32.8		1.8	29.2	
Effective Green, g (s)		29.9	29.9	29.9	29.9		5.4	32.8		1.8	29.2	
Actuated g/C Ratio		0.40	0.40	0.40	0.40		0.07	0.44		0.02	0.39	
Clearance Time (s)		3.5	3.5	3.5	3.5		3.0	4.0		3.0	4.0	
Vehicle Extension (s)		2.0	2.0	2.5	2.5		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)		720	611	566	660		127	1508		43	1390	
v/s Ratio Prot					0.01		c0.03	0.12		0.00	c0.15	
v/s Ratio Perm		0.01	0.04	c0.38								
v/c Ratio		0.02	0.11	0.96	0.02		0.40	0.27		0.16	0.39	
Uniform Delay, d1		13.7	14.2	21.9	13.6		33.3	13.5		35.9	16.5	
Progression Factor		1.00	1.00	1.00	1.00		1.37	0.44		1.00	1.00	
Incremental Delay, d2		0.0	0.0	27.2	0.0		0.7	0.4		0.7	0.8	
Delay (s)		13.7	14.2	49.2	13.6		46.4	6.4		36.5	17.3	
Level of Service		B	B	D	B		D	A		D	B	
Approach Delay (s)		14.2			48.0			10.5			17.6	
Approach LOS		B			D			B			B	

Intersection Summary				
HCM 2000 Control Delay	24.8	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.65			
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	10.5	
Intersection Capacity Utilization	71.7%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
36: Nave Dr & US 101 NB Off Ramp

02/15/2018



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	680	205	0	886	662	234
Future Volume (vph)	680	205	0	886	662	234
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		5.0	5.0	
Lane Util. Factor	0.97	1.00		0.95	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	0.96	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3467	1563		3574	3443	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3467	1563		3574	3443	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	694	209	0	904	676	239
RTOR Reduction (vph)	0	81	0	0	51	0
Lane Group Flow (vph)	694	128	0	904	864	0
Confl. Peds. (#/hr)		1				
Heavy Vehicles (%)	1%	2%	0%	1%	1%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	31.0	31.0		31.0	31.0	
Effective Green, g (s)	31.0	31.0		31.0	31.0	
Actuated g/C Ratio	0.44	0.44		0.44	0.44	
Clearance Time (s)	3.0	3.0		5.0	5.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	1535	692		1582	1524	
v/s Ratio Prot	c0.20			c0.25	0.25	
v/s Ratio Perm		0.08				
v/c Ratio	0.45	0.18		0.57	0.57	
Uniform Delay, d1	13.6	11.8		14.5	14.5	
Progression Factor	1.00	1.00		0.54	1.00	
Incremental Delay, d2	1.0	0.6		1.4	1.5	
Delay (s)	14.5	12.4		9.3	16.0	
Level of Service	B	B		A	B	
Approach Delay (s)	14.1			9.3	16.0	
Approach LOS	B			A	B	

Intersection Summary				
HCM 2000 Control Delay	13.1	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.51			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	55.8%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
37: Nave Dr & Hamilton Center

02/15/2018

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	114	43	610	127	140	525
Future Volume (vph)	114	43	610	127	140	525
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.2	3.2	4.4		3.0	4.4
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.98		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	1615	1848		1770	1881
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1805	1615	1848		1770	1881
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	119	45	635	132	146	547
RTOR Reduction (vph)	0	41	9	0	0	0
Lane Group Flow (vph)	119	4	758	0	146	547
Confl. Peds. (#/hr)				2		
Heavy Vehicles (%)	0%	0%	0%	0%	2%	1%
Turn Type	Prot	Perm	NA		Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8				
Actuated Green, G (s)	6.4	6.4	45.0		8.0	56.0
Effective Green, g (s)	6.4	6.4	45.0		8.0	56.0
Actuated g/C Ratio	0.09	0.09	0.64		0.11	0.80
Clearance Time (s)	3.2	3.2	4.4		3.0	4.4
Vehicle Extension (s)	1.0	1.0	1.0		1.0	1.0
Lane Grp Cap (vph)	165	147	1188		202	1504
v/s Ratio Prot	c0.07		c0.41		c0.08	0.29
v/s Ratio Perm		0.00				
v/c Ratio	0.72	0.03	0.64		0.72	0.36
Uniform Delay, d1	30.9	29.0	7.6		29.9	2.0
Progression Factor	1.00	1.00	0.74		0.90	0.66
Incremental Delay, d2	12.3	0.0	2.5		9.1	0.6
Delay (s)	43.3	29.0	8.1		36.1	1.9
Level of Service	D	C	A		D	A
Approach Delay (s)	39.4		8.1			9.1
Approach LOS	D		A			A

Intersection Summary				
HCM 2000 Control Delay	11.7	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.66			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	10.6	
Intersection Capacity Utilization	64.3%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
38: Nave Dr & Hamilton Pkwy

02/15/2018

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	78	299	319	45	260	244
Future Volume (vph)	78	299	319	45	260	244
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.2	3.2	4.4	4.4	3.0	4.4
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1599	1900	1578	1787	1850
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1599	1900	1578	1787	1900
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	86	329	351	49	286	268
RTOR Reduction (vph)	0	289	0	18	0	0
Lane Group Flow (vph)	86	40	351	31	286	268
Confl. Peds. (#/hr)				2		
Heavy Vehicles (%)	2%	1%	0%	0%	1%	0%
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Actuated Green, G (s)	8.6	8.6	32.6	32.6	18.2	53.8
Effective Green, g (s)	8.6	8.6	32.6	32.6	18.2	53.8
Actuated g/C Ratio	0.12	0.12	0.47	0.47	0.26	0.77
Clearance Time (s)	3.2	3.2	4.4	4.4	3.0	4.4
Vehicle Extension (s)	2.0	2.0	3.0	3.0	2.0	3.0
Lane Grp Cap (vph)	217	196	884	734	464	1421
v/s Ratio Prot	c0.05		c0.18		c0.16	0.14
v/s Ratio Perm		0.03		0.02		
v/c Ratio	0.40	0.21	0.40	0.04	0.62	0.19
Uniform Delay, d1	28.3	27.6	12.3	10.2	22.8	2.2
Progression Factor	1.00	1.00	1.00	1.00	0.87	0.29
Incremental Delay, d2	0.4	0.2	1.3	0.1	1.6	0.3
Delay (s)	28.7	27.8	13.6	10.3	21.5	0.9
Level of Service	C	C	B	B	C	A
Approach Delay (s)	28.0		13.2			11.5
Approach LOS	C		B			B

Intersection Summary				
HCM 2000 Control Delay	17.0	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.46			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	10.6	
Intersection Capacity Utilization	50.6%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
39: Nave Dr & Main Gate Dr

02/15/2018

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	219	87	263	205	96	241
Future Volume (vph)	219	87	263	205	96	241
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	4.1	4.1	3.0	4.4
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1805	1615	1900	1615	1805	1881
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1805	1615	1900	1615	1805	1881
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	241	96	289	225	105	265
RTOR Reduction (vph)	0	75	0	143	0	0
Lane Group Flow (vph)	241	21	289	82	105	265
Heavy Vehicles (%)	0%	0%	0%	0%	0%	1%
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Actuated Green, G (s)	8.2	8.2	13.8	13.8	5.6	22.1
Effective Green, g (s)	8.2	8.2	13.8	13.8	5.6	22.1
Actuated g/C Ratio	0.22	0.22	0.37	0.37	0.15	0.59
Clearance Time (s)	3.0	3.0	4.1	4.1	3.0	4.4
Vehicle Extension (s)	2.0	2.0	1.0	1.0	1.0	1.0
Lane Grp Cap (vph)	392	351	695	591	268	1102
v/s Ratio Prot	c0.13		c0.15		c0.06	0.14
v/s Ratio Perm		0.01		0.05		
v/c Ratio	0.61	0.06	0.42	0.14	0.39	0.24
Uniform Delay, d1	13.3	11.7	8.9	8.0	14.5	3.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.0	0.0	0.1	0.0	0.3	0.0
Delay (s)	15.3	11.7	9.1	8.0	14.9	3.8
Level of Service	B	B	A	A	B	A
Approach Delay (s)	14.3		8.6			6.9
Approach LOS	B		A			A

Intersection Summary				
HCM 2000 Control Delay	9.7	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.47			
Actuated Cycle Length (s)	37.7	Sum of lost time (s)	10.1	
Intersection Capacity Utilization	46.1%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
40: Nave Dr & Bolling Dr 02/15/2018

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	194	43	438	323	82	423
Future Volume (vph)	194	43	438	323	82	423
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	4.1		3.0	3.5
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	0.97	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.94		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1787	1571	1781		1805	1881
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1787	1571	1781		1805	1881
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	202	45	456	336	85	441
RTOR Reduction (vph)	0	35	31	0	0	0
Lane Group Flow (vph)	202	10	761	0	85	441
Confl. Peds. (#/hr)		6				
Heavy Vehicles (%)	1%	0%	1%	0%	0%	1%
Turn Type	Prot	Perm	NA		Prot	NA
Protected Phases	4		6		5	2
Permitted Phases		4				
Actuated Green, G (s)	13.8	13.8	31.0		6.5	41.1
Effective Green, g (s)	13.8	13.8	31.0		6.5	41.1
Actuated g/C Ratio	0.22	0.22	0.50		0.11	0.67
Clearance Time (s)	3.0	3.0	4.1		3.0	3.5
Vehicle Extension (s)	2.0	2.0	2.0		2.0	2.0
Lane Grp Cap (vph)	401	353	899		191	1259
v/s Ratio Prot	c0.11		c0.43		c0.05	0.23
v/s Ratio Perm		0.01				
v/c Ratio	0.50	0.03	0.85		0.45	0.35
Uniform Delay, d1	20.8	18.6	13.1		25.8	4.4
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.4	0.0	7.1		0.6	0.1
Delay (s)	21.2	18.6	20.3		26.4	4.4
Level of Service	C	B	C		C	A
Approach Delay (s)	20.7		20.3			8.0
Approach LOS	C		C			A

Intersection Summary			
HCM 2000 Control Delay	16.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	61.4	Sum of lost time (s)	10.1
Intersection Capacity Utilization	72.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM 2010 AWSC
41: Alameda Del Prado & Clay Ct/Nave Dr 02/15/2018

Intersection	
Intersection Delay, s/veh	14.8
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	8	10	1	102	20	683	0	67	37	180	68	12
Future Vol, veh/h	8	10	1	102	20	683	0	67	37	180	68	12
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	10	1	105	21	704	0	69	38	186	70	12
Number of Lanes	0	1	0	0	1	1	0	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	2	1
HCM Control Delay	10.1	15.9	11.2	13
HCM LOS	B	C	B	B

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	0%	42%	25%	0%	100%	0%
Vol Thru, %	64%	53%	5%	0%	0%	85%
Vol Right, %	36%	5%	70%	100%	0%	15%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	104	19	409	396	180	80
LT Vol	0	8	102	0	180	0
Through Vol	67	10	20	0	0	68
RT Vol	37	1	287	396	0	12
Lane Flow Rate	107	20	422	408	186	82
Geometry Grp	6	6	7	7	7	7
Degree of Util (X)	0.196	0.037	0.636	0.578	0.37	0.15
Departure Headway (Hd)	6.579	6.806	5.434	5.098	7.183	6.569
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	546	526	666	707	501	546
Service Time	4.615	4.854	3.164	2.827	4.919	4.305
HCM Lane V/C Ratio	0.196	0.038	0.634	0.577	0.371	0.15
HCM Control Delay	11.2	10.1	17.2	14.6	14.1	10.5
HCM Lane LOS	B	B	C	B	B	B
HCM 95th-tile Q	0.7	0.1	4.6	3.7	1.7	0.5

HCM 2010 AWSC
1: Simmons Ln & San Marin Dr 02/15/2018

Intersection	
Intersection Delay, s/veh	46.9
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	15	531	129	191	458	9	113	12	315	29	13	15
Future Vol, veh/h	15	531	129	191	458	9	113	12	315	29	13	15
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	16	571	139	205	492	10	122	13	339	31	14	16
Number of Lanes	1	2	0	1	2	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	3	3
HCM Control Delay	63.1	35.1	43.6	17.5
HCM LOS	F	E	E	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1
Vol Left, %	90%	0%	100%	0%	0%	100%	0%	0%	51%
Vol Thru, %	10%	0%	0%	100%	58%	0%	100%	94%	23%
Vol Right, %	0%	100%	0%	0%	42%	0%	0%	6%	26%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	125	315	15	354	306	191	305	162	57
LT Vol	113	0	15	0	0	191	0	0	29
Through Vol	12	0	0	354	177	0	305	153	13
RT Vol	0	315	0	0	129	0	0	9	15
Lane Flow Rate	134	339	16	381	329	205	328	174	61
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.395	0.885	0.045	1.009	0.844	0.57	0.863	0.455	0.2
Departure Headway (Hd)	10.58	9.401	10.062	9.54	9.233	9.984	9.462	9.421	11.766
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	340	386	357	381	395	364	384	384	305
Service Time	8.345	7.165	7.786	7.265	6.957	7.704	7.182	7.141	9.536
HCM Lane V/C Ratio	0.394	0.878	0.045	1	0.833	0.563	0.854	0.453	0.2
HCM Control Delay	20.1	52.9	13.3	80.2	45.8	25.2	49.4	19.8	17.5
HCM Lane LOS	C	F	B	F	E	D	E	C	C
HCM 95th-tile Q	1.8	8.8	0.1	12.1	7.9	3.4	8.3	2.3	0.7

HCM Signalized Intersection Capacity Analysis
1: Simmons Ln & San Marin Dr 02/23/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	531	129	191	458	9	113	12	315	29	13	15
Future Volume (vph)	15	531	129	191	458	9	113	12	315	29	13	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.98	
Satd. Flow (prot)	1787	1881	1599	1787	1881	1599		1800	1599		1770	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.77	1.00		0.83	
Satd. Flow (perm)	1787	1881	1599	1787	1881	1599		1445	1599		1497	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	16	571	139	205	492	10	122	13	339	31	14	16
RTOR Reduction (vph)	0	0	62	0	0	4	0	0	108	0	13	0
Lane Group Flow (vph)	16	571	77	205	492	6	0	135	231	0	48	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	pm+ov	Perm	NA	
Protected Phases	7	4		3	8			2	3		6	
Permitted Phases			4			8	2		2	6		
Actuated Green, G (s)	0.6	28.5	28.5	12.5	40.4	40.4		13.0	25.5		13.0	
Effective Green, g (s)	0.6	28.5	28.5	12.5	40.4	40.4		13.0	25.5		13.0	
Actuated g/C Ratio	0.01	0.43	0.43	0.19	0.61	0.61		0.20	0.39		0.20	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	
Lane Grp Cap (vph)	16	812	690	338	1151	978		284	714		294	
v/s Ratio Prot	0.01	c0.30		c0.11	0.26				c0.06			
v/s Ratio Perm			0.05			0.00		c0.09	0.08		0.03	
v/c Ratio	1.00	0.70	0.11	0.61	0.43	0.01		0.48	0.32		0.16	
Uniform Delay, d1	32.7	15.3	11.2	24.5	6.7	5.0		23.5	14.2		22.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2	225.0	2.8	0.1	3.1	0.3	0.0		1.3	0.3		0.3	
Delay (s)	257.7	18.1	11.3	27.6	7.0	5.0		24.7	14.5		22.3	
Level of Service	F	B	B	C	A	A		C	B		C	
Approach Delay (s)		22.1			12.9			17.4			22.3	
Approach LOS		C			B			B			C	

Intersection Summary			
HCM 2000 Control Delay	17.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	66.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	60.8%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

MOVEMENT SUMMARY

Site: 1 [AM E+P]

Simmons Lane/San Marin Drive
AM Existing plus Project
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NB Simmons Ln											
3	L2	122	2.0	0.665	17.9	LOS B	6.3	160.4	0.84	1.08	28.6
8	T1	13	2.0	0.665	17.9	LOS B	6.3	160.4	0.84	1.08	28.6
18	R2	339	2.0	0.665	17.9	LOS B	6.3	160.4	0.84	1.08	27.9
Approach		473	2.0	0.665	17.9	LOS B	6.3	160.4	0.84	1.08	28.1
East: WB San Marin Drive											
1	L2	205	2.0	0.170	4.4	LOS A	0.7	18.7	0.30	0.17	32.6
6	T1	492	2.0	0.415	7.1	LOS A	2.4	60.6	0.39	0.25	33.7
16	R2	10	2.0	0.415	7.1	LOS A	2.4	60.6	0.39	0.25	32.8
Approach		708	2.0	0.415	6.4	LOS A	2.4	60.6	0.36	0.23	33.4
North: SB Simmons Ln											
7	L2	31	2.0	0.090	6.2	LOS A	0.3	7.8	0.57	0.56	32.9
4	T1	14	2.0	0.090	6.2	LOS A	0.3	7.8	0.57	0.56	32.9
14	R2	16	2.0	0.090	6.2	LOS A	0.3	7.8	0.57	0.56	32.1
Approach		61	2.0	0.090	6.2	LOS A	0.3	7.8	0.57	0.56	32.7
West: EB San Marin Drive											
5	L2	16	2.0	0.696	14.4	LOS B	10.8	275.4	0.77	0.83	30.5
2	T1	571	2.0	0.696	14.4	LOS B	10.8	275.4	0.77	0.83	30.5
12	R2	139	2.0	0.696	14.4	LOS B	10.8	275.4	0.77	0.83	29.7
Approach		726	2.0	0.696	14.4	LOS B	10.8	275.4	0.77	0.83	30.3
All Vehicles		1968	2.0	0.696	12.1	LOS B	10.8	275.4	0.63	0.66	30.8

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Organisation: W-TRANS | Processed: Tuesday, February 27, 2018 3:47:18 PM
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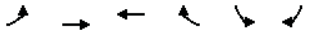
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	893	2	2	670	77	1	0	4	8	0	1
Future Volume (vph)	13	893	2	2	670	77	1	0	4	8	0	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.8		4.0	4.8	4.8		4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00		0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		0.89		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99		0.95	0.95	1.00
Satd. Flow (prot)	1805	3573		1805	3574	1615		1678		1715	1715	1615
Flt Permitted	0.95	1.00		0.95	1.00	1.00		1.00		1.00	1.00	1.00
Satd. Flow (perm)	1805	3573		1805	3574	1615		1695		1805	1805	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	14	971	2	2	728	84	1	0	4	9	0	1
RTOR Reduction (vph)	0	0	0	0	0	39	0	5	0	0	0	1
Lane Group Flow (vph)	14	973	0	2	728	45	0	0	0	4	5	0
Confl. Peds. (#/hr)			2									
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8			4		4
Actuated Green, G (s)	0.8	16.4		0.7	16.3	16.3		0.8		0.8	0.8	0.8
Effective Green, g (s)	0.8	16.4		0.7	16.3	16.3		0.8		0.8	0.8	0.8
Actuated g/C Ratio	0.03	0.53		0.02	0.53	0.53		0.03		0.03	0.03	0.03
Clearance Time (s)	4.0	4.8		4.0	4.8	4.8		4.0		4.0	4.0	4.0
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0		2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	47	1908		41	1897	857		44		47	47	42
v/s Ratio Prot	c0.01	c0.27		0.00	0.20							
v/s Ratio Perm						0.03		0.00		0.00	c0.00	0.00
v/c Ratio	0.30	0.51		0.05	0.38	0.05		0.00		0.09	0.11	0.00
Uniform Delay, d1	14.7	4.6		14.7	4.2	3.5		14.6		14.6	14.6	14.6
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	1.3	0.3		0.2	0.2	0.0		0.0		0.3	0.4	0.0
Delay (s)	16.0	4.9		14.9	4.4	3.5		14.6		14.9	15.0	14.6
Level of Service	B	A		B	A	A		B		B	B	B
Approach Delay (s)		5.0			4.4			14.6			14.9	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	4.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	30.7	Sum of lost time (s)	12.8
Intersection Capacity Utilization	45.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: San Marin Dr & E Campus Drive

02/15/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	906	747	20	11	0
Future Volume (vph)	0	906	747	20	11	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.3	4.3	4.3	3.0	
Lane Util. Factor		0.95	0.95	1.00	0.97	
Frpb, ped/bikes		1.00	1.00	1.00	1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00	
Frt		1.00	1.00	0.85	1.00	
Flt Protected		1.00	1.00	1.00	0.95	
Satd. Flow (prot)		3574	3574	1615	3502	
Flt Permitted		1.00	1.00	1.00	0.95	
Satd. Flow (perm)		3574	3574	1615	3502	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	985	812	22	12	0
RTOR Reduction (vph)	0	0	0	3	0	0
Lane Group Flow (vph)	0	985	812	19	12	0
Confl. Peds. (#/hr)						1
Heavy Vehicles (%)	0%	1%	1%	0%	0%	0%
Turn Type	Prot	NA	NA	Perm	Perm	Perm
Protected Phases	5	2	6			
Permitted Phases				6	4	4
Actuated Green, G (s)		115.1	115.1	115.1	7.6	
Effective Green, g (s)		115.1	115.1	115.1	7.6	
Actuated g/C Ratio		0.89	0.89	0.89	0.06	
Clearance Time (s)		4.3	4.3	4.3	3.0	
Vehicle Extension (s)		4.0	4.0	4.0	2.0	
Lane Grp Cap (vph)		3164	3164	1429	204	
v/s Ratio Prot		c0.28	0.23			
v/s Ratio Perm				0.01	c0.00	
v/c Ratio		0.31	0.26	0.01	0.06	
Uniform Delay, d1		1.2	1.1	0.9	57.8	
Progression Factor		1.00	0.91	1.09	1.00	
Incremental Delay, d2		0.3	0.1	0.0	0.0	
Delay (s)		1.4	1.1	0.9	57.9	
Level of Service		A	A	A	E	
Approach Delay (s)		1.4	1.1		57.9	
Approach LOS		A	A		E	

Intersection Summary				
HCM 2000 Control Delay	1.6	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.30			
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	10.3	
Intersection Capacity Utilization	37.7%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
4: Redwood Blvd & San Marin Dr

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	67	689	165	352	590	670	134	133	302	170	58	43
Future Volume (vph)	67	689	165	352	590	670	134	133	302	170	58	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.6		3.0	4.0		4.3	4.3	4.3	4.3	4.3	
Lane Util. Factor	1.00	0.91		1.00	0.91		0.97	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	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	1.00	
Frt	1.00	0.97		1.00	0.92		1.00	1.00	0.85	1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1787	4972		1752	4726		3467	1881	1568	1787	1748	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1787	4972		1752	4726		3467	1881	1568	1787	1748	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	71	725	174	371	621	705	141	140	318	179	61	45
RTOR Reduction (vph)	0	31	0	0	115	0	0	0	283	0	23	0
Lane Group Flow (vph)	71	868	0	371	1211	0	141	140	35	179	83	0
Confl. Peds. (#/hr)			4									5
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	1%	1%	1%	3%	1%	1%	1%	1%	3%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA		Split	NA	Perm	Split	NA	
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases					2				7			
Actuated Green, G (s)	8.2	44.8		36.3	72.5		14.4	14.4	14.4	19.3	19.3	
Effective Green, g (s)	8.2	44.8		36.3	72.5		14.4	14.4	14.4	19.3	19.3	
Actuated g/C Ratio	0.06	0.34		0.28	0.56		0.11	0.11	0.11	0.15	0.15	
Clearance Time (s)	3.0	3.6		3.0	4.0		4.3	4.3	4.3	4.3	4.3	
Vehicle Extension (s)	2.0	4.0		5.0	4.0		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	112	1713		489	2635		384	208	173	265	259	
v/s Ratio Prot	0.04	c0.17		c0.21	0.26		0.04	c0.07		c0.10	0.05	
v/s Ratio Perm									0.02			
v/c Ratio	0.63	0.51		0.76	0.46		0.37	0.67	0.20	0.68	0.32	
Uniform Delay, d1	59.4	33.8		42.8	17.1		53.6	55.5	52.6	52.4	49.5	
Progression Factor	1.15	0.93		1.05	1.07		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	8.1	1.0		6.6	0.5		0.2	6.6	0.2	5.3	0.3	
Delay (s)	76.7	32.5		51.6	18.8		53.8	62.1	52.8	57.7	49.7	
Level of Service	E	C		D	B		D	E	D	E	D	
Approach Delay (s)		35.8			26.0			55.2			54.7	
Approach LOS		D			C			E			D	

Intersection Summary				
HCM 2000 Control Delay	35.9	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.64			
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	15.6	
Intersection Capacity Utilization	90.9%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
4: Redwood Blvd & San Marin Dr 02/23/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	67	689	165	352	590	670	134	133	302	170	58	43
Future Volume (vph)	67	689	165	352	590	670	134	133	302	170	58	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.6		3.0	4.0	4.3	4.3	4.3	3.0	4.3	4.3	
Lane Util. Factor	1.00	0.91		0.97	0.95	1.00	0.95	0.95	0.88	0.91	0.91	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.98	
Satd. Flow (prot)	1787	4972		3400	3574	1599	1698	1779	2760	1626	3217	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.98	
Satd. Flow (perm)	1787	4972		3400	3574	1599	1698	1779	2760	1626	3217	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	71	725	174	371	621	705	141	140	318	179	61	45
RTOR Reduction (vph)	0	27	0	0	0	75	0	0	222	0	28	0
Lane Group Flow (vph)	71	872	0	371	621	630	127	154	96	97	160	0
Confl. Peds. (#/hr)			4									5
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	1%	1%	1%	3%	1%	1%	1%	1%	3%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA	pm+ov	Split	NA	
Protected Phases	5	2		1	6	4	8	8	1	4	4	
Permitted Phases						6			8			
Actuated Green, G (s)	8.0	55.1		24.0	70.7	89.7	14.7	14.7	38.7	19.0	19.0	
Effective Green, g (s)	8.0	55.1		24.0	70.7	89.7	14.7	14.7	38.7	19.0	19.0	
Actuated g/C Ratio	0.06	0.43		0.19	0.55	0.70	0.11	0.11	0.30	0.15	0.15	
Clearance Time (s)	3.0	3.6		3.0	4.0	4.3	4.3	4.3	3.0	4.3	4.3	
Vehicle Extension (s)	2.0	4.0		5.0	4.0	2.0	2.0	2.0	5.0	2.0	2.0	
Lane Grp Cap (vph)	111	2140		637	1974	1120	195	204	834	241	477	
v/s Ratio Prot	c0.04	0.18		c0.11	0.17	c0.08	0.07	c0.09	0.02	0.06	0.05	
v/s Ratio Perm						0.31			0.01			
v/c Ratio	0.64	0.41		0.58	0.31	0.56	0.65	0.75	0.12	0.40	0.34	
Uniform Delay, d1	58.6	25.2		47.4	15.5	9.5	54.2	54.9	32.3	49.4	48.8	
Progression Factor	1.00	1.00		0.79	0.63	1.46	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	8.6	0.6		1.9	0.4	0.3	5.8	13.1	0.1	0.4	0.2	
Delay (s)	67.2	25.8		39.5	10.1	14.1	60.0	68.0	32.4	49.8	49.0	
Level of Service	E	C		D	B	B	E	E	C	D	D	
Approach Delay (s)		28.8			18.2			47.4			49.3	
Approach LOS		C			B			D			D	

Intersection Summary				
HCM 2000 Control Delay	28.5	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.59			
Actuated Cycle Length (s)	128.0	Sum of lost time (s)	15.6	
Intersection Capacity Utilization	81.4%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
5: US 101 SB Ramps & San Marin Dr 02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	655	509	133	1033	0	0	0	0	92	1	579
Future Volume (vph)	0	655	509	133	1033	0	0	0	0	92	1	579
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9	4.9	3.0	5.3						4.0	4.0
Lane Util. Factor		0.95	1.00	1.00	0.95						1.00	0.88
Frpb, ped/bikes		1.00	0.99	1.00	1.00						1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		3574	1575	1805	3574						1810	2814
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		3574	1575	1805	3574						1810	2814
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)	0	697	541	141	1099	0	0	0	0	98	1	616
RTOR Reduction (vph)	0	0	275	0	0	0	0	0	0	0	0	128
Lane Group Flow (vph)	0	697	266	141	1099	0	0	0	0	0	99	488
Confl. Peds. (#/hr)			4									
Heavy Vehicles (%)	0%	1%	1%	0%	1%	0%	0%	0%	0%	0%	0%	1%
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			2									4
Actuated Green, G (s)		31.9	31.9	6.8	41.3						14.4	14.4
Effective Green, g (s)		31.9	31.9	6.8	41.3						14.4	14.4
Actuated g/C Ratio		0.49	0.49	0.10	0.64						0.22	0.22
Clearance Time (s)		4.9	4.9	3.0	5.3						4.0	4.0
Vehicle Extension (s)		4.0	4.0	2.0	4.0						2.0	2.0
Lane Grp Cap (vph)		1754	772	188	2270						400	623
v/s Ratio Prot		0.20		c0.08	c0.31						0.05	
v/s Ratio Perm			0.17									c0.17
v/c Ratio		0.40	0.34	0.75	0.48						0.25	0.78
Uniform Delay, d1		10.5	10.1	28.3	6.2						20.8	23.8
Progression Factor		0.46	1.63	1.00	1.00						1.00	1.00
Incremental Delay, d2		0.6	1.1	13.8	0.7						0.1	5.9
Delay (s)		5.4	17.6	42.1	7.0						21.0	29.7
Level of Service		A	B	D	A						C	C
Approach Delay (s)		10.7			11.0			0.0			28.5	
Approach LOS		B			B			A			C	

Intersection Summary				
HCM 2000 Control Delay	14.8	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.62			
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	11.9	
Intersection Capacity Utilization	58.4%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
6: US 101 NB Ramps & San Marin Dr

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	380	364	0	0	491	86	669	0	153	0	0	0
Future Volume (vph)	380	364	0	0	491	86	669	0	153	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.6			4.9	4.9	3.5	3.5				
Lane Util. Factor	0.97	1.00			0.95	1.00	0.95	0.95				
Frpb, ped/bikes	1.00	1.00			1.00	0.99	1.00	0.99				
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00				
Frt	1.00	1.00			1.00	0.85	1.00	0.94				
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.97				
Satd. Flow (prot)	3467	1881			3574	1594	1681	1599				
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.97				
Satd. Flow (perm)	3467	1881			3574	1594	1681	1599				
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	400	383	0	0	517	91	704	0	161	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	68	0	60	0	0	0	0
Lane Group Flow (vph)	400	383	0	0	517	23	444	361	0	0	0	0
Confl. Peds. (#/hr)			3			1			1	1		
Heavy Vehicles (%)	1%	1%	0%	0%	1%	0%	2%	0%	3%	0%	0%	0%
Turn Type	Prot	NA			NA	Perm	Split	NA				
Protected Phases	5	2			6		8	8				
Permitted Phases						6						
Actuated Green, G (s)	10.2	27.7			13.7	13.7	18.9	18.9				
Effective Green, g (s)	10.2	27.7			13.7	13.7	18.9	18.9				
Actuated g/C Ratio	0.19	0.51			0.25	0.25	0.35	0.35				
Clearance Time (s)	3.5	4.6			4.9	4.9	3.5	3.5				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	2.5	2.5				
Lane Grp Cap (vph)	646	952			895	399	580	552				
v/s Ratio Prot	c0.12	0.20			c0.14		c0.26	0.23				
v/s Ratio Perm						0.01						
v/c Ratio	0.62	0.40			0.58	0.06	0.77	0.65				
Uniform Delay, d1	20.5	8.4			18.0	15.6	15.9	15.1				
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00				
Incremental Delay, d2	1.3	0.4			1.1	0.1	5.7	2.5				
Delay (s)	21.7	8.7			19.1	15.7	21.7	17.6				
Level of Service	C	A			B	B	C	B				
Approach Delay (s)		15.4			18.5			19.7			0.0	
Approach LOS		B			B			B			A	

Intersection Summary				
HCM 2000 Control Delay	17.9	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.67			
Actuated Cycle Length (s)	54.7	Sum of lost time (s)	11.9	
Intersection Capacity Utilization	58.4%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
7: Redwood Blvd & Olive St

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	102	95	35	144	126	107	17	408	133	149	390	77
Future Volume (vph)	102	95	35	144	126	107	17	408	133	149	390	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.1	5.1			5.1		4.0	3.9	3.9	4.0	3.9	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.96			0.96		1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00			0.98		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1787			1758		1770	3539	1583	1770	3451	
Flt Permitted	0.95	1.00			0.98		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1787			1758		1770	3539	1583	1770	3451	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	111	103	38	157	137	116	18	443	145	162	424	84
RTOR Reduction (vph)	0	14	0	0	12	0	0	0	108	0	14	0
Lane Group Flow (vph)	111	127	0	0	398	0	18	443	37	162	494	0
Turn Type	Split	NA		Split	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	11.6	11.6			24.7		1.5	18.0	18.0	11.6	28.1	
Effective Green, g (s)	11.6	11.6			24.7		1.5	18.0	18.0	11.6	28.1	
Actuated g/C Ratio	0.14	0.14			0.29		0.02	0.21	0.21	0.14	0.33	
Clearance Time (s)	5.1	5.1			5.1		4.0	3.9	3.9	4.0	3.9	
Vehicle Extension (s)	1.0	1.0			1.0		1.0	1.0	1.0	1.0	1.0	
Lane Grp Cap (vph)	244	246			516		31	758	339	244	1154	
v/s Ratio Prot	0.06	c0.07			c0.23		0.01	c0.13		c0.09	0.14	
v/s Ratio Perm									0.02			
v/c Ratio	0.45	0.52			0.77		0.58	0.58	0.11	0.66	0.43	
Uniform Delay, d1	33.3	33.6			27.1		40.9	29.6	26.6	34.4	21.7	
Progression Factor	1.00	1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.5	0.8			6.4		16.6	0.7	0.1	5.2	0.1	
Delay (s)	33.8	34.4			33.5		57.5	30.4	26.6	39.5	21.8	
Level of Service	C	C			C		E	C	C	D	C	
Approach Delay (s)		34.1			33.5			30.3			26.1	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM 2000 Control Delay	30.0	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.66			
Actuated Cycle Length (s)	84.0	Sum of lost time (s)	18.1	
Intersection Capacity Utilization	65.0%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
8: Redwood Blvd & Grant Ave

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	84	99	202	24	76	40	215	365	46	34	429	77
Future Volume (vph)	84	99	202	24	76	40	215	365	46	34	429	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5		3.5	3.7	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	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		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1763	1900	1564	1803	1900	1588	1805	3472		1805	3447	
Flt Permitted	0.70	1.00	1.00	0.69	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1303	1900	1564	1304	1900	1588	1805	3472		1805	3447	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	92	109	222	26	84	44	236	401	51	37	471	85
RTOR Reduction (vph)	0	0	162	0	0	32	0	7	0	0	14	0
Lane Group Flow (vph)	92	109	60	26	84	12	236	445	0	37	542	0
Confl. Peds. (#/hr)	9		11	2		1			10			9
Confl. Bikes (#/hr)			5			5			5			5
Heavy Vehicles (%)	2%	0%	1%	0%	0%	0%	0%	2%	0%	0%	2%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8		8	4		4						
Actuated Green, G (s)	17.4	17.4	17.4	17.4	17.4	17.4	15.5	32.7		3.2	20.2	
Effective Green, g (s)	17.4	17.4	17.4	17.4	17.4	17.4	15.5	32.7		3.2	20.2	
Actuated g/C Ratio	0.27	0.27	0.27	0.27	0.27	0.27	0.24	0.51		0.05	0.31	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5		3.5	3.7	
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0	4.0	2.5	3.0		2.5	3.0	
Lane Grp Cap (vph)	352	514	423	352	514	429	435	1765		89	1082	
v/s Ratio Prot		0.06			0.04		c0.13	0.13		0.02	c0.16	
v/s Ratio Perm	c0.07		0.04	0.02		0.01						
v/c Ratio	0.26	0.21	0.14	0.07	0.16	0.03	0.54	0.25		0.42	0.50	
Uniform Delay, d1	18.4	18.1	17.8	17.5	17.9	17.2	21.3	8.9		29.6	17.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.3	0.2	0.1	0.2	0.0	1.1	0.1		2.3	0.4	
Delay (s)	18.9	18.4	18.0	17.6	18.1	17.3	22.4	9.0		31.9	18.3	
Level of Service	B	B	B	B	B	B	C	A		C	B	
Approach Delay (s)		18.3			17.8			13.6			19.2	
Approach LOS		B			B			B			B	

Intersection Summary				
HCM 2000 Control Delay	16.8	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.43			
Actuated Cycle Length (s)	64.3	Sum of lost time (s)	11.2	
Intersection Capacity Utilization	54.8%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM 2010 AWSC
9: San Marin Dr/Sutro Ave & Novato Blvd

02/15/2018

Intersection	
Intersection Delay, s/veh	41.3
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	62	153	60	20	178	170	111	160	50	194	95	97
Future Vol, veh/h	62	153	60	20	178	170	111	160	50	194	95	97
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	73	180	71	24	209	200	131	188	59	228	112	114
Number of Lanes	1	1	0	1	1	0	1	1	0	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	3	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	3	2	2
HCM Control Delay	27.1	84.8	25.8	22.8
HCM LOS	D	F	D	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%	0%
Vol Thru, %	0%	76%	0%	72%	0%	51%	0%	100%	0%
Vol Right, %	0%	24%	0%	28%	0%	49%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	111	210	62	213	20	348	194	95	97
LT Vol	111	0	62	0	20	0	194	0	0
Through Vol	0	160	0	153	0	178	0	95	0
RT Vol	0	50	0	60	0	170	0	0	97
Lane Flow Rate	131	247	73	251	24	409	228	112	114
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.371	0.654	0.209	0.667	0.066	1.046	0.636	0.295	0.279
Departure Headway (Hd)	10.544	9.843	10.622	9.895	10.072	9.2	10.347	9.824	9.093
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	343	371	340	368	358	397	351	368	397
Service Time	8.244	7.543	8.322	7.595	7.772	6.9	8.047	7.524	6.793
HCM Lane V/C Ratio	0.382	0.666	0.215	0.682	0.067	1.03	0.65	0.304	0.287
HCM Control Delay	19.3	29.3	16.1	30.3	13.5	88.9	29.5	16.6	15.3
HCM Lane LOS	C	D	C	D	B	F	D	C	C
HCM 95th-tile Q	1.7	4.4	0.8	4.6	0.2	13.6	4.2	1.2	1.1

HCM Signalized Intersection Capacity Analysis
9: San Marin Dr/Sutro Ave & Novato Blvd #1 02/23/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	62	153	60	20	178	170	111	160	50	194	95	97
Future Volume (vph)	62	153	60	20	178	170	111	160	50	194	95	97
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.93		1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1784		1770	1726		1770	1797		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	1784		1770	1726		1770	1797		1770	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	67	166	65	22	193	185	121	174	54	211	103	105
RTOR Reduction (vph)	0	15	0	0	38	0	0	13	0	0	0	72
Lane Group Flow (vph)	67	216	0	22	340	0	121	215	0	211	103	33
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	4.5	21.9		1.5	18.9		7.8	15.5		13.3	21.0	21.0
Effective Green, g (s)	4.5	21.9		1.5	18.9		7.8	15.5		13.3	21.0	21.0
Actuated g/C Ratio	0.07	0.33		0.02	0.29		0.12	0.23		0.20	0.32	0.32
Clearance Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	120	590		40	492		208	420		355	590	502
v/s Ratio Prot	c0.04	c0.12		0.01	c0.20		0.07	c0.12		c0.12	0.06	
v/s Ratio Perm												0.02
v/c Ratio	0.56	0.37		0.55	0.69		0.58	0.51		0.59	0.17	0.07
Uniform Delay, d1	29.9	16.9		32.0	21.1		27.7	22.1		24.0	16.3	15.8
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	5.5	0.4		15.3	4.2		4.1	1.1		2.7	0.1	0.1
Delay (s)	35.4	17.2		47.4	25.2		31.8	23.1		26.7	16.5	15.8
Level of Service	D	B		D	C		C	C		C	B	B
Approach Delay (s)		21.3			26.4			26.1			21.4	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM 2000 Control Delay	23.9	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.58			
Actuated Cycle Length (s)	66.2	Sum of lost time (s)	14.0	
Intersection Capacity Utilization	58.7%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

MOVEMENT SUMMARY

Site: 9 [AM Existing + Project]

Novato Boulevard/San Marin Dr-Sutro Ave
AM Existing + Project

Roundabout

Movement Performance - Vehicles

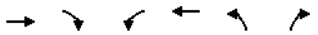
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NB Sutro Ave											
3	L2	121	2.0	0.410	9.2	LOS A	2.2	57.0	0.64	0.63	32.0
8	T1	174	2.0	0.410	9.2	LOS A	2.2	57.0	0.64	0.63	32.0
18	R2	54	2.0	0.410	9.2	LOS A	2.2	57.0	0.64	0.63	31.2
Approach		349	2.0	0.410	9.2	LOS A	2.2	57.0	0.64	0.63	31.9
East: WB Novato Blvd											
1	L2	22	2.0	0.431	8.9	LOS A	2.4	60.5	0.61	0.55	32.8
6	T1	193	2.0	0.431	8.9	LOS A	2.4	60.5	0.61	0.55	32.8
16	R2	185	2.0	0.431	8.9	LOS A	2.4	60.5	0.61	0.55	31.9
Approach		400	2.0	0.431	8.9	LOS A	2.4	60.5	0.61	0.55	32.4
North: SB San Marin Drive											
7	L2	211	2.0	0.308	6.6	LOS A	1.4	36.6	0.50	0.41	32.4
4	T1	103	2.0	0.308	6.6	LOS A	1.4	36.6	0.50	0.41	32.4
14	R2	105	2.0	0.103	4.5	LOS A	0.4	10.3	0.42	0.31	34.1
Approach		420	2.0	0.308	6.1	LOS A	1.4	36.6	0.48	0.38	32.8
West: EB Novato Blvd											
5	L2	67	2.0	0.313	7.1	LOS A	1.6	39.7	0.54	0.45	33.3
2	T1	166	2.0	0.313	7.1	LOS A	1.6	39.7	0.54	0.45	33.3
12	R2	65	2.0	0.313	7.1	LOS A	1.6	39.7	0.54	0.45	32.4
Approach		299	2.0	0.313	7.1	LOS A	1.6	39.7	0.54	0.45	33.1
All Vehicles		1467	2.0	0.431	7.8	LOS A	2.4	60.5	0.57	0.50	32.5

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Organisation: W-TRANS | Processed: Tuesday, February 27, 2018 3:53:36 PM
Project: N:\AAA\MAX\NOV\126NOV\SIDRA\Novato-San Marin.sip7

HCM Signalized Intersection Capacity Analysis
10: Wilson Ave & Novato Blvd

02/15/2018



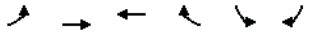
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	680	17	262	466	28	458
Future Volume (vph)	680	17	262	466	28	458
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.9		3.0	3.6	3.6	3.6
Lane Util. Factor	0.95		1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3560		1787	3610	1805	1593
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3560		1787	3610	1805	1593
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	800	20	308	548	33	539
RTOR Reduction (vph)	2	0	0	0	0	206
Lane Group Flow (vph)	818	0	308	548	33	333
Confl. Peds. (#/hr)		3			6	2
Heavy Vehicles (%)	1%	0%	1%	0%	0%	0%
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases						4
Actuated Green, G (s)	32.1		17.3	39.7	20.1	20.1
Effective Green, g (s)	32.1		17.3	39.7	20.1	20.1
Actuated g/C Ratio	0.40		0.22	0.50	0.25	0.25
Clearance Time (s)	3.9		3.0	3.6	3.6	3.6
Vehicle Extension (s)	3.0		2.0	3.0	2.0	2.0
Lane Grp Cap (vph)	1428		386	1791	453	400
v/s Ratio Prot	c0.23		c0.17	0.15	0.02	
v/s Ratio Perm						c0.21
v/c Ratio	0.57		0.80	0.31	0.07	0.83
Uniform Delay, d1	18.6		29.7	12.0	22.8	28.4
Progression Factor	1.00		1.00	0.51	1.00	1.00
Incremental Delay, d2	1.7		9.7	0.4	0.0	13.2
Delay (s)	20.3		39.4	6.6	22.9	41.6
Level of Service	C		D	A	C	D
Approach Delay (s)	20.3			18.4	40.5	
Approach LOS	C			B	D	

Intersection Summary				
HCM 2000 Control Delay	24.7	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.70			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.5	
Intersection Capacity Utilization	54.6%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
11: Novato Blvd & Simmons Ln

02/15/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	278	840	480	91	86	268
Future Volume (vph)	278	840	480	91	86	268
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.9	3.6		3.0	3.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	3574	3512		1805	1599
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1805	3574	3512		1805	1599
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	327	988	565	107	101	315
RTOR Reduction (vph)	0	0	16	0	0	233
Lane Group Flow (vph)	327	988	656	0	101	82
Confl. Peds. (#/hr)					2	
Confl. Bikes (#/hr)				1		
Heavy Vehicles (%)	0%	1%	0%	0%	0%	1%
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	5	2	6		8	
Permitted Phases						8
Actuated Green, G (s)	10.0	32.1	39.7		20.7	20.7
Effective Green, g (s)	10.0	32.1	39.7		20.7	20.7
Actuated g/C Ratio	0.12	0.40	0.50		0.26	0.26
Clearance Time (s)	3.0	3.9	3.6		3.0	3.0
Vehicle Extension (s)	2.0	3.0	3.0		2.0	2.0
Lane Grp Cap (vph)	225	1434	1742		467	413
v/s Ratio Prot	c0.18	c0.28	c0.19		c0.06	
v/s Ratio Perm						0.05
v/c Ratio	1.45	0.69	0.38		0.22	0.20
Uniform Delay, d1	35.0	19.8	12.5		23.3	23.2
Progression Factor	0.79	0.63	1.00		1.00	1.00
Incremental Delay, d2	222.4	2.1	0.6		0.1	0.1
Delay (s)	250.1	14.7	13.1		23.4	23.2
Level of Service	F	B	B		C	C
Approach Delay (s)		73.2	13.1		23.3	
Approach LOS		E	B		C	

Intersection Summary				
HCM 2000 Control Delay	47.8	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.57			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.5	
Intersection Capacity Utilization	46.6%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
12: Novato Blvd & Grant Ave

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	199	826	3	4	416	57	1	0	2	35	1	184
Future Volume (vph)	199	826	3	4	416	57	1	0	2	35	1	184
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.5	4.5	3.5	4.9	4.9		4.0		3.5	3.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00		1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.96		0.97		1.00	0.98	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00		1.00		0.98	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.91		1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.98		0.95	1.00	
Satd. Flow (prot)	1787	1863	1576	1805	3539	1534		1644		1748	1569	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.70		0.76	1.00	
Satd. Flow (perm)	1787	1863	1576	1805	3539	1534		1175		1390	1569	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	234	972	4	5	489	67	1	0	2	41	1	216
RTOR Reduction (vph)	0	0	1	0	0	27	0	3	0	0	192	0
Lane Group Flow (vph)	234	972	3	5	489	40	0	0	0	41	25	0
Confl. Peds. (#/hr)			1			8	5		12	12		5
Confl. Bikes (#/hr)			4			2			2			1
Heavy Vehicles (%)	1%	2%	0%	0%	2%	1%	0%	0%	0%	1%	0%	1%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8			4		
Actuated Green, G (s)	16.7	76.0	76.0	1.2	60.1	60.1		10.8		11.3	11.3	
Effective Green, g (s)	16.7	76.0	76.0	1.2	60.1	60.1		10.8		11.3	11.3	
Actuated g/C Ratio	0.17	0.76	0.76	0.01	0.60	0.60		0.11		0.11	0.11	
Clearance Time (s)	3.5	4.5	4.5	3.5	4.9	4.9		4.0		3.5	3.5	
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0	3.0		2.0		2.0	2.0	
Lane Grp Cap (vph)	298	1415	1197	21	2126	921		126		157	177	
v/s Ratio Prot	c0.13	c0.52		0.00	0.14						0.02	
v/s Ratio Perm			0.00			0.03		0.00		c0.03		
v/c Ratio	0.79	0.69	0.00	0.24	0.23	0.04		0.00		0.26	0.14	
Uniform Delay, d1	39.9	6.0	2.9	48.9	9.2	8.2		39.8		40.5	40.0	
Progression Factor	1.00	1.00	1.00	0.89	0.98	1.43		1.00		1.00	1.00	
Incremental Delay, d2	11.8	1.4	0.0	2.0	0.2	0.1		0.0		0.3	0.1	
Delay (s)	51.7	7.4	2.9	45.4	9.3	11.8		39.8		40.9	40.1	
Level of Service	D	A	A	D	A	B		D		D	D	
Approach Delay (s)		16.0			9.9			39.8			40.2	
Approach LOS		B			A			D			D	

Intersection Summary					
HCM 2000 Control Delay	17.4	HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio	0.68				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		12.4	
Intersection Capacity Utilization	72.5%	ICU Level of Service		C	
Analysis Period (min)	15				
c Critical Lane Group					

HCM Signalized Intersection Capacity Analysis
13: Tamalpais Ave/7th St & Novato Blvd

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	93	736	36	60	442	121	37	99	34	72	105	45
Future Volume (vph)	93	736	36	60	442	121	37	99	34	72	105	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.0		3.5	5.0	5.0	3.5	3.5		3.5	3.5	3.5
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.95	1.00	0.99		1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.99	1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1787	1847		1787	1863	1523	1770	1798		1784	1881	1531
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.57	1.00		0.48	1.00	1.00
Satd. Flow (perm)	1787	1847		1787	1863	1523	1068	1798		902	1881	1531
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)	99	783	38	64	470	129	39	105	36	77	112	48
RTOR Reduction (vph)	0	1	0	0	0	20	0	15	0	0	0	41
Lane Group Flow (vph)	99	820	0	64	470	109	39	126	0	77	112	7
Confl. Peds. (#/hr)			11			17	6		1	1		6
Confl. Bikes (#/hr)			9			1			1			4
Heavy Vehicles (%)	1%	2%	1%	1%	2%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8			4		4
Actuated Green, G (s)	9.1	66.6		7.7	65.2	65.2	13.7	13.7		13.7	13.7	13.7
Effective Green, g (s)	9.1	66.6		7.7	65.2	65.2	13.7	13.7		13.7	13.7	13.7
Actuated g/C Ratio	0.09	0.67		0.08	0.65	0.65	0.14	0.14		0.14	0.14	0.14
Clearance Time (s)	3.5	5.0		3.5	5.0	5.0	3.5	3.5		3.5	3.5	3.5
Vehicle Extension (s)	2.0	5.0		2.0	5.0	5.0	2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	162	1230		137	1214	992	146	246		123	257	209
v/s Ratio Prot	c0.06	c0.44		0.04	0.25			0.07			0.06	
v/s Ratio Perm						0.07	0.04			c0.09		0.00
v/c Ratio	0.61	0.67		0.47	0.39	0.11	0.27	0.51		0.63	0.44	0.03
Uniform Delay, d1	43.7	10.0		44.2	8.1	6.5	38.7	40.1		40.7	39.6	37.4
Progression Factor	0.87	1.08		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.6	2.2		0.9	0.9	0.2	0.4	0.8		7.0	0.4	0.0
Delay (s)	41.7	13.1		45.1	9.0	6.7	39.0	40.8		47.7	40.0	37.4
Level of Service	D	B		D	A	A	D	D		D	D	D
Approach Delay (s)		16.1			12.1			40.4			42.0	
Approach LOS		B			B			D			D	

Intersection Summary					
HCM 2000 Control Delay	20.0	HCM 2000 Level of Service		C	
HCM 2000 Volume to Capacity ratio	0.66				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	79.4%	ICU Level of Service		D	
Analysis Period (min)	15				
c Critical Lane Group					

HCM Signalized Intersection Capacity Analysis
14: Novato Blvd & Diablo Ave

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	234	35	200	236	318	34	295	207	451	391	28
Future Volume (vph)	22	234	35	200	236	318	34	295	207	451	391	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	11	11	12	11	11	12	12	12	12
Total Lost time (s)		3.7		4.1	4.1	4.1	4.4	4.4	4.4	4.1	4.1	
Lane Util. Factor		0.95		0.91	0.91	1.00	1.00	1.00	1.00	0.91	0.91	
Frpb, ped/bikes		1.00		1.00	1.00	0.95	1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes		1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected		1.00		0.95	0.99	1.00	0.95	1.00	1.00	0.95	0.99	
Satd. Flow (prot)		3488		1557	3271	1512	1728	1801	1557	1610	3317	
Flt Permitted		1.00		0.95	0.99	1.00	0.95	1.00	1.00	0.95	0.99	
Satd. Flow (perm)		3488		1557	3271	1512	1728	1801	1557	1610	3317	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	22	239	36	204	241	324	35	301	211	460	399	29
RTOR Reduction (vph)	0	8	0	0	0	216	0	0	163	0	2	0
Lane Group Flow (vph)	0	289	0	145	300	108	35	301	48	290	596	0
Confl. Peds. (#/hr)			7			15			2			4
Confl. Bikes (#/hr)			1			1			3			5
Heavy Vehicles (%)	1%	1%	1%	2%	1%	2%	1%	2%	2%	2%	2%	1%
Turn Type	Split	NA		Split	NA	Perm	Split	NA	Perm	Split	NA	
Protected Phases	3	3		4	4		1	1		2	2	
Permitted Phases						4			1		2	
Actuated Green, G (s)		14.3		15.0	15.0	15.0	20.2	20.2	20.2	22.6	22.6	
Effective Green, g (s)		14.3		15.0	15.0	15.0	20.2	20.2	20.2	22.6	22.6	
Actuated g/C Ratio		0.16		0.17	0.17	0.17	0.23	0.23	0.23	0.26	0.26	
Clearance Time (s)		3.7		4.1	4.1	4.1	4.4	4.4	4.4	4.1	4.1	
Vehicle Extension (s)		2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)		564		264	555	256	394	411	355	411	848	
v/s Ratio Prot		c0.08		c0.09	0.09		0.02	c0.17		c0.18	0.18	
v/s Ratio Perm						0.07			0.03			
v/c Ratio		0.51		0.55	0.54	0.42	0.09	0.73	0.14	0.71	0.70	
Uniform Delay, d1		33.9		33.6	33.5	32.8	26.9	31.6	27.2	29.9	29.9	
Progression Factor		1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.3		1.3	0.6	0.4	0.0	5.7	0.1	4.5	2.2	
Delay (s)		34.2		34.9	34.1	33.2	26.9	37.3	27.2	34.3	32.0	
Level of Service		C		C	C	C	C	D	C	C	C	
Approach Delay (s)		34.2			33.9			32.8			32.8	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM 2000 Control Delay	33.3	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.64			
Actuated Cycle Length (s)	88.4	Sum of lost time (s)	16.3	
Intersection Capacity Utilization	71.6%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
14: Diablo Ave & Novato Blvd

02/23/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	234	35	200	236	318	34	295	207	451	391	28
Future Volume (vph)	22	234	35	200	236	318	34	295	207	451	391	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	12	11	11	12	10	12	12
Total Lost time (s)	4.0	4.1	4.1	4.0	4.0	4.0	4.0	4.1		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		0.97	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	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		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1728	1818	1518	1711	1818	1558	1728	3188		3204	1841	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1728	1818	1518	1711	1818	1558	1728	3188		3204	1841	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	22	239	36	204	241	324	35	301	211	460	399	29
RTOR Reduction (vph)	0	0	28	0	0	138	0	128	0	0	3	0
Lane Group Flow (vph)	22	239	8	204	241	186	35	384	0	460	425	0
Confl. Peds. (#/hr)			7			15			2			4
Confl. Bikes (#/hr)			1			1			3			5
Heavy Vehicles (%)	1%	1%	1%	2%	1%	2%	1%	2%	2%	2%	2%	1%
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	1.7	18.9	18.9	13.5	30.8	47.4	3.3	17.5		16.6	30.9	
Effective Green, g (s)	1.7	18.9	18.9	13.5	30.8	47.4	3.3	17.5		16.6	30.9	
Actuated g/C Ratio	0.02	0.23	0.23	0.16	0.37	0.57	0.04	0.21		0.20	0.37	
Clearance Time (s)	4.0	4.1	4.1	4.0	4.0	4.0	4.0	4.1		4.0	4.0	
Vehicle Extension (s)	3.0	2.0	2.0	3.0	3.0	3.0	3.0	2.0		3.0	3.0	
Lane Grp Cap (vph)	35	415	346	279	677	968	68	674		643	687	
v/s Ratio Prot	0.01	c0.13		c0.12	0.13	0.04	0.02	0.12		c0.14	c0.23	
v/s Ratio Perm			0.01			0.08						
v/c Ratio	0.63	0.58	0.02	0.73	0.36	0.19	0.51	0.57		0.72	0.62	
Uniform Delay, d1	40.2	28.3	24.7	32.9	18.8	8.5	38.9	29.2		30.8	21.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	30.3	1.2	0.0	9.5	0.3	0.1	6.4	0.7		3.8	1.7	
Delay (s)	70.5	29.5	24.8	42.3	19.1	8.6	45.4	30.0		34.6	22.8	
Level of Service	E	C	C	D	B	A	D	C		C	C	
Approach Delay (s)		32.0			20.8			30.9			28.9	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM 2000 Control Delay	27.2	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.68			
Actuated Cycle Length (s)	82.7	Sum of lost time (s)	16.2	
Intersection Capacity Utilization	68.6%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
15: Redwood Blvd & Diablo Ave/De Long Ave

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	214	471	167	156	566	202	53	138	30	214	271	164
Future Volume (vph)	214	471	167	156	566	202	53	138	30	214	271	164
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	9
Total Lost time (s)	5.0	4.0		5.0	4.1		4.0	4.8	4.8	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95	1.00	0.97	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3467	3450		1805	3356		1805	3610	1505	3303	1900	1408
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3467	3450		1805	3356		1805	3610	1505	3303	1900	1408
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	233	512	182	170	615	220	58	150	33	233	295	178
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	15	0	0	58
Lane Group Flow (vph)	233	694	0	170	835	0	58	150	18	233	295	120
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			5			5			5			5
Heavy Vehicles (%)	1%	0%	0%	0%	2%	5%	0%	0%	5%	6%	0%	1%
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)	17.0	48.2		17.0	48.1		10.4	36.0	36.0	11.0	37.4	37.4
Effective Green, g (s)	17.0	48.2		17.0	48.1		10.4	36.0	36.0	11.0	37.4	37.4
Actuated g/C Ratio	0.13	0.37		0.13	0.37		0.08	0.28	0.28	0.08	0.29	0.29
Clearance Time (s)	5.0	4.0		5.0	4.1		4.0	4.8	4.8	4.0	4.0	4.0
Vehicle Extension (s)	2.5	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	453	1279		236	1241		144	999	416	279	546	405
v/s Ratio Prot	0.07	0.20		c0.09	c0.25		0.03	0.04		c0.07	c0.16	
v/s Ratio Perm									0.01			0.09
v/c Ratio	0.51	0.54		0.72	0.67		0.40	0.15	0.04	0.84	0.54	0.30
Uniform Delay, d1	52.7	32.2		54.2	34.4		56.8	35.5	34.4	58.6	39.0	36.1
Progression Factor	1.00	1.00		1.13	0.87		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	1.7		7.7	2.6		0.7	0.3	0.2	18.2	3.8	1.9
Delay (s)	53.4	33.9		69.0	32.5		57.5	35.8	34.6	76.8	42.9	37.9
Level of Service	D	C		E	C		E	D	C	E	D	D
Approach Delay (s)		38.8			38.6			40.8			52.8	
Approach LOS		D			D			D			D	

Intersection Summary				
HCM 2000 Control Delay	42.3	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.66			
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	17.9	
Intersection Capacity Utilization	103.4%	ICU Level of Service	G	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
16: Reichert Ave & De Long Ave

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	68	659	11	61	931	201	12	21	38	190	35	75
Future Volume (vph)	68	659	11	61	931	201	12	21	38	190	35	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.1		3.0	4.1		3.5	3.5	3.5	3.5	3.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00	0.98	1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00	1.00	0.99	1.00	
Frt	1.00	1.00		1.00	0.97		1.00	1.00	0.85	1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1805	3530		1805	3460		1793	1900	1578	1778	1676	
Flt Permitted	0.95	1.00		0.95	1.00		0.56	1.00	1.00	0.74	1.00	
Satd. Flow (perm)	1805	3530		1805	3460		1065	1900	1578	1389	1676	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	76	732	12	68	1034	223	13	23	42	211	39	83
RTOR Reduction (vph)	0	0	0	0	6	0	0	0	9	0	28	0
Lane Group Flow (vph)	76	744	0	68	1251	0	13	23	33	211	94	0
Confl. Peds. (#/hr)			6			3	6		4	4		6
Confl. Bikes (#/hr)			5			5			5			5
Heavy Vehicles (%)	0%	2%	0%	0%	1%	1%	0%	0%	0%	1%	0%	0%
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	8.9	86.2		8.5	85.8		24.7	24.7	24.7	24.7	24.7	
Effective Green, g (s)	8.9	86.2		8.5	85.8		24.7	24.7	24.7	24.7	24.7	
Actuated g/C Ratio	0.07	0.66		0.07	0.66		0.19	0.19	0.19	0.19	0.19	
Clearance Time (s)	3.0	4.1		3.0	4.1		3.5	3.5	3.5	3.5	3.5	
Vehicle Extension (s)	2.0	3.0		2.0	3.0		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	123	2340		118	2283		202	361	299	263	318	
v/s Ratio Prot	c0.04	0.21		0.04	c0.36			0.01			0.06	
v/s Ratio Perm							0.01		0.02	c0.15		
v/c Ratio	0.62	0.32		0.58	0.55		0.06	0.06	0.11	0.80	0.30	
Uniform Delay, d1	58.9	9.3		59.0	11.8		43.2	43.2	43.6	50.3	45.2	
Progression Factor	0.99	1.19		1.07	0.98		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	5.3	0.3		3.9	0.9		0.0	0.0	0.1	15.2	0.2	
Delay (s)	63.7	11.4		67.2	12.4		43.2	43.2	43.6	65.5	45.4	
Level of Service	E	B		E	B		D	D	D	E	D	
Approach Delay (s)		16.3			15.2			43.4			58.1	
Approach LOS		B			B			D			E	

Intersection Summary				
HCM 2000 Control Delay	22.0	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.60			
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	10.6	
Intersection Capacity Utilization	67.9%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
17: US 101 SB Ramps & De Long Ave

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	188	669	20	820	0	0	0	0	11	2	303
Future Volume (vph)	0	188	669	20	820	0	0	0	0	11	2	303
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.6	3.6	3.0	3.6					4.0	4.0	
Lane Util. Factor		0.95	1.00	1.00	0.95					0.95	0.95	
Frt		1.00	0.85	1.00	1.00					1.00	0.85	
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (prot)		3574	1599	1770	3539					1681	1506	
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (perm)		3574	1599	1770	3539					1681	1506	
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)	0	200	712	21	872	0	0	0	0	12	2	322
RTOR Reduction (vph)	0	0	276	0	0	0	0	0	0	0	118	0
Lane Group Flow (vph)	0	200	436	21	872	0	0	0	0	11	207	0
Heavy Vehicles (%)	0%	1%	1%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type		NA	Perm	Prot	NA					Split	NA	
Protected Phases		6		5	2					4	4	
Permitted Phases			6									
Actuated Green, G (s)		39.8	39.8	1.4	44.2					13.2	13.2	
Effective Green, g (s)		39.8	39.8	1.4	44.2					13.2	13.2	
Actuated g/C Ratio		0.61	0.61	0.02	0.68					0.20	0.20	
Clearance Time (s)		3.6	3.6	3.0	3.6					4.0	4.0	
Vehicle Extension (s)		4.0	4.0	2.0	4.0					2.5	2.5	
Lane Grp Cap (vph)		2188	979	38	2406					341	305	
v/s Ratio Prot		0.06		c0.01	0.25					0.01	c0.14	
v/s Ratio Perm			c0.27									
v/c Ratio		0.09	0.45	0.55	0.36					0.03	0.68	
Uniform Delay, d1		5.2	6.7	31.5	4.4					20.8	23.9	
Progression Factor		1.03	6.58	1.00	1.00					1.00	1.00	
Incremental Delay, d2		0.1	1.4	9.5	0.4					0.0	5.4	
Delay (s)		5.4	45.6	41.0	4.8					20.8	29.3	
Level of Service		A	D	D	A					C	C	
Approach Delay (s)		36.8			5.7			0.0			29.0	
Approach LOS		D			A			A			C	

Intersection Summary				
HCM 2000 Control Delay	22.6	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.50			
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	10.6	
Intersection Capacity Utilization	64.5%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
18: US 101 NB Ramps & De Long Ave

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	166	33	0	1	58	9	783	2	17	0	0	0
Future Volume (vph)	166	33	0	1	58	9	783	2	17	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.6			3.6		4.5	4.5				
Lane Util. Factor	1.00	0.95			0.95		0.95	0.95				
Frt	1.00	1.00			0.98		1.00	0.99				
Flt Protected	0.95	1.00			1.00		0.95	0.95				
Satd. Flow (prot)	1770	3610			3483		1698	1690				
Flt Permitted	0.95	1.00			0.95		0.95	0.95				
Satd. Flow (perm)	1770	3610			3316		1698	1690				
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	189	38	0	1	66	10	890	2	19	0	0	0
RTOR Reduction (vph)	0	0	0	0	9	0	0	2	0	0	0	0
Lane Group Flow (vph)	189	38	0	0	68	0	454	455	0	0	0	0
Heavy Vehicles (%)	2%	0%	0%	0%	0%	12%	1%	0%	8%	0%	0%	0%
Turn Type	Prot	NA			NA		Split	NA				
Protected Phases	1	6			2		4	4				
Permitted Phases												
Actuated Green, G (s)	8.9	17.0			4.6		20.8	20.8				
Effective Green, g (s)	8.9	17.0			4.6		20.8	20.8				
Actuated g/C Ratio	0.19	0.37			0.10		0.45	0.45				
Clearance Time (s)	3.5	3.6			3.6		4.5	4.5				
Vehicle Extension (s)	2.5	2.0			2.0		3.0	3.0				
Lane Grp Cap (vph)	343	1337			332		769	765				
v/s Ratio Prot	c0.11	0.01					0.27	c0.27				
v/s Ratio Perm					c0.02							
v/c Ratio	0.55	0.03			1.00dr		0.59	0.60				
Uniform Delay, d1	16.7	9.2			19.0		9.4	9.4				
Progression Factor	1.00	1.00			1.00		1.00	1.00				
Incremental Delay, d2	1.5	0.0			0.1		1.2	1.3				
Delay (s)	18.2	9.2			19.1		10.6	10.6				
Level of Service	B	A			B		B	B				
Approach Delay (s)		16.7			19.1			10.6			0.0	
Approach LOS		B			B			B			A	

Intersection Summary				
HCM 2000 Control Delay	12.3	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.53			
Actuated Cycle Length (s)	45.9	Sum of lost time (s)	11.6	
Intersection Capacity Utilization	45.2%	ICU Level of Service	A	
Analysis Period (min)	15			

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
19: Redwood Blvd & Lamont Ave 02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	2	8	100	2	50	16	263	41	65	490	28
Future Volume (vph)	10	2	8	100	2	50	16	263	41	65	490	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	3.5		3.5	3.5	3.5	4.8		3.5	4.8	4.8
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes		1.00	1.00		1.00	0.99	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85		1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected		0.96	1.00		0.95	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1822	1615		1811	1595	1805	3527		1805	3610	1615
Flt Permitted		0.84	1.00		0.74	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1599	1615		1405	1595	1805	3527		1805	3610	1615
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	11	2	9	110	2	55	18	289	45	71	538	31
RTOR Reduction (vph)	0	0	7	0	0	40	0	12	0	0	0	17
Lane Group Flow (vph)	0	13	2	0	112	15	18	322	0	71	538	14
Confl. Peds. (#/hr)	1					1			2			
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8		8	4		4						2
Actuated Green, G (s)		12.7	12.7		12.7	12.7	0.9	18.9		3.1	21.1	21.1
Effective Green, g (s)		12.7	12.7		12.7	12.7	0.9	18.9		3.1	21.1	21.1
Actuated g/C Ratio		0.27	0.27		0.27	0.27	0.02	0.41		0.07	0.45	0.45
Clearance Time (s)		3.5	3.5		3.5	3.5	3.5	4.8		3.5	4.8	4.8
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0	3.0		2.0	3.0	3.0
Lane Grp Cap (vph)		436	441		383	435	34	1433		120	1638	732
v/s Ratio Prot							0.01	0.09		c0.04	c0.15	
v/s Ratio Perm		0.01	0.00		c0.08	0.01						0.01
v/c Ratio		0.03	0.01		0.29	0.03	0.53	0.22		0.59	0.33	0.02
Uniform Delay, d1		12.4	12.3		13.4	12.4	22.6	9.0		21.1	8.2	7.0
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		0.0	0.0		0.2	0.0	6.7	0.1		5.1	0.1	0.0
Delay (s)		12.4	12.3		13.5	12.4	29.3	9.1		26.2	8.3	7.0
Level of Service		B	B		B	B	C	A		C	A	A
Approach Delay (s)		12.4			13.1			10.1			10.2	
Approach LOS		B			B			B			B	

Intersection Summary				
HCM 2000 Control Delay	10.6	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.34			
Actuated Cycle Length (s)	46.5	Sum of lost time (s)	11.8	
Intersection Capacity Utilization	44.7%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
20: Redwood Blvd & Landing Ct 02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	0	1	25	0	12	1	306	32	25	479	1
Future Volume (vph)	2	0	1	25	0	12	1	306	32	25	479	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5		3.5		3.5		4.8	4.8	3.5	4.8	4.8
Lane Util. Factor		1.00		1.00		1.00		0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes		1.00		1.00		1.00		1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes		1.00		1.00		1.00		1.00	1.00	1.00	1.00	1.00
Frt		0.95		1.00		0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected		0.97		0.95		1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1748		1803		1615		3609	1579	1805	3610	1572
Flt Permitted		0.97		1.00		1.00		0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1748		1898		1615		3444	1579	1805	3610	1572
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2	0	1	27	0	13	1	333	35	27	521	1
RTOR Reduction (vph)	0	3	0	0	0	12	0	0	13	0	0	0
Lane Group Flow (vph)	0	0	0	27	0	1	0	334	22	27	521	1
Confl. Peds. (#/hr)			4	4					3			6
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA		Perm		Perm	Perm	NA	Perm	Prot	NA	Perm
Protected Phases		4						2		1	6	
Permitted Phases	4			8		8	2		2			6
Actuated Green, G (s)		4.0		4.0		4.0		26.9	26.9	0.8	31.2	31.2
Effective Green, g (s)		4.0		4.0		4.0		26.9	26.9	0.8	31.2	31.2
Actuated g/C Ratio		0.09		0.09		0.09		0.62	0.62	0.02	0.72	0.72
Clearance Time (s)		3.5		3.5		3.5		4.8	4.8	3.5	4.8	4.8
Vehicle Extension (s)		3.0		2.0		2.0		4.0	4.0	2.0	4.0	4.0
Lane Grp Cap (vph)		160		174		148		2129	976	33	2589	1127
v/s Ratio Prot										c0.01	c0.14	
v/s Ratio Perm		0.00		c0.01		0.00		0.10	0.01			0.00
v/c Ratio		0.00		0.16		0.01		0.16	0.02	0.82	0.20	0.00
Uniform Delay, d1		17.9		18.2		17.9		3.5	3.2	21.3	2.0	1.7
Progression Factor		1.00		1.00		1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.0		0.2		0.0		0.0	0.0	81.1	0.1	0.0
Delay (s)		17.9		18.3		18.0		3.6	3.2	102.4	2.1	1.7
Level of Service		B		B		B		A	A	F	A	A
Approach Delay (s)		17.9			18.2			3.5			7.0	
Approach LOS		B			B			A			A	

Intersection Summary				
HCM 2000 Control Delay	6.2	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.23			
Actuated Cycle Length (s)	43.5	Sum of lost time (s)	11.8	
Intersection Capacity Utilization	40.5%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
21: Novato Blvd & Center Rd/Garden Ct

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	0	298	3	0	3	121	455	4	1	663	66
Future Volume (vph)	56	0	298	3	0	3	121	455	4	1	663	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.2	3.2			3.0		3.0	4.4		3.0	4.4	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.85			0.93		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1615			1729		1805	3604		1805	3518	
Flt Permitted	0.75	1.00			0.58		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1432	1615			1035		1805	3604		1805	3518	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	61	0	324	3	0	3	132	495	4	1	721	72
RTOR Reduction (vph)	0	288	0	0	5	0	0	0	0	0	4	0
Lane Group Flow (vph)	61	36	0	0	1	0	132	499	0	1	789	0
Confl. Peds. (#/hr)									9			6
Confl. Bikes (#/hr)									2			
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4								
Actuated Green, G (s)	11.2	11.2			11.4		12.3	76.0		2.2	65.9	
Effective Green, g (s)	11.2	11.2			11.4		12.3	76.0		2.2	65.9	
Actuated g/C Ratio	0.11	0.11			0.11		0.12	0.76		0.02	0.66	
Clearance Time (s)	3.2	3.2			3.0		3.0	4.4		3.0	4.4	
Vehicle Extension (s)	3.0	3.0			2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	160	180			117		222	2739		39	2318	
v/s Ratio Prot		0.02					c0.07	0.14		0.00	c0.22	
v/s Ratio Perm	c0.04				0.00							
v/c Ratio	0.38	0.20			0.01		0.59	0.18		0.03	0.34	
Uniform Delay, d1	41.2	40.3			39.3		41.5	3.3		47.9	7.5	
Progression Factor	1.00	1.00			1.00		0.73	1.24		1.00	1.00	
Incremental Delay, d2	1.5	0.6			0.0		2.8	0.1		0.1	0.4	
Delay (s)	42.7	40.9			39.3		33.2	4.3		47.9	7.9	
Level of Service	D	D			D		C	A		D	A	
Approach Delay (s)		41.2			39.3			10.3			7.9	
Approach LOS		D			D			B			A	

Intersection Summary				
HCM 2000 Control Delay	15.9	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.38			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.6	
Intersection Capacity Utilization	57.6%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
22: Novato Blvd & Arthur St

02/15/2018

Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	157	124	220	492	18	834	180
Future Volume (vph)	157	124	220	492	18	834	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5	3.5	4.9	3.5	4.9	
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	0.95	
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	0.99	
Flpb, ped/bikes	0.99	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	1.00	0.97	
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1785	1579	1805	3610	1805	3466	
Flt Permitted	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (perm)	1785	1579	1805	3610	1805	3466	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	171	135	239	535	20	907	196
RTOR Reduction (vph)	0	114	0	0	0	13	0
Lane Group Flow (vph)	171	21	239	535	20	1090	0
Confl. Peds. (#/hr)	10	8					5
Confl. Bikes (#/hr)		1					
Heavy Vehicles (%)	0%	0%	0%	0%	0%	1%	0%
Turn Type	Perm	Perm	Prot	NA	Prot	NA	
Protected Phases			1	6	5	2	
Permitted Phases	4	4					
Actuated Green, G (s)	15.5	15.5	17.3	69.9	2.7	55.3	
Effective Green, g (s)	15.5	15.5	17.3	69.9	2.7	55.3	
Actuated g/C Ratio	0.16	0.16	0.17	0.70	0.03	0.55	
Clearance Time (s)	3.5	3.5	3.5	4.9	3.5	4.9	
Vehicle Extension (s)	2.0	2.0	2.0	4.0	2.0	4.0	
Lane Grp Cap (vph)	276	244	312	2523	48	1916	
v/s Ratio Prot			c0.13	0.15	0.01	c0.31	
v/s Ratio Perm	c0.10	0.01					
v/c Ratio	0.62	0.09	0.77	0.21	0.42	0.57	
Uniform Delay, d1	39.5	36.2	39.4	5.3	47.9	14.6	
Progression Factor	1.00	1.00	0.88	0.76	1.37	0.74	
Incremental Delay, d2	2.9	0.1	8.2	0.2	2.0	1.2	
Delay (s)	42.4	36.2	43.0	4.2	67.7	12.0	
Level of Service	D	D	D	A	E	B	
Approach Delay (s)	39.7			16.2		13.0	
Approach LOS	D			B		B	

Intersection Summary				
HCM 2000 Control Delay	17.8	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.62			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.9	
Intersection Capacity Utilization	63.8%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
23: Novato Blvd & Rowland Blvd

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	135	15	353	308	337	43	295	216	372	419	179
Future Volume (vph)	44	135	15	353	308	337	43	295	216	372	419	179
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5		3.5	4.1	4.1	3.5	4.1		3.5	4.4	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		0.97	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.99	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	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.94		1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1858		1770	1900	1576	1805	1745		3502	1794	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1805	1858		1770	1900	1576	1805	1745		3502	1794	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	46	142	16	372	324	355	45	311	227	392	441	188
RTOR Reduction (vph)	0	4	0	0	0	251	0	23	0	0	13	0
Lane Group Flow (vph)	46	154	0	372	324	104	45	515	0	392	616	0
Confl. Peds. (#/hr)			24			2			13			10
Confl. Bikes (#/hr)			1						1			
Heavy Vehicles (%)	0%	0%	0%	2%	0%	1%	0%	0%	2%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases						4						
Actuated Green, G (s)	5.6	18.1		17.5	29.4	29.4	5.7	35.6		14.2	43.8	
Effective Green, g (s)	5.6	18.1		17.5	29.4	29.4	5.7	35.6		14.2	43.8	
Actuated g/C Ratio	0.06	0.18		0.18	0.29	0.29	0.06	0.36		0.14	0.44	
Clearance Time (s)	3.5	3.5		3.5	4.1	4.1	3.5	4.1		3.5	4.4	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	3.0		2.0	2.0	
Lane Grp Cap (vph)	101	336		309	558	463	102	621		497	785	
v/s Ratio Prot	0.03	0.08		c0.21	c0.17		0.02	c0.30		0.11	c0.34	
v/s Ratio Perm						0.07						
v/c Ratio	0.46	0.46		1.20	0.58	0.23	0.44	0.83		0.79	0.78	
Uniform Delay, d1	45.7	36.6		41.2	30.1	26.7	45.6	29.4		41.5	24.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.19	0.63	
Incremental Delay, d2	1.2	0.4		118.4	1.0	0.1	1.1	12.1		6.5	6.7	
Delay (s)	46.9	36.9		159.7	31.0	26.8	46.7	41.6		55.8	21.9	
Level of Service	D	D		F	C	C	D	D		E	C	
Approach Delay (s)		39.2			75.1			42.0			34.9	
Approach LOS		D			E			D			C	

Intersection Summary				
HCM 2000 Control Delay	51.4	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.88			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.5	
Intersection Capacity Utilization	88.3%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
24: Redwood Blvd & Rowland Blvd

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	112	659	47	20	783	269	69	22	77	288	18	294
Future Volume (vph)	112	659	47	20	783	269	69	22	77	288	18	294
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.4	4.4	3.5	3.7	3.7	3.5	4.1		3.5	4.8	4.8
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.99	1.00	0.99		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		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1805	3574	1589	1805	3574	1578	1805	3151		3502	1900	1593
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1805	3574	1589	1805	3574	1578	1805	3151		3502	1900	1593
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	126	740	53	22	880	302	78	25	87	324	20	330
RTOR Reduction (vph)	0	0	27	0	0	73	0	75	0	0	0	244
Lane Group Flow (vph)	126	740	26	22	880	229	78	37	0	324	20	86
Confl. Peds. (#/hr)			6			2			3			2
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	0%	1%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						4
Actuated Green, G (s)	11.1	39.0	39.0	3.0	31.6	31.6	8.0	10.7		12.6	14.6	14.6
Effective Green, g (s)	11.1	39.0	39.0	3.0	31.6	31.6	8.0	10.7		12.6	14.6	14.6
Actuated g/C Ratio	0.14	0.48	0.48	0.04	0.39	0.39	0.10	0.13		0.16	0.18	0.18
Clearance Time (s)	3.5	4.4	4.4	3.5	3.7	3.7	3.5	4.1		3.5	4.8	4.8
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	2.0	2.5		2.5	2.5	2.5
Lane Grp Cap (vph)	247	1725	766	67	1397	617	178	417		546	343	287
v/s Ratio Prot	c0.07	0.21		0.01	c0.25		0.04	0.01		c0.09	0.01	
v/s Ratio Perm			0.02			0.15						c0.05
v/c Ratio	0.51	0.43	0.03	0.33	0.63	0.37	0.44	0.09		0.59	0.06	0.30
Uniform Delay, d1	32.3	13.6	11.0	37.9	19.9	17.5	34.3	30.8		31.7	27.4	28.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.7	0.2	0.0	1.0	1.0	0.5	0.6	0.1		1.5	0.1	0.4
Delay (s)	33.1	13.9	11.0	39.0	20.9	18.0	34.9	30.8		33.2	27.5	29.1
Level of Service	C	B	B	D	C	B	C	C		C	C	C
Approach Delay (s)		16.3			20.5			32.5			31.0	
Approach LOS		B			C			C			C	

Intersection Summary				
HCM 2000 Control Delay	22.4	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.57			
Actuated Cycle Length (s)	80.8	Sum of lost time (s)	16.2	
Intersection Capacity Utilization	60.2%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
25: US 101 SB Ramps & Rowland Blvd

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	563	435	132	632	0	0	0	0	269	47	480
Future Volume (vph)	0	563	435	132	632	0	0	0	0	269	47	480
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.6	3.6	3.0	3.6					3.0	3.0	
Lane Util. Factor		0.91	0.91	0.97	0.95					0.91	0.91	
Frpb, ped/bikes		1.00	0.99	1.00	1.00					1.00	0.99	
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	
Frt		0.97	0.85	1.00	1.00					1.00	0.87	
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (prot)		3325	1450	3367	3574					1643	2845	
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (perm)		3325	1450	3367	3574					1643	2845	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	612	473	143	687	0	0	0	0	292	51	522
RTOR Reduction (vph)	0	23	204	0	0	0	0	0	0	0	78	0
Lane Group Flow (vph)	0	731	127	143	687	0	0	0	0	263	524	0
Confl. Peds. (#/hr)			2									2
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	0%	1%	0%	4%	1%	0%	0%	0%	0%	0%	40%	1%
Turn Type		NA	Perm	Prot	NA					Split	NA	
Protected Phases		2		1	6					4	4	
Permitted Phases			2									
Actuated Green, G (s)		17.8	17.8	3.7	24.5					15.2	15.2	
Effective Green, g (s)		17.8	17.8	3.7	24.5					15.2	15.2	
Actuated g/C Ratio		0.38	0.38	0.08	0.53					0.33	0.33	
Clearance Time (s)		3.6	3.6	3.0	3.6					3.0	3.0	
Vehicle Extension (s)		4.0	4.0	2.0	2.5					2.0	2.0	
Lane Grp Cap (vph)		1278	557	269	1891					539	933	
v/s Ratio Prot		c0.22		c0.04	0.19					0.16	c0.18	
v/s Ratio Perm			0.09									
v/c Ratio		0.57	0.23	0.53	0.36					0.49	0.92dr	
Uniform Delay, d1		11.2	9.6	20.5	6.4					12.4	12.8	
Progression Factor		1.00	1.00	1.00	1.00					1.00	1.00	
Incremental Delay, d2		0.7	0.3	1.0	0.1					0.3	0.5	
Delay (s)		12.0	9.9	21.5	6.4					12.7	13.3	
Level of Service		B	A	C	A					B	B	
Approach Delay (s)		11.4			9.0			0.0			13.1	
Approach LOS		B			A			A			B	

Intersection Summary				
HCM 2000 Control Delay	11.2	HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio	0.56			
Actuated Cycle Length (s)	46.3	Sum of lost time (s)		9.6
Intersection Capacity Utilization	51.4%	ICU Level of Service		A
Analysis Period (min)	15			

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
26: US 101 NB Ramps & Rowland Blvd

02/15/2018

Movement	EBL2	EBL	EBT	WBT	WBR	WBR2	NBL2	NBL	NBT	NBR	NEL2	NEL
Lane Configurations												
Traffic Volume (vph)	26	237	596	305	1	142	466	7	8	418	12	3
Future Volume (vph)	26	237	596	305	1	142	466	7	8	418	12	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.6	3.6		3.6	3.5		3.5	3.0		3.5
Lane Util. Factor		1.00	0.95	0.86		0.86	0.95		0.95	0.88		1.00
Frpb, ped/bikes		1.00	1.00	1.00		1.00	1.00		1.00	1.00		1.00
Flpb, ped/bikes		1.00	1.00	1.00		1.00	1.00		1.00	1.00		1.00
Frt		1.00	1.00	0.98		0.85	1.00		1.00	0.85		0.99
Flt Protected		0.95	1.00	1.00		1.00	0.95		0.95	1.00		0.96
Satd. Flow (prot)		1805	3574	4623		1323	1715		1683	2787		1800
Flt Permitted		0.95	1.00	1.00		1.00	0.95		0.95	1.00		0.96
Satd. Flow (perm)		1805	3574	4623		1323	1715		1683	2787		1800
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	28	258	648	332	1	154	507	8	9	454	13	3
RTOR Reduction (vph)	0	0	0	14	0	84	0	0	0	0	0	0
Lane Group Flow (vph)	0	286	648	364	0	25	264	0	260	454	0	17
Confl. Peds. (#/hr)										2		
Heavy Vehicles (%)	0%	0%	1%	4%	0%	5%	0%	0%	67%	2%	0%	0%
Turn Type	Prot	Prot	NA	NA		Perm	Split	Split	NA	custom	Perm	Prot
Protected Phases	5	5	2	6			8	8	8	1 8		7
Permitted Phases						6					7	
Actuated Green, G (s)		16.0	17.5	13.9		13.9	16.4		16.4	32.3		1.3
Effective Green, g (s)		16.0	17.5	13.9		13.9	16.4		16.4	28.8		1.3
Actuated g/C Ratio		0.26	0.29	0.23		0.23	0.27		0.27	0.47		0.02
Clearance Time (s)		3.0	3.6	3.6		3.6	3.5		3.5			3.5
Vehicle Extension (s)		2.0	2.0	2.0		2.0	2.0		2.0			2.0
Lane Grp Cap (vph)		471	1021	1049		300	459		451	1311		38
v/s Ratio Prot		0.16	c0.18	c0.08			0.15		c0.15	0.16		
v/s Ratio Perm						0.02						0.01
v/c Ratio		0.61	0.63	0.35		0.08	0.58		0.58	0.35		0.45
Uniform Delay, d1		19.8	19.1	19.8		18.6	19.4		19.4	10.2		29.6
Progression Factor		1.00	1.00	1.00		1.00	1.00		1.00	1.00		1.00
Incremental Delay, d2		1.5	1.0	0.1		0.0	1.1		1.1	0.1		3.0
Delay (s)		21.4	20.0	19.9		18.7	20.5		20.5	10.3		32.6
Level of Service		C	C	B		B	C		C	B		C
Approach Delay (s)			20.4	19.6					15.8			32.6
Approach LOS			C	B					B			C

Intersection Summary				
HCM 2000 Control Delay	18.5	HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio	0.54			
Actuated Cycle Length (s)	61.2	Sum of lost time (s)		13.6
Intersection Capacity Utilization	61.4%	ICU Level of Service		B
Analysis Period (min)	15			

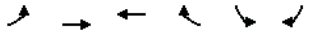
c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
26: US 101 NB Ramps & Rowland Blvd 02/15/2018

Movement	NER
Lane Configurations	
Traffic Volume (vph)	1
Future Volume (vph)	1
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	1
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	0%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM Signalized Intersection Capacity Analysis
27: Rowland Blvd & Rowland Way 02/15/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	401	608	356	22	12	82
Future Volume (vph)	401	608	356	22	12	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.6	3.2		3.2	3.2
Lane Util. Factor	0.97	0.91	0.95		1.00	0.95
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		0.89	0.85
Flt Protected	0.95	1.00	1.00		0.99	1.00
Satd. Flow (prot)	3467	5085	3398		1605	1490
Flt Permitted	0.95	1.00	1.00		0.99	1.00
Satd. Flow (perm)	3467	5085	3398		1605	1490
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	451	683	400	25	13	92
RTOR Reduction (vph)	0	0	5	0	34	45
Lane Group Flow (vph)	451	683	420	0	19	7
Confl. Peds. (#/hr)				1	2	
Heavy Vehicles (%)	1%	2%	5%	9%	6%	3%
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases						4
Actuated Green, G (s)	12.9	31.9	15.9		6.2	6.2
Effective Green, g (s)	12.9	31.9	15.9		6.2	6.2
Actuated g/C Ratio	0.29	0.71	0.35		0.14	0.14
Clearance Time (s)	3.5	3.6	3.2		3.2	3.2
Vehicle Extension (s)	2.0	4.0	4.0		2.0	2.0
Lane Grp Cap (vph)	996	3612	1203		221	205
v/s Ratio Prot	c0.13	0.13	c0.12		c0.01	
v/s Ratio Perm						0.00
v/c Ratio	0.45	0.19	0.35		0.08	0.04
Uniform Delay, d1	13.1	2.2	10.7		16.9	16.8
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.1	0.0	0.2		0.1	0.0
Delay (s)	13.2	2.2	10.9		16.9	16.8
Level of Service	B	A	B		B	B
Approach Delay (s)		6.6	10.9		16.9	
Approach LOS		A	B		B	

Intersection Summary				
HCM 2000 Control Delay	8.3	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.34			
Actuated Cycle Length (s)	44.9	Sum of lost time (s)	9.9	
Intersection Capacity Utilization	37.5%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
28: Vintage Way & Rowland Blvd

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	318	299	2	232	3	129	3	0	1	2	1
Future Volume (vph)	7	318	299	2	232	3	129	3	0	1	2	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.6	3.6	3.0	3.6		3.6	3.6			3.2	
Lane Util. Factor	1.00	0.95	0.88	1.00	0.95		0.97	1.00			1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00			0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1805	3195	2814	1805	3249		3367	1900			1813	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00			0.99	
Satd. Flow (perm)	1805	3195	2814	1805	3249		3367	1900			1813	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	8	374	352	2	273	4	152	4	0	1	2	1
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	0	0	1	0
Lane Group Flow (vph)	8	374	352	2	275	0	152	4	0	0	3	0
Confl. Peds. (#/hr)			1			3			1			
Confl. Bikes (#/hr)			2			2						
Heavy Vehicles (%)	0%	13%	1%	0%	11%	0%	4%	0%	0%	0%	0%	0%
Turn Type	Prot	NA	pt+ov	Prot	NA		Split	NA		Split	NA	
Protected Phases	5	2	2 3	1	6		3	3		4	4	
Permitted Phases												
Actuated Green, G (s)	1.1	11.0	31.1	0.5	10.4		16.5	16.5			1.1	
Effective Green, g (s)	1.1	11.0	31.1	0.5	10.4		16.5	16.5			1.1	
Actuated g/C Ratio	0.03	0.26	0.73	0.01	0.24		0.39	0.39			0.03	
Clearance Time (s)	3.0	3.6		3.0	3.6		3.6	3.6			3.2	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		3.0	3.0			2.0	
Lane Grp Cap (vph)	46	826	2059	21	795		1307	737			46	
v/s Ratio Prot	c0.00	c0.12	c0.13	0.00	0.08		0.05	0.00			c0.00	
v/s Ratio Perm												
v/c Ratio	0.17	0.45	0.17	0.10	0.35		0.12	0.01			0.07	
Uniform Delay, d1	20.3	13.2	1.7	20.8	13.2		8.3	8.0			20.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.7	0.1	0.0	0.7	0.1		0.0	0.0			0.2	
Delay (s)	20.9	13.4	1.8	21.5	13.3		8.4	8.0			20.4	
Level of Service	C	B	A	C	B		A	A			C	
Approach Delay (s)		7.9			13.4			8.4			20.4	
Approach LOS		A			B			A			C	

Intersection Summary				
HCM 2000 Control Delay	9.3	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.29			
Actuated Cycle Length (s)	42.5	Sum of lost time (s)	13.4	
Intersection Capacity Utilization	36.0%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
29: Novato Blvd & Sunset Pkwy

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	239	65	25	37	97	96	24	243	53	51	336	310
Future Volume (vph)	239	65	25	37	97	96	24	243	53	51	336	310
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.0		3.5	3.5		3.5	4.9		3.5	4.6	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	0.97		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	0.96		1.00	0.93		1.00	0.97		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	1808		1805	1712		1805	1841		1770	1715	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1787	1808		1805	1712		1805	1841		1770	1715	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	263	71	27	41	107	105	26	267	58	56	369	341
RTOR Reduction (vph)	0	14	0	0	39	0	0	7	0	0	29	0
Lane Group Flow (vph)	263	84	0	41	173	0	26	318	0	56	681	0
Confl. Peds. (#/hr)			4			21			3			5
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	0%	0%	0%	2%	1%	2%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases												
Actuated Green, G (s)	12.8	22.8		5.7	16.2		3.4	32.5		5.8	35.2	
Effective Green, g (s)	12.8	22.8		5.7	16.2		3.4	32.5		5.8	35.2	
Actuated g/C Ratio	0.15	0.28		0.07	0.20		0.04	0.39		0.07	0.43	
Clearance Time (s)	3.5	4.0		3.5	3.5		3.5	4.9		3.5	4.6	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	276	498		124	335		74	723		124	729	
v/s Ratio Prot	c0.15	0.05		0.02	c0.10		0.01	0.17		c0.03	c0.40	
v/s Ratio Perm												
v/c Ratio	0.95	0.17		0.33	0.52		0.35	0.44		0.45	0.93	
Uniform Delay, d1	34.7	22.8		36.7	29.7		38.6	18.4		36.9	22.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	40.9	0.1		0.6	0.6		1.1	0.2		1.0	18.7	
Delay (s)	75.6	22.8		37.3	30.3		39.6	18.6		37.9	41.3	
Level of Service	E	C		D	C		D	B		D	D	
Approach Delay (s)		61.3			31.4			20.1			41.1	
Approach LOS		E			C			C			D	

Intersection Summary				
HCM 2000 Control Delay	39.6	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.83			
Actuated Cycle Length (s)	82.7	Sum of lost time (s)	15.9	
Intersection Capacity Utilization	83.4%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM 2010 AWSC
30: Redwood Blvd & Novato Blvd 02/15/2018

Intersection	
Intersection Delay, s/veh	233.5
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	47	467	389	324	172	27	91	6	70	94	21	64
Future Vol, veh/h	47	467	389	324	172	27	91	6	70	94	21	64
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	1	2	1	1	2	1	1	1	1	1	1	1
Mvmt Flow	51	502	418	348	185	29	98	6	75	101	23	69
Number of Lanes	1	1	0	1	1	0	1	1	1	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	3	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	2	2	2
HCM Control Delay	432.1	33.9	16.7	17.1
HCM LOS	F	D	C	C

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	100%	0%	0%	55%	0%	86%	0%	25%
Vol Right, %	0%	0%	100%	0%	45%	0%	14%	0%	75%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	91	6	70	47	856	324	199	94	85
LT Vol	91	0	0	47	0	324	0	94	0
Through Vol	0	6	0	0	467	0	172	0	21
RT Vol	0	0	70	0	389	0	27	0	64
Lane Flow Rate	98	6	75	51	920	348	214	101	91
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.26	0.016	0.175	0.119	1.955	0.801	0.458	0.266	0.214
Departure Headway (Hd)	11.528	10.999	10.259	8.465	7.647	9.941	9.341	11.447	10.357
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	314	327	352	426	488	366	389	316	349
Service Time	9.228	8.699	7.959	6.165	5.347	7.641	7.041	9.147	8.057
HCM Lane V/C Ratio	0.312	0.018	0.213	0.12	1.885	0.951	0.55	0.32	0.261
HCM Control Delay	18.2	13.9	15.1	12.3	455.2	42.6	19.7	18.2	15.9
HCM Lane LOS	C	B	C	B	F	E	C	C	C
HCM 95th-tile Q	1	0	0.6	0.4	61.8	6.9	2.3	1	0.8

HCM Signalized Intersection Capacity Analysis
30: Redwood Blvd & Novato Blvd 02/23/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	47	467	389	324	172	27	91	6	70	94	21	64
Future Volume (vph)	47	467	389	324	172	27	91	6	70	94	21	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	16	12	16	16	12	12	12	12	12	12
Total Lost time (s)	3.5	4.0		3.5	4.0		3.5	4.0	4.0	3.5	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.93		1.00	0.98		1.00	1.00	0.85	1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1787	1976		1787	2071		1787	1881	1599	1787	1669	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1787	1976		1787	2071		1787	1881	1599	1787	1669	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	49	492	409	341	181	28	96	6	74	99	22	67
RTOR Reduction (vph)	0	21	0	0	3	0	0	0	68	0	61	0
Lane Group Flow (vph)	49	880	0	341	206	0	96	6	6	99	28	0
Heavy Vehicles (%)	1%	2%	1%	1%	2%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	6.8	56.0		25.4	74.6		8.5	8.8	8.8	10.5	10.8	
Effective Green, g (s)	6.8	56.0		25.4	74.6		8.5	8.8	8.8	10.5	10.8	
Actuated g/C Ratio	0.06	0.48		0.22	0.64		0.07	0.08	0.08	0.09	0.09	
Clearance Time (s)	3.5	4.0		3.5	4.0		3.5	4.0	4.0	3.5	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	105	956		392	1335		131	143	121	162	155	
v/s Ratio Prot	0.03	c0.45		c0.19	0.10		c0.05	0.00		0.06	c0.02	
v/s Ratio Perm									0.00			
v/c Ratio	0.47	0.92		0.87	0.15		0.73	0.04	0.05	0.61	0.18	
Uniform Delay, d1	52.7	27.8		43.6	8.1		52.5	49.5	49.6	50.6	48.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.3	13.8		18.2	0.1		18.9	0.1	0.2	6.7	0.6	
Delay (s)	56.0	41.6		61.7	8.2		71.4	49.7	49.7	57.3	48.9	
Level of Service	E	D		E	A		E	D	D	E	D	
Approach Delay (s)		42.3			41.4			61.6			53.3	
Approach LOS		D			D			E			D	

Intersection Summary			
HCM 2000 Control Delay	45.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	115.7	Sum of lost time (s)	15.0
Intersection Capacity Utilization	88.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

MOVEMENT SUMMARY

Site: 30 [AM Existing + Project]

Novato Boulevard/Redwood Boulevard
AM Existing + Project

Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NB Redwood Boulevard											
3	L2	98	2.0	0.262	8.4	LOS A	1.1	28.4	0.65	0.65	31.9
8	T1	6	2.0	0.262	8.4	LOS A	1.1	28.4	0.65	0.65	31.8
18	R2	75	2.0	0.262	8.4	LOS A	1.1	28.4	0.65	0.65	31.0
Approach		180	2.0	0.262	8.4	LOS A	1.1	28.4	0.65	0.65	31.5
East: WB Novato Blvd											
1	L2	348	2.0	0.488	8.5	LOS A	3.3	84.1	0.48	0.31	31.7
6	T1	185	2.0	0.488	8.5	LOS A	3.3	84.1	0.48	0.31	31.7
16	R2	29	2.0	0.488	8.5	LOS A	3.3	84.1	0.48	0.31	30.9
Approach		562	2.0	0.488	8.5	LOS A	3.3	84.1	0.48	0.31	31.6
North: SB Redwood Boulevard											
7	L2	101	2.0	0.274	8.4	LOS A	1.2	30.1	0.64	0.64	31.9
4	T1	23	2.0	0.274	8.4	LOS A	1.2	30.1	0.64	0.64	31.9
14	R2	69	2.0	0.274	8.4	LOS A	1.2	30.1	0.64	0.64	31.1
Approach		192	2.0	0.274	8.4	LOS A	1.2	30.1	0.64	0.64	31.6
West: EB Novato Blvd											
5	L2	51	2.0	0.669	15.7	LOS B	6.6	167.9	0.74	0.98	29.9
2	T1	502	2.0	0.669	15.7	LOS B	6.6	167.9	0.74	0.98	29.8
12	R2	418	2.0	0.466	9.8	LOS A	2.9	74.3	0.64	0.69	31.5
Approach		971	2.0	0.669	13.1	LOS B	6.6	167.9	0.70	0.86	30.5
All Vehicles		1905	2.0	0.669	10.9	LOS B	6.6	167.9	0.62	0.65	31.0

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Organisation: W-TRANS | Processed: Tuesday, February 27, 2018 4:00:12 PM
Project: N:\AAA\MAX\NOV\126NOV\SIDRA\Novato-Redwood.sip7

HCM Signalized Intersection Capacity Analysis
31: Alameda Del Prado & Ignacio Blvd 02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	874	448	255	358	18	67	4	230	7	2	0
Future Volume (vph)	12	874	448	255	358	18	67	4	230	7	2	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.6	3.6	3.0	3.6			3.5	3.5		3.7	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00			1.00	0.98		1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00			0.99	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	0.99			1.00	0.85		1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00		0.96	
Satd. Flow (prot)	1770	3610	1573	1900	3584			1786	1589		1824	
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.73	1.00		0.85	
Satd. Flow (perm)	1770	3610	1573	1805	3584			1371	1589		1609	
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)	12	910	467	266	373	19	70	4	240	7	2	0
RTOR Reduction (vph)	0	0	86	0	2	0	0	0	208	0	0	0
Lane Group Flow (vph)	13	910	381	266	390	0	0	74	32	0	9	0
Confl. Peds. (#/hr)			4				7		4	4		7
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2				8		8	4		
Actuated Green, G (s)	1.3	49.3	49.3	27.4	75.4			13.2	13.2		13.0	
Effective Green, g (s)	1.3	49.3	49.3	27.4	75.4			13.2	13.2		13.0	
Actuated g/C Ratio	0.01	0.49	0.49	0.27	0.75			0.13	0.13		0.13	
Clearance Time (s)	3.0	3.6	3.6	3.0	3.6			3.5	3.5		3.7	
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0			2.0	2.0		2.0	
Lane Grp Cap (vph)	23	1779	775	520	2702			180	209		209	
v/s Ratio Prot	0.01	c0.25		c0.14	0.11							
v/s Ratio Perm			0.24					c0.05	0.02		0.01	
v/c Ratio	0.57	0.51	0.49	0.51	0.14			0.41	0.15		0.04	
Uniform Delay, d1	49.1	17.2	17.0	30.6	3.4			39.8	38.4		38.1	
Progression Factor	1.00	1.00	1.00	0.61	0.53			1.00	1.00		1.00	
Incremental Delay, d2	17.6	1.1	2.2	0.3	0.1			0.6	0.1		0.0	
Delay (s)	66.6	18.2	19.2	19.1	1.9			40.4	38.6		38.1	
Level of Service	E	B	B	B	A			D	D		D	
Approach Delay (s)		19.0			8.8			39.0			38.1	
Approach LOS		B			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	18.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.50		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.3
Intersection Capacity Utilization	62.9%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
32: US 101 SB Off Ramp/Enfrente Rd & Ignacio Blvd

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	841	307	200	428	41	0	0	1147	264	137	211
Future Volume (vph)	34	841	307	200	428	41	0	0	1147	264	137	211
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			2%			0%	
Total Lost time (s)	3.0	8.0	8.0	4.0	5.0				4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95				0.88		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.96	1.00	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	1.00	0.85	1.00	0.99				0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00				1.00		0.97	1.00
Satd. Flow (prot)	1805	3610	1550	1787	3546				2814		1809	1578
Flt Permitted	0.95	1.00	1.00	0.95	1.00				1.00		0.97	1.00
Satd. Flow (perm)	1805	3610	1550	1787	3546				2814		1809	1578
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)	35	876	320	208	446	43	0	0	1195	275	143	220
RTOR Reduction (vph)	0	0	134	0	6	0	0	0	324	0	0	158
Lane Group Flow (vph)	35	876	186	208	483	0	0	0	871	0	418	62
Confl. Peds. (#/hr)			7			20						1
Confl. Bikes (#/hr)						3						
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	5%	1%
Turn Type	Prot	NA	Perm	Prot	NA				Over	Split	NA	Perm
Protected Phases	5	2		1	6				1	7	7	
Permitted Phases			2									7
Actuated Green, G (s)	6.6	28.8	28.8	27.2	53.4				27.2		28.0	28.0
Effective Green, g (s)	6.6	28.8	28.8	27.2	53.4				27.2		28.0	28.0
Actuated g/C Ratio	0.07	0.29	0.29	0.27	0.53				0.27		0.28	0.28
Clearance Time (s)	3.0	8.0	8.0	4.0	5.0				4.0		4.0	4.0
Vehicle Extension (s)	2.0	2.5	2.5	3.0	4.0				3.0		2.5	2.5
Lane Grp Cap (vph)	119	1039	446	486	1893				765		506	441
v/s Ratio Prot	0.02	c0.24		0.12	0.14				c0.31		c0.23	
v/s Ratio Perm			0.12									0.04
v/c Ratio	0.29	0.84	0.42	0.43	0.26				1.14		0.83	0.14
Uniform Delay, d1	44.5	33.5	28.8	30.0	12.6				36.4		33.7	27.0
Progression Factor	0.90	0.67	0.47	1.58	1.87				1.00		1.00	1.00
Incremental Delay, d2	0.5	7.7	2.6	0.6	0.3				77.9		10.4	0.1
Delay (s)	40.7	30.2	16.0	47.8	23.8				114.3		44.1	27.1
Level of Service	D	C	B	D	C				F		D	C
Approach Delay (s)		26.8			31.0			114.3			38.2	
Approach LOS		C			C			F			D	

Intersection Summary				
HCM 2000 Control Delay	57.3	HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio	0.93			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	98.7%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
32: US 101 SB Off Ramp/Enfrente Rd & Ignacio Blvd

02/23/2018

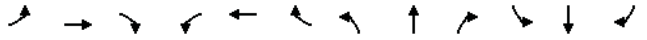
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	841	307	200	428	41	0	0	1147	264	137	211
Future Volume (vph)	34	841	307	200	428	41	0	0	1147	264	137	211
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			2%			0%	
Total Lost time (s)	3.0	8.0	8.0	4.0	5.0				4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95				0.88		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.96	1.00	0.99				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	1.00	0.85	1.00	0.99				0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00				1.00		0.97	1.00
Satd. Flow (prot)	1805	3610	1546	1787	3544				2814		1809	1578
Flt Permitted	0.95	1.00	1.00	0.95	1.00				1.00		0.97	1.00
Satd. Flow (perm)	1805	3610	1546	1787	3544				2814		1809	1578
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)	35	876	320	208	446	43	0	0	1195	275	143	220
RTOR Reduction (vph)	0	0	130	0	6	0	0	0	184	0	0	164
Lane Group Flow (vph)	35	876	190	208	483	0	0	0	1011	0	418	56
Confl. Peds. (#/hr)			7			20						1
Confl. Bikes (#/hr)						3						
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	5%	1%
Turn Type	Prot	NA	Perm	Prot	NA				Over	Split	NA	Perm
Protected Phases	5	2		1	6				1	7	7	
Permitted Phases			2									7
Actuated Green, G (s)	3.6	28.0	28.0	39.3	67.7				39.3		28.7	28.7
Effective Green, g (s)	3.6	28.0	28.0	39.3	67.7				39.3		28.7	28.7
Actuated g/C Ratio	0.03	0.25	0.25	0.35	0.60				0.35		0.26	0.26
Clearance Time (s)	3.0	8.0	8.0	4.0	5.0				4.0		4.0	4.0
Vehicle Extension (s)	2.0	4.0	4.0	3.0	4.0				3.0		2.5	2.5
Lane Grp Cap (vph)	58	902	386	627	2142				987		463	404
v/s Ratio Prot	0.02	c0.24		0.12	0.14				c0.36		c0.23	
v/s Ratio Perm			0.12									0.04
v/c Ratio	0.60	0.97	0.49	0.33	0.23				1.02		0.90	0.14
Uniform Delay, d1	53.5	41.6	35.9	26.7	10.1				36.4		40.3	32.1
Progression Factor	1.28	0.75	0.65	0.71	0.36				1.00		1.00	1.00
Incremental Delay, d2	10.9	22.9	4.2	0.3	0.2				34.9		20.6	0.1
Delay (s)	79.4	54.3	27.4	19.1	3.9				71.2		60.9	32.2
Level of Service	E	D	C	B	A				E		E	C
Approach Delay (s)		48.0			8.5			71.2			51.0	
Approach LOS		D			A			E			D	

Intersection Summary				
HCM 2000 Control Delay	48.6	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.97			
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	98.7%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
33: Nave Dr & Ignacio Blvd/Bel Marin Keys Blvd

02/15/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	955	1293	101	229	228	443	526	683	0	0	0
Future Volume (vph)	0	955	1293	101	229	228	443	526	683	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.6	3.0	4.0		4.6	4.6	3.0			
Lane Util. Factor		0.95	1.00	1.00	0.95		0.91	0.91	1.00			
Frpb, ped/bikes		1.00	1.00	1.00	0.99		1.00	1.00	0.99			
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00			
Frt		1.00	0.85	1.00	0.93		1.00	1.00	0.85			
Flt Protected		1.00	1.00	0.95	1.00		0.95	0.99	1.00			
Satd. Flow (prot)		3610	1607	1805	3285		1643	3397	1599			
Flt Permitted		1.00	1.00	0.95	1.00		0.95	0.99	1.00			
Satd. Flow (perm)		3610	1607	1805	3285		1643	3397	1599			
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)	0	1016	1376	107	244	243	471	560	727	0	0	0
RTOR Reduction (vph)	0	0	81	0	134	0	0	0	4	0	0	0
Lane Group Flow (vph)	0	1016	1295	107	353	0	334	697	723	0	0	0
Confl. Peds. (#/hr)			1			1			1			
Heavy Vehicles (%)	0%	0%	0%	0%	0%	2%	0%	1%	0%	0%	0%	0%
Turn Type		NA	pm+ov	Prot	NA		Split	NA	pm+ov			
Protected Phases		2	3	1	6		3	3	1			
Permitted Phases			2						3			
Actuated Green, G (s)		28.4	76.4	12.0	43.4		48.0	48.0	60.0			
Effective Green, g (s)		28.4	76.4	12.0	43.4		48.0	48.0	60.0			
Actuated g/C Ratio		0.28	0.76	0.12	0.43		0.48	0.48	0.60			
Clearance Time (s)		4.0	4.6	3.0	4.0		4.6	4.6	3.0			
Vehicle Extension (s)		4.0	2.0	2.0	4.0		2.0	2.0	2.0			
Lane Grp Cap (vph)		1025	1227	216	1425		788	1630	959			
v/s Ratio Prot		0.28	c0.51	0.06	0.11		0.20	0.21	c0.09			
v/s Ratio Perm			0.30						0.36			
v/c Ratio		0.99	1.06	0.50	0.25		0.42	0.43	0.75			
Uniform Delay, d1		35.7	11.8	41.2	17.9		17.0	17.0	14.6			
Progression Factor		0.98	1.26	1.20	0.90		1.00	1.00	1.00			
Incremental Delay, d2		14.7	32.5	0.6	0.4		0.1	0.1	3.0			
Delay (s)		49.8	47.4	50.1	16.6		17.1	17.1	17.6			
Level of Service		D	D	D	B		B	B	B			
Approach Delay (s)		48.4			22.6			17.3			0.0	
Approach LOS		D			C			B			A	

Intersection Summary				
HCM 2000 Control Delay	33.7	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	1.01			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.6	
Intersection Capacity Utilization	97.3%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
34: Bel Marin Keys Blvd & Commercial Blvd

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	11	73	0	9	46	1369	230	12	466	1
Future Volume (vph)	0	0	11	73	0	9	46	1369	230	12	466	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	3.0	3.9		3.0	3.5	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.86			1.00	0.85	1.00	0.98		1.00	1.00	
Flt Protected		1.00			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1620			1801	1395	1805	3518		1805	3573	
Flt Permitted		1.00			0.75	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1620			1421	1395	1805	3518		1805	3573	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	12	77	0	9	48	1441	242	13	491	1
RTOR Reduction (vph)	0	11	0	0	0	8	0	7	0	0	0	0
Lane Group Flow (vph)	0	1	0	0	77	1	48	1676	0	13	492	0
Confl. Peds. (#/hr)	3		2	2		3			3			
Heavy Vehicles (%)	2%	0%	0%	0%	0%	14%	0%	0%	0%	0%	1%	0%
Turn Type		NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		12.1			12.1	12.1	5.3	75.2		1.8	72.1	
Effective Green, g (s)		12.1			12.1	12.1	5.3	75.2		1.8	72.1	
Actuated g/C Ratio		0.12			0.12	0.12	0.05	0.75		0.02	0.72	
Clearance Time (s)		4.0			4.0	4.0	3.0	3.9		3.0	3.5	
Vehicle Extension (s)		3.0			3.0	3.0	2.5	3.0		2.5	4.0	
Lane Grp Cap (vph)		196			171	168	95	2645		32	2576	
v/s Ratio Prot		0.00					c0.03	c0.48		0.01	0.14	
v/s Ratio Perm					c0.05	0.00						
v/c Ratio		0.01			0.45	0.01	0.51	0.63		0.41	0.19	
Uniform Delay, d1		38.7			40.9	38.7	46.1	5.9		48.6	4.5	
Progression Factor		1.00			1.00	1.00	0.93	0.78		0.93	1.31	
Incremental Delay, d2		0.0			1.9	0.0	1.4	0.5		6.0	0.2	
Delay (s)		38.7			42.7	38.7	44.2	5.1		51.1	6.1	
Level of Service		D			D	D	D	A		D	A	
Approach Delay (s)		38.7			42.3			6.2			7.3	
Approach LOS		D			D			A			A	

Intersection Summary				
HCM 2000 Control Delay	7.9	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.62			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.9	
Intersection Capacity Utilization	68.1%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
35: Bel Marin Keys Blvd & Hamilton Dr/Digital Dr 02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1	46	98	2	9	104	678	595	9	336	3
Future Volume (vph)	0	1	46	98	2	9	104	678	595	9	336	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	3.5	3.5	3.5		3.0	4.0		3.0	4.0	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.99	1.00	0.99		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	0.85	1.00	0.88		1.00	0.93		1.00	1.00	
Flt Protected		1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1900	1533	1803	1649		1770	3320		1805	3569	
Flt Permitted		1.00	1.00	0.76	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1900	1533	1437	1649		1770	3320		1805	3569	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1	48	103	2	9	109	714	626	9	354	3
RTOR Reduction (vph)	0	0	42	0	8	0	0	77	0	0	0	0
Lane Group Flow (vph)	0	1	6	103	3	0	109	1263	0	9	357	0
Confl. Peds. (#/hr)	1		1	1		1			2			8
Heavy Vehicles (%)	0%	0%	4%	0%	0%	0%	2%	0%	0%	0%	1%	0%
Turn Type		NA	Perm	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8								
Actuated Green, G (s)		13.0	13.0	13.0	13.0		11.2	74.7		1.8	65.3	
Effective Green, g (s)		13.0	13.0	13.0	13.0		11.2	74.7		1.8	65.3	
Actuated g/C Ratio		0.13	0.13	0.13	0.13		0.11	0.75		0.02	0.65	
Clearance Time (s)		3.5	3.5	3.5	3.5		3.0	4.0		3.0	4.0	
Vehicle Extension (s)		2.0	2.0	2.5	2.5		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)		247	199	186	214		198	2480		32	2330	
v/s Ratio Prot		0.00			0.00		c0.06	c0.38		0.00	0.10	
v/s Ratio Perm			0.00	c0.07								
v/c Ratio		0.00	0.03	0.55	0.01		0.55	0.51		0.28	0.15	
Uniform Delay, d1		37.9	38.0	40.8	37.9		42.0	5.2		48.5	6.7	
Progression Factor		1.00	1.00	1.00	1.00		1.02	1.35		1.00	1.00	
Incremental Delay, d2		0.0	0.0	2.8	0.0		1.5	0.6		1.8	0.1	
Delay (s)		37.9	38.0	43.6	37.9		44.5	7.6		50.2	6.8	
Level of Service		D	D	D	D		D	A		D	A	
Approach Delay (s)		38.0			43.1			10.4			7.9	
Approach LOS		D			D			B			A	

Intersection Summary				
HCM 2000 Control Delay	12.5	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.53			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.5	
Intersection Capacity Utilization	67.8%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
36: Nave Dr & US 101 NB Off Ramp 02/15/2018

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	776	174	0	876	1192	188
Future Volume (vph)	776	174	0	876	1192	188
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		5.0	5.0	
Lane Util. Factor	0.97	1.00		0.95	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	0.98	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3467	1563		3574	3506	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3467	1563		3574	3506	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	843	189	0	952	1296	204
RTOR Reduction (vph)	0	20	0	0	18	0
Lane Group Flow (vph)	843	169	0	952	1482	0
Confl. Peds. (#/hr)		1				
Heavy Vehicles (%)	1%	2%	0%	1%	1%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	27.0	27.0		35.0	35.0	
Effective Green, g (s)	27.0	27.0		35.0	35.0	
Actuated g/C Ratio	0.39	0.39		0.50	0.50	
Clearance Time (s)	3.0	3.0		5.0	5.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	1337	602		1787	1753	
v/s Ratio Prot	c0.24			0.27	c0.42	
v/s Ratio Perm		0.11				
v/c Ratio	0.63	0.28		0.53	0.85	
Uniform Delay, d1	17.5	14.8		11.9	15.2	
Progression Factor	1.00	1.00		0.36	1.00	
Incremental Delay, d2	2.3	1.2		1.0	5.2	
Delay (s)	19.7	16.0		5.3	20.4	
Level of Service	B	B		A	C	
Approach Delay (s)	19.0			5.3	20.4	
Approach LOS	B			A	C	

Intersection Summary			
HCM 2000 Control Delay	15.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	68.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
37: Nave Dr & Hamilton Center

02/15/2018

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	38	20	713	82	97	1117
Future Volume (vph)	38	20	713	82	97	1117
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.2	3.2	4.4		3.0	4.4
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	1615	1869		1770	1881
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1805	1615	1869		1770	1881
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	42	22	784	90	107	1227
RTOR Reduction (vph)	0	21	5	0	0	0
Lane Group Flow (vph)	42	1	869	0	107	1227
Confl. Peds. (#/hr)				2		
Heavy Vehicles (%)	0%	0%	0%	0%	2%	1%
Turn Type	Prot	Perm	NA		Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8				
Actuated Green, G (s)	3.6	3.6	48.6		7.2	58.8
Effective Green, g (s)	3.6	3.6	48.6		7.2	58.8
Actuated g/C Ratio	0.05	0.05	0.69		0.10	0.84
Clearance Time (s)	3.2	3.2	4.4		3.0	4.4
Vehicle Extension (s)	1.0	1.0	1.0		1.0	1.0
Lane Grp Cap (vph)	92	83	1297		182	1580
v/s Ratio Prot	c0.02		0.47		0.06	c0.65
v/s Ratio Perm		0.00				
v/c Ratio	0.46	0.01	0.67		0.59	0.78
Uniform Delay, d1	32.2	31.5	6.1		30.0	2.6
Progression Factor	1.00	1.00	0.75		1.28	1.58
Incremental Delay, d2	1.3	0.0	2.2		1.9	2.3
Delay (s)	33.6	31.5	6.8		40.4	6.4
Level of Service	C	C	A		D	A
Approach Delay (s)	32.9		6.8			9.1
Approach LOS	C		A			A

Intersection Summary				
HCM 2000 Control Delay	8.9	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.80			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	10.6	
Intersection Capacity Utilization	70.8%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
38: Nave Dr & Hamilton Pkwy

02/15/2018

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	119	271	494	41	358	764
Future Volume (vph)	119	271	494	41	358	764
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.2	3.2	4.4	4.4	3.0	4.4
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1599	1900	1578	1787	1850
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1599	1900	1578	1787	1900
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	131	298	543	45	393	840
RTOR Reduction (vph)	0	257	0	13	0	0
Lane Group Flow (vph)	131	41	543	32	393	840
Confl. Peds. (#/hr)				2		
Heavy Vehicles (%)	2%	1%	0%	0%	1%	0%
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Actuated Green, G (s)	9.7	9.7	25.4	25.4	24.3	52.7
Effective Green, g (s)	9.7	9.7	25.4	25.4	24.3	52.7
Actuated g/C Ratio	0.14	0.14	0.36	0.36	0.35	0.75
Clearance Time (s)	3.2	3.2	4.4	4.4	3.0	4.4
Vehicle Extension (s)	2.0	2.0	3.0	3.0	2.0	3.0
Lane Grp Cap (vph)	245	221	689	572	620	1392
v/s Ratio Prot	c0.07		c0.29		c0.22	0.45
v/s Ratio Perm		0.03		0.02		
v/c Ratio	0.53	0.19	0.79	0.06	0.63	0.60
Uniform Delay, d1	28.1	26.7	19.9	14.5	19.1	3.9
Progression Factor	1.00	1.00	1.00	1.00	1.25	0.67
Incremental Delay, d2	1.1	0.1	8.9	0.2	1.1	1.3
Delay (s)	29.2	26.8	28.8	14.7	24.9	3.9
Level of Service	C	C	C	B	C	A
Approach Delay (s)	27.5		27.7			10.6
Approach LOS	C		C			B

Intersection Summary				
HCM 2000 Control Delay	18.3	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.68			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	10.6	
Intersection Capacity Utilization	62.8%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
39: Nave Dr & Main Gate Dr

02/15/2018

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	264	182	230	459	293	336
Future Volume (vph)	264	182	230	459	293	336
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	4.1	4.1	3.0	4.4
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1805	1615	1900	1615	1805	1881
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1805	1615	1900	1615	1805	1881
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	284	196	247	494	315	361
RTOR Reduction (vph)	0	147	0	368	0	0
Lane Group Flow (vph)	284	49	247	126	315	361
Heavy Vehicles (%)	0%	0%	0%	0%	0%	1%
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Actuated Green, G (s)	11.4	11.4	11.5	11.5	12.2	26.4
Effective Green, g (s)	11.4	11.4	11.5	11.5	12.2	26.4
Actuated g/C Ratio	0.25	0.25	0.25	0.25	0.27	0.58
Clearance Time (s)	3.0	3.0	4.1	4.1	3.0	4.4
Vehicle Extension (s)	2.0	2.0	1.0	1.0	1.0	1.0
Lane Grp Cap (vph)	455	407	483	410	487	1098
v/s Ratio Prot	c0.16		c0.13		c0.17	0.19
v/s Ratio Perm		0.03		0.08		
v/c Ratio	0.62	0.12	0.51	0.31	0.65	0.33
Uniform Delay, d1	15.0	13.0	14.4	13.6	14.6	4.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.9	0.0	0.4	0.2	2.2	0.1
Delay (s)	16.9	13.1	14.8	13.8	16.8	4.9
Level of Service	B	B	B	B	B	A
Approach Delay (s)	15.4		14.1			10.5
Approach LOS	B		B			B

Intersection Summary				
HCM 2000 Control Delay	13.1	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.59			
Actuated Cycle Length (s)	45.2	Sum of lost time (s)	10.1	
Intersection Capacity Utilization	53.0%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
40: Nave Dr & Bolling Dr

02/15/2018

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	336	110	521	98	83	530
Future Volume (vph)	336	110	521	98	83	530
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	4.1		3.0	3.5
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	0.97	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.98		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1787	1571	1844		1805	1881
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1787	1571	1844		1805	1881
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	369	121	573	108	91	582
RTOR Reduction (vph)	0	86	9	0	0	0
Lane Group Flow (vph)	369	35	672	0	91	582
Confl. Peds. (#/hr)		6				
Heavy Vehicles (%)	1%	0%	1%	0%	0%	1%
Turn Type	Prot	Perm	NA		Prot	NA
Protected Phases	4		6		5	2
Permitted Phases		4				
Actuated Green, G (s)	17.5	17.5	25.9		6.4	35.9
Effective Green, g (s)	17.5	17.5	25.9		6.4	35.9
Actuated g/C Ratio	0.29	0.29	0.43		0.11	0.60
Clearance Time (s)	3.0	3.0	4.1		3.0	3.5
Vehicle Extension (s)	2.0	2.0	2.0		2.0	2.0
Lane Grp Cap (vph)	522	458	797		192	1127
v/s Ratio Prot	c0.21		c0.36		0.05	c0.31
v/s Ratio Perm		0.02				
v/c Ratio	0.71	0.08	0.84		0.47	0.52
Uniform Delay, d1	18.9	15.4	15.2		25.2	7.0
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	3.6	0.0	7.8		0.7	0.2
Delay (s)	22.5	15.4	23.0		25.8	7.1
Level of Service	C	B	C		C	A
Approach Delay (s)	20.7		23.0			9.7
Approach LOS	C		C			A

Intersection Summary				
HCM 2000 Control Delay	17.5	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.76			
Actuated Cycle Length (s)	59.9	Sum of lost time (s)	10.1	
Intersection Capacity Utilization	69.8%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Intersection	
Intersection Delay, s/veh	32.1
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	125	11	0	63	117	618	2	157	43	109	21	6
Future Vol, veh/h	125	11	0	63	117	618	2	157	43	109	21	6
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	132	12	0	66	123	651	2	165	45	115	22	6
Number of Lanes	0	1	0	0	1	1	0	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	2	1
HCM Control Delay	13.3	42.8	15.5	13.1
HCM LOS	B	E	C	B

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	1%	92%	35%	0%	100%	0%
Vol Thru, %	78%	8%	65%	0%	0%	78%
Vol Right, %	21%	0%	0%	100%	0%	22%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	202	136	180	618	109	27
LT Vol	2	125	63	0	109	0
Through Vol	157	11	117	0	0	21
RT Vol	43	0	0	618	0	6
Lane Flow Rate	213	143	189	651	115	28
Geometry Grp	6	6	7	7	7	7
Degree of Util (X)	0.427	0.29	0.33	0.974	0.259	0.059
Departure Headway (Hd)	7.221	7.304	6.279	5.392	8.116	7.444
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	502	492	568	664	444	483
Service Time	5.221	5.333	4.075	3.187	5.832	5.159
HCM Lane V/C Ratio	0.424	0.291	0.333	0.98	0.259	0.058
HCM Control Delay	15.5	13.3	12.2	51.7	13.7	10.6
HCM Lane LOS	C	B	B	F	B	B
HCM 95th-tile Q	2.1	1.2	1.4	14.5	1	0.2

HCM 2010 AWSC
1: Simmons Ln & San Marin Dr 02/15/2018

Intersection	
Intersection Delay, s/veh	101.8
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	12	449	96	320	944	32	112	16	158	19	12	12
Future Vol, veh/h	12	449	96	320	944	32	112	16	158	19	12	12
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	13	473	101	337	994	34	118	17	166	20	13	13
Number of Lanes	1	2	0	1	2	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	3	3
HCM Control Delay	36.3	150.4	22.1	16.9
HCM LOS	E	F	C	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1
Vol Left, %	88%	0%	100%	0%	0%	100%	0%	0%	44%
Vol Thru, %	12%	0%	0%	100%	61%	0%	100%	91%	28%
Vol Right, %	0%	100%	0%	0%	39%	0%	0%	9%	28%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	128	158	12	299	246	320	629	347	43
LT Vol	112	0	12	0	0	320	0	0	19
Through Vol	16	0	0	299	150	0	629	315	12
RT Vol	0	158	0	0	96	0	0	32	12
Lane Flow Rate	135	166	13	315	259	337	662	365	45
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.407	0.45	0.034	0.81	0.645	0.821	1.519	0.83	0.143
Departure Headway (Hd)	11.801	10.639	10.472	9.956	9.673	8.772	8.256	8.19	12.205
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	307	341	344	366	375	414	444	442	296
Service Time	9.501	8.339	8.172	7.656	7.373	6.515	5.999	5.933	9.905
HCM Lane V/C Ratio	0.44	0.487	0.038	0.861	0.691	0.814	1.491	0.826	0.152
HCM Control Delay	22.4	21.8	13.5	43.8	28.3	41.1	266.7	40	16.9
HCM Lane LOS	C	C	B	E	D	E	F	E	C
HCM 95th-tile Q	1.9	2.2	0.1	7	4.3	7.5	35.2	7.9	0.5

HCM Signalized Intersection Capacity Analysis
1: Simmons Ln & San Marin Dr 02/16/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	449	96	320	944	32	112	16	158	19	12	12
Future Volume (vph)	12	449	96	320	944	32	112	16	158	19	12	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.98	
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583		1785	1583		1754	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.72	1.00		0.86	
Satd. Flow (perm)	1770	1863	1583	1770	1863	1583		1341	1583		1544	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	13	473	101	337	994	34	118	17	166	20	13	13
RTOR Reduction (vph)	0	0	62	0	0	12	0	0	92	0	11	0
Lane Group Flow (vph)	13	473	39	337	994	22	0	135	74	0	35	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	pm+ov	Perm	NA	
Protected Phases	7	4		3	8			2	3		6	
Permitted Phases			4			8	2		2	6		
Actuated Green, G (s)	0.6	27.2	27.2	18.2	44.8	44.8		13.4	31.6		13.4	
Effective Green, g (s)	0.6	27.2	27.2	18.2	44.8	44.8		13.4	31.6		13.4	
Actuated g/C Ratio	0.01	0.38	0.38	0.26	0.63	0.63		0.19	0.45		0.19	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	
Lane Grp Cap (vph)	15	715	608	455	1178	1001		253	795		292	
v/s Ratio Prot	0.01	0.25		c0.19	c0.53				0.02			
v/s Ratio Perm			0.02			0.01		c0.10	0.02		0.02	
v/c Ratio	0.87	0.66	0.06	0.74	0.84	0.02		0.53	0.09		0.12	
Uniform Delay, d1	35.1	18.0	13.8	24.1	10.2	4.8		25.9	11.3		23.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2	162.9	2.3	0.0	6.4	5.7	0.0		2.2	0.1		0.2	
Delay (s)	198.0	20.3	13.8	30.5	15.9	4.8		28.0	11.4		24.0	
Level of Service	F	C	B	C	B	A		C	B		C	
Approach Delay (s)		23.1			19.3			18.8			24.0	
Approach LOS		C			B			B			C	

Intersection Summary			
HCM 2000 Control Delay	20.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	70.8	Sum of lost time (s)	12.0
Intersection Capacity Utilization	75.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

MOVEMENT SUMMARY

Site: 1 [PM E+P]

Simmons Lane/San Marin Drive
PM Existing plus Project

Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NB Simmons Ln											
3	L2	118	2.0	0.376	9.1	LOS A	1.9	48.3	0.65	0.65	31.9
8	T1	17	2.0	0.376	9.1	LOS A	1.9	48.3	0.65	0.65	31.9
18	R2	166	2.0	0.376	9.1	LOS A	1.9	48.3	0.65	0.65	31.1
Approach		301	2.0	0.376	9.1	LOS A	1.9	48.3	0.65	0.65	31.4
East: WB San Marin Drive											
1	L2	337	2.0	0.277	5.5	LOS A	1.4	34.3	0.33	0.20	32.1
6	T1	994	2.0	0.846	20.8	LOS C	26.2	666.4	0.90	0.91	28.0
16	R2	34	2.0	0.846	20.8	LOS C	26.2	666.4	0.90	0.91	27.4
Approach		1364	2.0	0.846	17.0	LOS B	26.2	666.4	0.76	0.73	28.9
North: SB Simmons Ln											
7	L2	20	2.0	0.114	10.8	LOS B	0.4	9.1	0.74	0.74	31.0
4	T1	13	2.0	0.114	10.8	LOS B	0.4	9.1	0.74	0.74	31.0
14	R2	13	2.0	0.114	10.8	LOS B	0.4	9.1	0.74	0.74	30.3
Approach		45	2.0	0.114	10.8	LOS B	0.4	9.1	0.74	0.74	30.8
West: EB San Marin Drive											
5	L2	13	2.0	0.636	13.7	LOS B	7.3	184.4	0.77	0.90	30.8
2	T1	473	2.0	0.636	13.7	LOS B	7.3	184.4	0.77	0.90	30.8
12	R2	101	2.0	0.636	13.7	LOS B	7.3	184.4	0.77	0.90	30.0
Approach		586	2.0	0.636	13.7	LOS B	7.3	184.4	0.77	0.90	30.6
All Vehicles		2297	2.0	0.846	15.0	LOS B	26.2	666.4	0.75	0.76	29.7

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Organisation: W-TRANS | Processed: Tuesday, February 27, 2018 3:49:19 PM
Project: N:\AAA\MAX\NOV\126NOV\SIDRA\Simmons-San Marin.sip7

HCM Signalized Intersection Capacity Analysis
2: W Campus Dr & San Marin Dr 02/15/2018

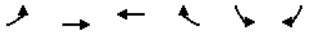
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	664	0	3	1318	15	0	0	0	67	0	8
Future Volume (vph)	3	664	0	3	1318	15	0	0	0	67	0	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.8		4.0	4.8	4.8				4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00				0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00				1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00				1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85				1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00				0.95	0.95	1.00
Satd. Flow (prot)	1805	3574		1805	3574	1615				1715	1715	1615
Flt Permitted	0.95	1.00		0.95	1.00	1.00				0.82	0.82	1.00
Satd. Flow (perm)	1805	3574		1805	3574	1615				1473	1473	1615
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	3	699	0	3	1387	16	0	0	0	71	0	8
RTOR Reduction (vph)	0	0	0	0	0	6	0	0	0	0	0	7
Lane Group Flow (vph)	3	699	0	3	1387	10	0	0	0	35	36	1
Confl. Peds. (#/hr)			2									
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA	Perm				Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8			4		4
Actuated Green, G (s)	1.3	30.4		1.2	30.3	30.3				4.9	4.9	4.9
Effective Green, g (s)	1.3	30.4		1.2	30.3	30.3				4.9	4.9	4.9
Actuated g/C Ratio	0.03	0.62		0.02	0.61	0.61				0.10	0.10	0.10
Clearance Time (s)	4.0	4.8		4.0	4.8	4.8				4.0	4.0	4.0
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0				2.0	2.0	2.0
Lane Grp Cap (vph)	47	2203		43	2196	992				146	146	160
v/s Ratio Prot	c0.00	0.20		0.00	c0.39							
v/s Ratio Perm						0.01				0.02	c0.02	0.00
v/c Ratio	0.06	0.32		0.07	0.63	0.01				0.24	0.25	0.00
Uniform Delay, d1	23.4	4.5		23.5	6.0	3.7				20.5	20.5	20.0
Progression Factor	1.00	1.00		1.00	1.00	1.00				1.00	1.00	1.00
Incremental Delay, d2	0.2	0.1		0.3	0.7	0.0				0.3	0.3	0.0
Delay (s)	23.6	4.6		23.8	6.7	3.7				20.8	20.8	20.0
Level of Service	C	A		C	A	A				C	C	C
Approach Delay (s)		4.7			6.7			0.0			20.7	
Approach LOS		A			A			A			C	

Intersection Summary			
HCM 2000 Control Delay	6.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	49.3	Sum of lost time (s)	12.8
Intersection Capacity Utilization	52.1%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: San Marin Dr & E Campus Drive

02/15/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	1	737	1341	47	49	3
Future Volume (vph)	1	737	1341	47	49	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.3	4.3	4.3	3.0	3.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1805	3574	3574	1615	3502	1595
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1805	3574	3574	1615	3502	1595
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	1	768	1397	49	51	3
RTOR Reduction (vph)	0	0	0	16	0	3
Lane Group Flow (vph)	1	768	1397	33	51	0
Confl. Peds. (#/hr)						1
Heavy Vehicles (%)	0%	1%	1%	0%	0%	0%
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Actuated Green, G (s)	1.0	38.5	34.5	34.5	5.6	5.6
Effective Green, g (s)	1.0	38.5	34.5	34.5	5.6	5.6
Actuated g/C Ratio	0.02	0.75	0.67	0.67	0.11	0.11
Clearance Time (s)	3.0	4.3	4.3	4.3	3.0	3.0
Vehicle Extension (s)	2.0	4.0	4.0	4.0	2.0	2.0
Lane Grp Cap (vph)	35	2677	2398	1083	381	173
v/s Ratio Prot	0.00	c0.21	c0.39		c0.01	
v/s Ratio Perm				0.02		0.00
v/c Ratio	0.03	0.29	0.58	0.03	0.13	0.00
Uniform Delay, d1	24.7	2.1	4.6	2.8	20.7	20.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.1	0.4	0.0	0.1	0.0
Delay (s)	24.8	2.1	5.0	2.9	20.8	20.4
Level of Service	C	A	A	A	C	C
Approach Delay (s)		2.2	4.9		20.7	
Approach LOS		A	A		C	

Intersection Summary				
HCM 2000 Control Delay	4.4	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.52			
Actuated Cycle Length (s)	51.4	Sum of lost time (s)	10.3	
Intersection Capacity Utilization	49.7%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
4: Redwood Blvd & San Marin Dr

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	602	178	386	955	205	291	95	518	630	150	100
Future Volume (vph)	29	602	178	386	955	205	291	95	518	630	150	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.6		3.0	4.0		4.3	4.3	4.3	4.3	4.3	
Lane Util. Factor	1.00	0.91		1.00	0.91		0.97	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	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	1.00	
Frt	1.00	0.97		1.00	0.97		1.00	1.00	0.85	1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1787	4943		1752	4999		3467	1881	1568	1787	1756	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1787	4943		1752	4999		3467	1881	1568	1787	1756	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	31	634	187	406	1005	216	306	100	545	663	158	105
RTOR Reduction (vph)	0	43	0	0	27	0	0	0	209	0	19	0
Lane Group Flow (vph)	31	778	0	406	1194	0	306	100	336	663	244	0
Confl. Peds. (#/hr)			4									5
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	1%	1%	1%	3%	1%	1%	1%	1%	3%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA		Split	NA	Perm	Split	NA	
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases					2				7			
Actuated Green, G (s)	6.0	40.0		14.2	47.8		16.9	16.9	16.9	43.7	43.7	
Effective Green, g (s)	6.0	40.0		14.2	47.8		16.9	16.9	16.9	43.7	43.7	
Actuated g/C Ratio	0.05	0.31		0.11	0.37		0.13	0.13	0.13	0.34	0.34	
Clearance Time (s)	3.0	3.6		3.0	4.0		4.3	4.3	4.3	4.3	4.3	
Vehicle Extension (s)	2.0	4.0		5.0	4.0		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	82	1520		191	1838		450	244	203	600	590	
v/s Ratio Prot	0.02	c0.16		c0.23	c0.24		0.09	0.05		c0.37	0.14	
v/s Ratio Perm									c0.21			
v/c Ratio	0.38	0.51		2.13	0.65		0.68	0.41	1.66	1.10	0.41	
Uniform Delay, d1	60.2	37.0		57.9	34.1		54.0	52.0	56.5	43.1	33.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.1	0.4		523.8	1.8		3.4	0.4	316.2	68.9	0.2	
Delay (s)	61.3	37.4		581.7	35.9		57.3	52.4	372.7	112.1	33.5	
Level of Service	E	D		F	D		E	D	F	F	C	
Approach Delay (s)		38.2			172.1			237.6			89.7	
Approach LOS		D			F			F			F	

Intersection Summary				
HCM 2000 Control Delay	142.7	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	1.15			
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	15.6	
Intersection Capacity Utilization	96.8%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
4: Redwood Blvd & San Marin Dr 02/16/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	602	178	386	955	205	291	95	518	630	150	100
Future Volume (vph)	29	602	178	386	955	205	291	95	518	630	150	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.6		3.0	4.0	4.3	4.3	4.3	3.0	4.3	4.3	
Lane Util. Factor	1.00	0.91		0.97	0.95	1.00	0.95	0.95	0.88	0.91	0.91	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	0.98	1.00	0.95	0.97	
Satd. Flow (prot)	1787	4942		3400	3574	1599	1698	1743	2760	1626	3233	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	0.98	1.00	0.95	0.97	
Satd. Flow (perm)	1787	4942		3400	3574	1599	1698	1743	2760	1626	3233	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	31	634	187	406	1005	216	306	100	545	663	158	105
RTOR Reduction (vph)	0	35	0	0	0	64	0	0	87	0	14	0
Lane Group Flow (vph)	31	786	0	406	1005	152	202	204	458	331	581	0
Confl. Peds. (#/hr)			4									5
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	1%	1%	1%	3%	1%	1%	1%	1%	3%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA	pm+ov	Split	NA	
Protected Phases	5	2		1	6	4	8	8	1	4	4	
Permitted Phases						6			8			
Actuated Green, G (s)	6.0	51.7		19.2	64.5	98.2	20.2	20.2	39.4	33.7	33.7	
Effective Green, g (s)	6.0	51.7		19.2	64.5	98.2	20.2	20.2	39.4	33.7	33.7	
Actuated g/C Ratio	0.04	0.37		0.14	0.46	0.70	0.14	0.14	0.28	0.24	0.24	
Clearance Time (s)	3.0	3.6		3.0	4.0	4.3	4.3	4.3	3.0	4.3	4.3	
Vehicle Extension (s)	2.0	4.0		5.0	4.0	2.0	2.0	2.0	5.0	2.0	2.0	
Lane Grp Cap (vph)	76	1825		466	1646	1121	244	251	776	391	778	
v/s Ratio Prot	0.02	c0.16		c0.12	c0.28	0.03	c0.12	0.12	0.08	c0.20	0.18	
v/s Ratio Perm						0.06			0.09			
v/c Ratio	0.41	0.43		0.87	0.61	0.14	0.83	0.81	0.59	0.85	0.75	
Uniform Delay, d1	65.3	33.1		59.2	28.3	6.9	58.2	58.1	43.3	50.7	49.2	
Progression Factor	1.00	1.00		0.77	0.58	2.01	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.3	0.7		15.9	1.5	0.0	19.2	17.0	1.8	14.9	3.5	
Delay (s)	66.6	33.9		61.8	17.8	13.9	77.4	75.1	45.2	65.6	52.7	
Level of Service	E	C		E	B	B	E	E	D	E	D	
Approach Delay (s)		35.0			28.3			58.4			57.3	
Approach LOS		D			C			E			E	

Intersection Summary				
HCM 2000 Control Delay	42.3	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.73			
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.6	
Intersection Capacity Utilization	92.3%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

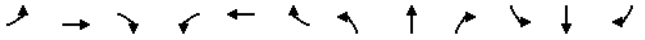
HCM Signalized Intersection Capacity Analysis
5: US 101 SB Ramps & San Marin Dr 02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	837	877	156	1261	0	0	0	0	54	2	338
Future Volume (vph)	0	837	877	156	1261	0	0	0	0	54	2	338
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9	4.9	3.0	5.3						4.0	4.0
Lane Util. Factor		0.95	1.00	1.00	0.95						1.00	0.88
Frpb, ped/bikes		1.00	0.98	1.00	1.00						1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		3574	1575	1805	3574						1812	2814
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		3574	1575	1805	3574						1812	2814
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	863	904	161	1300	0	0	0	0	56	2	348
RTOR Reduction (vph)	0	0	274	0	0	0	0	0	0	0	0	174
Lane Group Flow (vph)	0	863	630	161	1300	0	0	0	0	0	58	174
Confl. Peds. (#/hr)			4									
Heavy Vehicles (%)	0%	1%	1%	0%	1%	0%	0%	0%	0%	0%	0%	1%
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			2									4
Actuated Green, G (s)		41.7	41.7	9.0	53.3						7.4	7.4
Effective Green, g (s)		41.7	41.7	9.0	53.3						7.4	7.4
Actuated g/C Ratio		0.60	0.60	0.13	0.76						0.11	0.11
Clearance Time (s)		4.9	4.9	3.0	5.3						4.0	4.0
Vehicle Extension (s)		4.0	4.0	2.0	4.0						2.0	2.0
Lane Grp Cap (vph)		2129	938	232	2721						191	297
v/s Ratio Prot		0.24		c0.09	0.36						0.03	
v/s Ratio Perm			c0.40									c0.06
v/c Ratio		0.41	0.67	0.69	0.48						0.30	0.58
Uniform Delay, d1		7.5	9.5	29.2	3.1						28.9	29.8
Progression Factor		1.00	1.00	1.00	1.00						1.00	1.00
Incremental Delay, d2		0.6	3.8	7.1	0.6						0.3	1.9
Delay (s)		8.1	13.4	36.2	3.7						29.2	31.7
Level of Service		A	B	D	A						C	C
Approach Delay (s)		10.8			7.3			0.0			31.4	
Approach LOS		B			A			A			C	

Intersection Summary				
HCM 2000 Control Delay	11.7	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.66			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	11.9	
Intersection Capacity Utilization	119.4%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
6: US 101 NB Ramps & San Marin Dr

02/15/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	424	417	0	0	424	51	1093	108	202	0	0	0
Future Volume (vph)	424	417	0	0	424	51	1093	108	202	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.6			4.9	4.9	3.5	3.5				
Lane Util. Factor	0.97	1.00			0.95	1.00	0.95	0.95				
Frpb, ped/bikes	1.00	1.00			1.00	0.99	1.00	0.99				
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00				
Frt	1.00	1.00			1.00	0.85	1.00	0.96				
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.97				
Satd. Flow (prot)	3467	1881			3574	1593	1681	1637				
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.97				
Satd. Flow (perm)	3467	1881			3574	1593	1681	1637				
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)	442	434	0	0	442	53	1139	112	210	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	44	0	22	0	0	0	0
Lane Group Flow (vph)	442	434	0	0	442	9	740	700	0	0	0	0
Confl. Peds. (#/hr)			3			1			1	1		
Heavy Vehicles (%)	1%	1%	0%	0%	1%	0%	2%	0%	3%	0%	0%	0%
Turn Type	Prot	NA			NA	Perm	Split	NA				
Protected Phases	5	2			6		8	8				
Permitted Phases						6						
Actuated Green, G (s)	10.1	25.6			11.7	11.7	31.8	31.8				
Effective Green, g (s)	10.1	25.6			11.7	11.7	31.8	31.8				
Actuated g/C Ratio	0.15	0.39			0.18	0.18	0.49	0.49				
Clearance Time (s)	3.5	4.6			4.9	4.9	3.5	3.5				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	2.5	2.5				
Lane Grp Cap (vph)	534	735			638	284	816	794				
v/s Ratio Prot	c0.13	c0.23			0.12		c0.44	0.43				
v/s Ratio Perm						0.01						
v/c Ratio	0.83	0.59			0.69	0.03	0.91	0.88				
Uniform Delay, d1	26.9	15.8			25.2	22.2	15.5	15.2				
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00				
Incremental Delay, d2	9.7	1.5			3.5	0.1	13.6	11.2				
Delay (s)	36.6	17.3			28.7	22.3	29.1	26.4				
Level of Service	D	B			C	C	C	C				
Approach Delay (s)		27.0			28.0			27.7			0.0	
Approach LOS		C			C			C			A	

Intersection Summary				
HCM 2000 Control Delay	27.6	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.85			
Actuated Cycle Length (s)	65.5	Sum of lost time (s)	11.9	
Intersection Capacity Utilization	119.4%	ICU Level of Service	H	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
7: Redwood Blvd & Olive St

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	150	73	34	178	107	109	75	801	207	125	474	142
Future Volume (vph)	150	73	34	178	107	109	75	801	207	125	474	142
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.1	5.1			5.1		4.0	3.9	3.9	4.0	3.9	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.95			0.96		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00			0.98		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1774			1754		1770	3539	1583	1770	3417	
Flt Permitted	0.95	1.00			0.98		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1774			1754		1770	3539	1583	1770	3417	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	158	77	36	187	113	115	79	843	218	132	499	149
RTOR Reduction (vph)	0	17	0	0	12	0	0	0	79	0	24	0
Lane Group Flow (vph)	158	96	0	0	403	0	79	843	139	132	624	0
Turn Type	Split	NA		Split	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	13.3	13.3			25.3		7.7	27.1	27.1	10.1	29.5	
Effective Green, g (s)	13.3	13.3			25.3		7.7	27.1	27.1	10.1	29.5	
Actuated g/C Ratio	0.14	0.14			0.27		0.08	0.29	0.29	0.11	0.31	
Clearance Time (s)	5.1	5.1			5.1		4.0	3.9	3.9	4.0	3.9	
Vehicle Extension (s)	1.0	1.0			1.0		1.0	1.0	1.0	1.0	1.0	
Lane Grp Cap (vph)	250	251			472		145	1021	456	190	1073	
v/s Ratio Prot	c0.09	0.05			c0.23		0.04	c0.24		c0.07	0.18	
v/s Ratio Perm									0.09			
v/c Ratio	0.63	0.38			0.85		0.54	0.83	0.30	0.69	0.58	
Uniform Delay, d1	38.0	36.6			32.6		41.4	31.2	26.1	40.4	27.0	
Progression Factor	1.00	1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.8	0.4			13.5		2.2	5.3	0.1	8.6	0.5	
Delay (s)	41.8	36.9			46.1		43.7	36.5	26.2	49.0	27.5	
Level of Service	D	D			D		D	D	C	D	C	
Approach Delay (s)		39.8			46.1			35.0			31.2	
Approach LOS		D			D			D			C	

Intersection Summary				
HCM 2000 Control Delay	36.1	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.77			
Actuated Cycle Length (s)	93.9	Sum of lost time (s)	18.1	
Intersection Capacity Utilization	70.2%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
8: Redwood Blvd & Grant Ave

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	124	141	313	45	176	85	411	635	71	60	511	157
Future Volume (vph)	124	141	313	45	176	85	411	635	71	60	511	157
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5		3.5	3.7	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.96	1.00	0.99		1.00	0.99	
Flpb, ped/bikes	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	1900	1528	1803	1900	1557	1805	3461		1805	3394	
Flt Permitted	0.56	1.00	1.00	0.63	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1033	1900	1528	1189	1900	1557	1805	3461		1805	3394	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	131	148	329	47	185	89	433	668	75	63	538	165
RTOR Reduction (vph)	0	0	243	0	0	66	0	8	0	0	27	0
Lane Group Flow (vph)	131	148	86	47	185	23	433	735	0	63	676	0
Confl. Peds. (#/hr)	22		46	2		34			36			10
Confl. Bikes (#/hr)			5			5			5			5
Heavy Vehicles (%)	2%	0%	1%	0%	0%	0%	0%	2%	0%	0%	2%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8		8	4		4						
Actuated Green, G (s)	20.2	20.2	20.2	20.2	20.2	20.2	23.8	34.4		11.7	22.1	
Effective Green, g (s)	20.2	20.2	20.2	20.2	20.2	20.2	23.8	34.4		11.7	22.1	
Actuated g/C Ratio	0.26	0.26	0.26	0.26	0.26	0.26	0.31	0.45		0.15	0.29	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5		3.5	3.7	
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0	4.0	2.5	3.0		2.5	3.0	
Lane Grp Cap (vph)	269	496	399	310	496	406	555	1540		273	970	
v/s Ratio Prot		0.08			0.10		c0.24	0.21		0.03	c0.20	
v/s Ratio Perm	c0.13		0.06	0.04		0.01						
v/c Ratio	0.49	0.30	0.22	0.15	0.37	0.06	0.78	0.48		0.23	0.70	
Uniform Delay, d1	24.2	22.9	22.3	22.0	23.4	21.4	24.4	15.1		28.8	24.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.9	0.5	0.4	0.3	0.6	0.1	6.8	0.2		0.3	2.2	
Delay (s)	26.1	23.3	22.7	22.3	24.0	21.5	31.1	15.4		29.2	26.8	
Level of Service	C	C	C	C	C	C	C	B		C	C	
Approach Delay (s)		23.6			23.1			21.2			27.0	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM 2000 Control Delay	23.4	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.66			
Actuated Cycle Length (s)	77.3	Sum of lost time (s)	11.2	
Intersection Capacity Utilization	92.7%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

HCM 2010 AWSC
9: San Marin Dr/Sutro Ave & Novato Blvd #1

02/15/2018

Intersection	
Intersection Delay, s/veh	92.2
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	89	157	54	74	306	192	66	129	58	177	230	413
Future Vol, veh/h	89	157	54	74	306	192	66	129	58	177	230	413
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	94	165	57	78	322	202	69	136	61	186	242	435
Number of Lanes	1	1	0	1	1	0	1	1	0	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	3	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	3	2	2
HCM Control Delay	28.8	203.5	26.6	58.1
HCM LOS	D	F	D	F

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%	0%
Vol Thru, %	0%	69%	0%	74%	0%	61%	0%	100%	0%
Vol Right, %	0%	31%	0%	26%	0%	39%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	66	187	89	211	74	498	177	230	413
LT Vol	66	0	89	0	74	0	177	0	0
Through Vol	0	129	0	157	0	306	0	230	0
RT Vol	0	58	0	54	0	192	0	0	413
Lane Flow Rate	69	197	94	222	78	524	186	242	435
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.218	0.578	0.288	0.642	0.228	1.42	0.507	0.626	1.04
Departure Headway (Hd)	12.513	11.749	12.168	11.454	10.852	10.054	10.844	10.32	9.585
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	289	309	297	318	333	367	335	353	383
Service Time	10.213	9.449	9.868	9.154	8.552	7.754	8.544	8.02	7.285
HCM Lane V/C Ratio	0.239	0.638	0.316	0.698	0.234	1.428	0.555	0.686	1.136
HCM Control Delay	18.7	29.4	19.7	32.6	16.7	231.2	24.2	28.8	88.9
HCM Lane LOS	C	D	C	D	C	F	C	D	F
HCM 95th-tile Q	0.8	3.4	1.2	4.2	0.9	26.1	2.7	4	13.1

HCM Signalized Intersection Capacity Analysis
9: San Marin Dr/Sutro Ave & Novato Blvd #1 02/16/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	157	54	74	306	192	66	129	58	177	230	413
Future Volume (vph)	89	157	54	74	306	192	66	129	58	177	230	413
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.94		1.00	0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1791		1770	1755		1770	1776		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	1791		1770	1755		1770	1776		1770	1863	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	94	165	57	78	322	202	69	136	61	186	242	435
RTOR Reduction (vph)	0	13	0	0	25	0	0	20	0	0	0	309
Lane Group Flow (vph)	94	209	0	78	499	0	69	177	0	186	242	126
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	5.1	23.8		6.2	24.9		6.0	14.6		11.9	20.5	20.5
Effective Green, g (s)	5.1	23.8		6.2	24.9		6.0	14.6		11.9	20.5	20.5
Actuated g/C Ratio	0.07	0.34		0.09	0.35		0.09	0.21		0.17	0.29	0.29
Clearance Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	128	604		155	619		150	367		298	541	460
v/s Ratio Prot	c0.05	0.12		0.04	c0.28		0.04	0.10		c0.11	c0.13	
v/s Ratio Perm												0.08
v/c Ratio	0.73	0.35		0.50	0.81		0.46	0.48		0.62	0.45	0.27
Uniform Delay, d1	32.0	17.5		30.7	20.6		30.7	24.6		27.2	20.4	19.3
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	19.5	0.3		2.6	7.6		2.2	1.0		4.0	0.6	0.3
Delay (s)	51.5	17.9		33.2	28.2		32.9	25.6		31.3	21.0	19.6
Level of Service	D	B		C	C		C	C		C	C	B
Approach Delay (s)		27.9			28.9			27.5			22.5	
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	0.69			
Actuated Cycle Length (s)	70.5	Sum of lost time (s)	14.0	
Intersection Capacity Utilization	67.0%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

MOVEMENT SUMMARY

Site: 9 [PM Existing + Project]

Novato Boulevard/San Marin Dr-Sutro Ave
PM Existing + Project

Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NB Sutro Ave											
3	L2	69	2.0	0.313	7.7	LOS A	1.5	37.8	0.59	0.55	32.9
8	T1	136	2.0	0.313	7.7	LOS A	1.5	37.8	0.59	0.55	32.9
18	R2	61	2.0	0.313	7.7	LOS A	1.5	37.8	0.59	0.55	32.0
Approach		266	2.0	0.313	7.7	LOS A	1.5	37.8	0.59	0.55	32.7
East: WB Novato Blvd											
1	L2	78	2.0	0.607	12.1	LOS B	6.5	165.3	0.71	0.73	31.2
6	T1	322	2.0	0.607	12.1	LOS B	6.5	165.3	0.71	0.73	31.2
16	R2	202	2.0	0.607	12.1	LOS B	6.5	165.3	0.71	0.73	30.4
Approach		602	2.0	0.607	12.1	LOS B	6.5	165.3	0.71	0.73	30.9
North: SB San Marin Drive											
7	L2	186	2.0	0.476	10.0	LOS A	3.1	78.3	0.65	0.70	31.5
4	T1	242	2.0	0.476	10.0	LOS A	3.1	78.3	0.65	0.70	31.5
14	R2	435	2.0	0.483	10.1	LOS B	3.2	81.1	0.65	0.71	31.3
Approach		863	2.0	0.483	10.0	LOS B	3.2	81.1	0.65	0.71	31.4
West: EB Novato Blvd											
5	L2	94	2.0	0.395	9.4	LOS A	2.1	53.6	0.66	0.68	32.0
2	T1	165	2.0	0.395	9.4	LOS A	2.1	53.6	0.66	0.68	32.0
12	R2	57	2.0	0.395	9.4	LOS A	2.1	53.6	0.66	0.68	31.2
Approach		316	2.0	0.395	9.4	LOS A	2.1	53.6	0.66	0.68	31.9
All Vehicles		2047	2.0	0.607	10.2	LOS B	6.5	165.3	0.66	0.69	31.5

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Organisation: W-TRANS | Processed: Tuesday, February 27, 2018 3:54:43 PM
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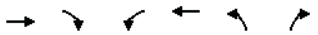
HCM Signalized Intersection Capacity Analysis
10: Wilson Ave & Novato Blvd #2

02/15/2018



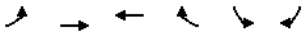
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	526	40	442	812	45	292
Future Volume (vph)	526	40	442	812	45	292
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.9		3.0	3.6	3.6	3.6
Lane Util. Factor	0.95		1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.99		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3533		1787	3610	1805	1593
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3533		1787	3610	1805	1593
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	554	42	465	855	47	307
RTOR Reduction (vph)	5	0	0	0	0	260
Lane Group Flow (vph)	591	0	465	855	47	47
Confl. Peds. (#/hr)		3			6	2
Heavy Vehicles (%)	1%	0%	1%	0%	0%	0%
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases						4
Actuated Green, G (s)	30.9		19.3	38.3	11.1	11.1
Effective Green, g (s)	30.9		19.3	38.3	11.1	11.1
Actuated g/C Ratio	0.43		0.27	0.53	0.15	0.15
Clearance Time (s)	3.9		3.0	3.6	3.6	3.6
Vehicle Extension (s)	3.0		2.0	3.0	2.0	2.0
Lane Grp Cap (vph)	1520		480	1925	279	246
v/s Ratio Prot	c0.17		c0.26	c0.24	0.03	
v/s Ratio Perm						c0.03
v/c Ratio	0.39		0.97	0.44	0.17	0.19
Uniform Delay, d1	14.0		26.0	10.2	26.3	26.4
Progression Factor	1.00		0.91	0.44	1.00	1.00
Incremental Delay, d2	0.8		29.4	0.6	0.1	0.1
Delay (s)	14.7		53.1	5.2	26.4	26.6
Level of Service	B		D	A	C	C
Approach Delay (s)	14.7			22.0	26.6	
Approach LOS	B			C	C	

Intersection Summary				
HCM 2000 Control Delay	20.8	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.56			
Actuated Cycle Length (s)	71.8	Sum of lost time (s)	10.5	
Intersection Capacity Utilization	59.1%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
11: Novato Blvd #2 & Simmons Ln

02/15/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	128	691	984	104	106	281
Future Volume (vph)	128	691	984	104	106	281
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.9	3.6		3.0	3.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	3574	3551		1805	1599
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1805	3574	3551		1805	1599
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	135	727	1036	109	112	296
RTOR Reduction (vph)	0	0	7	0	0	246
Lane Group Flow (vph)	135	727	1138	0	112	50
Confl. Peds. (#/hr)					2	
Confl. Bikes (#/hr)				1		
Heavy Vehicles (%)	0%	1%	0%	0%	0%	1%
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	5	2	6		8	
Permitted Phases						8
Actuated Green, G (s)	12.2	30.9	38.3		11.7	11.7
Effective Green, g (s)	12.2	30.9	38.3		11.7	11.7
Actuated g/C Ratio	0.17	0.43	0.53		0.16	0.16
Clearance Time (s)	3.0	3.9	3.6		3.0	3.0
Vehicle Extension (s)	2.0	3.0	3.0		2.0	2.0
Lane Grp Cap (vph)	306	1538	1894		294	260
v/s Ratio Prot	0.07	c0.20	c0.32		c0.06	
v/s Ratio Perm						0.03
v/c Ratio	0.44	0.47	0.60		0.38	0.19
Uniform Delay, d1	26.7	14.6	11.5		26.8	26.0
Progression Factor	0.69	0.52	1.00		1.00	1.00
Incremental Delay, d2	4.3	1.0	1.4		0.3	0.1
Delay (s)	22.8	8.6	12.9		27.1	26.1
Level of Service	C	A	B		C	C
Approach Delay (s)		10.9	12.9		26.4	
Approach LOS		B	B		C	

Intersection Summary				
HCM 2000 Control Delay	14.5	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.55			
Actuated Cycle Length (s)	71.8	Sum of lost time (s)	10.5	
Intersection Capacity Utilization	54.7%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
12: Grant Ave & Novato Blvd #2

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	160	638	1	2	885	51	1	6	4	24	1	288
Future Volume (vph)	160	638	1	2	885	51	1	6	4	24	1	288
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.5	4.5	3.5	4.9	4.9		4.0		3.5	3.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00		1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.95	1.00	1.00	0.96		0.98		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00		1.00		0.97	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.95		1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		1.00		0.95	1.00	
Satd. Flow (prot)	1787	1863	1534	1805	3539	1529		1762		1737	1595	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.53		0.75	1.00	
Satd. Flow (perm)	1787	1863	1534	1805	3539	1529		947		1372	1595	
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)	167	665	1	2	922	53	1	6	4	25	1	300
RTOR Reduction (vph)	0	0	0	0	0	18	0	4	0	0	269	0
Lane Group Flow (vph)	167	665	1	2	922	35	0	7	0	25	32	0
Confl. Peds. (#/hr)			11			8	1		14	14		1
Confl. Bikes (#/hr)			1			4			2			
Heavy Vehicles (%)	1%	2%	0%	0%	2%	1%	0%	0%	0%	1%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8			4		
Actuated Green, G (s)	14.6	86.1	86.1	1.2	72.3	72.3		10.7		11.2	11.2	
Effective Green, g (s)	14.6	86.1	86.1	1.2	72.3	72.3		10.7		11.2	11.2	
Actuated g/C Ratio	0.13	0.78	0.78	0.01	0.66	0.66		0.10		0.10	0.10	
Clearance Time (s)	3.5	4.5	4.5	3.5	4.9	4.9		4.0		3.5	3.5	
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0	3.0		2.0		2.0	2.0	
Lane Grp Cap (vph)	237	1458	1200	19	2326	1004		92		139	162	
v/s Ratio Prot	c0.09	c0.36		0.00	0.26						c0.02	
v/s Ratio Perm			0.00			0.02		0.01		0.02		
v/c Ratio	0.70	0.46	0.00	0.11	0.40	0.03		0.08		0.18	0.19	
Uniform Delay, d1	45.6	4.0	2.6	53.9	8.7	6.6		45.2		45.2	45.3	
Progression Factor	1.00	1.00	1.00	1.34	0.22	0.22		1.00		1.00	1.00	
Incremental Delay, d2	7.5	1.0	0.0	0.6	0.4	0.0		0.1		0.2	0.2	
Delay (s)	53.2	5.1	2.6	73.1	2.3	1.5		45.3		45.4	45.5	
Level of Service	D	A	A	E	A	A		D		D	D	
Approach Delay (s)		14.7			2.4			45.3			45.5	
Approach LOS		B			A			D			D	

Intersection Summary					
HCM 2000 Control Delay	13.9	HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio	0.48				
Actuated Cycle Length (s)	110.0	Sum of lost time (s)		12.4	
Intersection Capacity Utilization	67.1%	ICU Level of Service		C	
Analysis Period (min)	15				
c Critical Lane Group					

HCM Signalized Intersection Capacity Analysis
13: Tamalpais Ave/7th St & Novato Blvd #2

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	134	557	41	67	794	215	43	119	43	184	110	123
Future Volume (vph)	134	557	41	67	794	215	43	119	43	184	110	123
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.0		3.5	5.0	5.0	3.5	3.5		3.5	3.5	3.5
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.96	1.00	0.99		1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.99	1.00		0.99	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1787	1839		1787	1863	1541	1768	1786		1765	1881	1533
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.62	1.00		0.51	1.00	1.00
Satd. Flow (perm)	1787	1839		1787	1863	1541	1148	1786		939	1881	1533
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)	140	580	43	70	827	224	45	124	45	192	115	128
RTOR Reduction (vph)	0	2	0	0	0	33	0	13	0	0	0	100
Lane Group Flow (vph)	140	621	0	70	827	191	45	156	0	192	115	28
Confl. Peds. (#/hr)			10			6	5		7	7		5
Confl. Bikes (#/hr)						3			2			5
Heavy Vehicles (%)	1%	2%	1%	1%	2%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8			4		4
Actuated Green, G (s)	12.7	66.3		7.5	61.1	61.1	24.2	24.2		24.2	24.2	24.2
Effective Green, g (s)	12.7	66.3		7.5	61.1	61.1	24.2	24.2		24.2	24.2	24.2
Actuated g/C Ratio	0.12	0.60		0.07	0.56	0.56	0.22	0.22		0.22	0.22	0.22
Clearance Time (s)	3.5	5.0		3.5	5.0	5.0	3.5	3.5		3.5	3.5	3.5
Vehicle Extension (s)	2.0	5.0		2.0	5.0	5.0	2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	206	1108		121	1034	855	252	392		206	413	337
v/s Ratio Prot	c0.08	0.34		0.04	c0.44			0.09			0.06	
v/s Ratio Perm						0.12	0.04			c0.20		0.02
v/c Ratio	0.68	0.56		0.58	0.80	0.22	0.18	0.40		0.93	0.28	0.08
Uniform Delay, d1	46.7	13.1		49.7	19.6	12.4	34.8	36.7		42.1	35.6	34.1
Progression Factor	0.89	1.15		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	6.4	1.9		4.1	6.5	0.6	0.1	0.2		43.3	0.1	0.0
Delay (s)	48.1	17.0		53.8	26.0	13.0	35.0	36.9		85.4	35.8	34.1
Level of Service	D	B		D	C	B	C	D		F	D	C
Approach Delay (s)		22.7			25.2			36.5			57.2	
Approach LOS		C			C			D			E	

Intersection Summary					
HCM 2000 Control Delay	30.9	HCM 2000 Level of Service		C	
HCM 2000 Volume to Capacity ratio	0.82				
Actuated Cycle Length (s)	110.0	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	85.3%	ICU Level of Service		E	
Analysis Period (min)	15				
c Critical Lane Group					

HCM Signalized Intersection Capacity Analysis
14: Diablo Ave & Novato Blvd #2

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	254	22	284	327	633	49	439	238	448	334	12
Future Volume (vph)	24	254	22	284	327	633	49	439	238	448	334	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	11	11	12	11	11	12	12	12	12
Total Lost time (s)		3.7		4.1	4.1	4.1	4.4	4.4	4.4	4.1	4.1	
Lane Util. Factor		0.95		0.91	0.91	1.00	1.00	1.00	1.00	0.91	0.91	
Frpb, ped/bikes		1.00		1.00	1.00	0.95	1.00	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	1.00	
Frt		0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		1.00		0.95	0.99	1.00	0.95	1.00	1.00	0.95	0.98	
Satd. Flow (prot)		3514		1557	3269	1501	1728	1801	1560	1610	3319	
Flt Permitted		1.00		0.95	0.99	1.00	0.95	1.00	1.00	0.95	0.98	
Satd. Flow (perm)		3514		1557	3269	1501	1728	1801	1560	1610	3319	
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)	26	270	23	302	348	673	52	467	253	477	355	13
RTOR Reduction (vph)	0	4	0	0	0	278	0	0	155	0	2	0
Lane Group Flow (vph)	0	315	0	211	439	395	52	467	98	277	566	0
Confl. Peds. (#/hr)			10			15			2			3
Confl. Bikes (#/hr)			1			1						6
Heavy Vehicles (%)	1%	1%	1%	2%	1%	2%	1%	2%	2%	2%	2%	1%
Turn Type	Split	NA		Split	NA	Perm	Split	NA	Perm	Split	NA	
Protected Phases	3	3		4	4		1	1		2	2	
Permitted Phases						4			1		2	
Actuated Green, G (s)		15.9		29.2	29.2	29.2	32.2	32.2	32.2	24.0	24.0	
Effective Green, g (s)		15.9		29.2	29.2	29.2	32.2	32.2	32.2	24.0	24.0	
Actuated g/C Ratio		0.14		0.25	0.25	0.25	0.27	0.27	0.27	0.20	0.20	
Clearance Time (s)		3.7		4.1	4.1	4.1	4.4	4.4	4.4	4.1	4.1	
Vehicle Extension (s)		2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)		475		386	811	372	473	493	427	328	677	
v/s Ratio Prot		c0.09		0.14	0.13		0.03	c0.26		c0.17	0.17	
v/s Ratio Perm						c0.26			0.06			
v/c Ratio		0.66		0.55	0.54	1.06	0.11	0.95	0.23	0.84	0.84	
Uniform Delay, d1		48.3		38.4	38.4	44.2	32.0	41.9	33.1	45.0	44.9	
Progression Factor		1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		2.7		0.9	0.4	63.9	0.0	27.2	0.1	17.1	8.5	
Delay (s)		51.0		39.3	38.8	108.1	32.0	69.1	33.2	62.1	53.4	
Level of Service		D		D	D	F	C	E	C	E	D	
Approach Delay (s)		51.0			74.1			54.8			56.2	
Approach LOS		D			E			D			E	

Intersection Summary				
HCM 2000 Control Delay	62.6	HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio	0.91			
Actuated Cycle Length (s)	117.6	Sum of lost time (s)	16.3	
Intersection Capacity Utilization	86.4%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
14: Diablo Ave & Novato Blvd #2

02/16/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	254	22	284	327	633	49	439	238	448	334	12
Future Volume (vph)	24	254	22	284	327	633	49	439	238	448	334	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	12	11	11	12	10	12	12
Total Lost time (s)	4.0	4.1	4.1	4.0	4.0	4.0	4.0	4.1		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		0.97	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1728	1818	1512	1711	1818	1555	1728	3225		3204	1852	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1728	1818	1512	1711	1818	1555	1728	3225		3204	1852	
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)	26	270	23	302	348	673	52	467	253	477	355	13
RTOR Reduction (vph)	0	0	19	0	0	87	0	64	0	0	1	0
Lane Group Flow (vph)	26	270	4	302	348	586	52	656	0	477	367	0
Confl. Peds. (#/hr)			10			15			2			3
Confl. Bikes (#/hr)			1			1						6
Heavy Vehicles (%)	1%	1%	1%	2%	1%	2%	1%	2%	2%	2%	2%	1%
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	4.8	19.5	19.5	22.1	36.9	54.2	6.4	24.8		17.3	35.8	
Effective Green, g (s)	4.8	19.5	19.5	22.1	36.9	54.2	6.4	24.8		17.3	35.8	
Actuated g/C Ratio	0.05	0.20	0.20	0.22	0.37	0.54	0.06	0.25		0.17	0.36	
Clearance Time (s)	4.0	4.1	4.1	4.0	4.0	4.0	4.0	4.1		4.0	4.0	
Vehicle Extension (s)	3.0	2.0	2.0	3.0	3.0	3.0	3.0	2.0		3.0	3.0	
Lane Grp Cap (vph)	83	354	295	378	671	843	110	800		554	663	
v/s Ratio Prot	0.02	c0.15		c0.18	0.19	0.12	0.03	c0.20		c0.15	0.20	
v/s Ratio Perm			0.00			0.26						
v/c Ratio	0.31	0.76	0.02	0.80	0.52	0.69	0.47	0.82		0.86	0.55	
Uniform Delay, d1	46.0	38.0	32.4	36.8	24.6	16.8	45.1	35.4		40.1	25.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.2	8.5	0.0	11.2	0.7	2.5	3.2	6.4		12.9	1.0	
Delay (s)	48.1	46.5	32.5	48.0	25.3	19.3	48.3	41.9		53.1	26.7	
Level of Service	D	D	C	D	C	B	D	D		D	C	
Approach Delay (s)		45.6			27.4			42.3			41.6	
Approach LOS		D			C			D			D	

Intersection Summary				
HCM 2000 Control Delay	36.4	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.81			
Actuated Cycle Length (s)	99.9	Sum of lost time (s)	16.2	
Intersection Capacity Utilization	79.7%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
15: Redwood Blvd & Diablo Ave/De Long Ave

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	284	578	107	107	966	418	138	317	87	335	230	228
Future Volume (vph)	284	578	107	107	966	418	138	317	87	335	230	228
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	9
Total Lost time (s)	4.0	3.7		4.0	4.1		3.5	4.8	4.8	3.5	3.5	3.5
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95	1.00	0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3467	3526		1805	3335		1805	3610	1508	3303	1900	1394
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3467	3526		1805	3335		1805	3610	1508	3303	1900	1394
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	290	590	109	109	986	427	141	323	89	342	235	233
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	33	0	0	50
Lane Group Flow (vph)	290	699	0	109	1413	0	141	323	56	342	235	183
Confl. Peds. (#/hr)						2			7			14
Confl. Bikes (#/hr)												3
Heavy Vehicles (%)	1%	0%	0%	0%	2%	5%	0%	0%	5%	6%	0%	1%
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)	17.1	61.0		17.0	60.5		14.6	22.1	22.1	13.9	22.7	22.7
Effective Green, g (s)	17.1	61.0		17.0	60.5		14.6	22.1	22.1	13.9	22.7	22.7
Actuated g/C Ratio	0.13	0.47		0.13	0.47		0.11	0.17	0.17	0.11	0.17	0.17
Clearance Time (s)	4.0	3.7		4.0	4.1		3.5	4.8	4.8	3.5	3.5	3.5
Vehicle Extension (s)	2.5	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	456	1654		236	1552		202	613	256	353	331	243
v/s Ratio Prot	c0.08	0.20		0.06	c0.42		0.08	0.09		c0.10	0.12	
v/s Ratio Perm									0.04			c0.13
v/c Ratio	0.64	0.42		0.46	0.91		0.70	0.53	0.22	0.97	0.71	0.76
Uniform Delay, d1	53.5	22.8		52.3	32.2		55.6	49.2	46.5	57.8	50.5	51.0
Progression Factor	1.00	1.00		1.43	0.53		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.5	0.8		0.3	5.8		8.2	0.4	0.2	38.9	5.6	11.2
Delay (s)	56.0	23.6		75.2	23.0		63.8	49.6	46.7	96.8	56.2	62.2
Level of Service	E	C		E	C		E	D	D	F	E	E
Approach Delay (s)		33.1			26.7			52.7			75.0	
Approach LOS		C			C			D			E	

Intersection Summary				
HCM 2000 Control Delay	42.2	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.85			
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.4	
Intersection Capacity Utilization	96.7%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
16: Reichert Ave & De Long Ave

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	87	877	18	95	1366	350	12	30	51	248	18	82
Future Volume (vph)	87	877	18	95	1366	350	12	30	51	248	18	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.1		3.0	4.1		3.5	3.5	3.5	3.5	3.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00	0.98	1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00	1.00	0.99	1.00	
Frt	1.00	1.00		1.00	0.97		1.00	1.00	0.85	1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1805	3527		1805	3428		1794	1900	1577	1763	1634	
Flt Permitted	0.95	1.00		0.95	1.00		0.62	1.00	1.00	0.74	1.00	
Satd. Flow (perm)	1805	3527		1805	3428		1173	1900	1577	1366	1634	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	92	923	19	100	1438	368	13	32	54	261	19	86
RTOR Reduction (vph)	0	1	0	0	14	0	0	0	15	0	28	0
Lane Group Flow (vph)	92	941	0	100	1792	0	13	32	39	261	77	0
Confl. Peds. (#/hr)			5			11	5		5	11		5
Confl. Bikes (#/hr)			5			5			5			5
Heavy Vehicles (%)	0%	2%	0%	0%	1%	1%	0%	0%	0%	1%	0%	0%
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	11.0	80.3		10.8	80.1		28.3	28.3	28.3	28.3	28.3	
Effective Green, g (s)	11.0	80.3		10.8	80.1		28.3	28.3	28.3	28.3	28.3	
Actuated g/C Ratio	0.08	0.62		0.08	0.62		0.22	0.22	0.22	0.22	0.22	
Clearance Time (s)	3.0	4.1		3.0	4.1		3.5	3.5	3.5	3.5	3.5	
Vehicle Extension (s)	2.0	3.0		2.0	3.0		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	152	2178		149	2112		255	413	343	297	355	
v/s Ratio Prot	0.05	0.27		c0.06	c0.52			0.02			0.05	
v/s Ratio Perm							0.01		0.02	c0.19		
v/c Ratio	0.61	0.43		0.67	0.85		0.05	0.08	0.11	0.88	0.22	
Uniform Delay, d1	57.4	13.0		57.9	20.1		40.2	40.5	40.8	49.2	41.7	
Progression Factor	0.75	1.15		0.99	0.72		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.8	0.5		7.1	3.5		0.0	0.0	0.1	23.5	0.1	
Delay (s)	46.8	15.4		64.2	17.9		40.3	40.5	40.8	72.7	41.9	
Level of Service	D	B		E	B		D	D	D	E	D	
Approach Delay (s)		18.2			20.4			40.7			63.9	
Approach LOS		B			C			D			E	

Intersection Summary				
HCM 2000 Control Delay	25.0	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.84			
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	10.6	
Intersection Capacity Utilization	87.5%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
17: US 101 SB Ramps & De Long Ave

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	211	1005	27	1758	0	0	0	0	10	7	177
Future Volume (vph)	0	211	1005	27	1758	0	0	0	0	10	7	177
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.6	3.6	3.0	3.6					4.0	4.0	
Lane Util. Factor		0.95	1.00	1.00	0.95					0.95	0.95	
Frt		1.00	0.85	1.00	1.00					1.00	0.86	
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (prot)		3574	1599	1770	3539					1681	1515	
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (perm)		3574	1599	1770	3539					1681	1515	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	215	1026	28	1794	0	0	0	0	10	7	181
RTOR Reduction (vph)	0	0	283	0	0	0	0	0	0	0	41	0
Lane Group Flow (vph)	0	215	743	28	1794	0	0	0	0	9	148	0
Heavy Vehicles (%)	0%	1%	1%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type		NA	Perm	Prot	NA					Split	NA	
Protected Phases		6		5	2					4	4	
Permitted Phases			6									
Actuated Green, G (s)		91.1	91.1	11.0	105.1					17.3	17.3	
Effective Green, g (s)		91.1	91.1	11.0	105.1					17.3	17.3	
Actuated g/C Ratio		0.70	0.70	0.08	0.81					0.13	0.13	
Clearance Time (s)		3.6	3.6	3.0	3.6					4.0	4.0	
Vehicle Extension (s)		4.0	4.0	2.0	4.0					2.5	2.5	
Lane Grp Cap (vph)		2504	1120	149	2861					223	201	
v/s Ratio Prot		0.06		0.02	c0.51					0.01	c0.10	
v/s Ratio Perm			c0.46									
v/c Ratio		0.09	0.66	0.19	0.63					0.04	0.74	
Uniform Delay, d1		6.2	10.9	55.3	4.8					49.1	54.2	
Progression Factor		0.84	5.78	0.79	0.44					1.00	1.00	
Incremental Delay, d2		0.1	2.8	0.1	0.7					0.1	12.5	
Delay (s)		5.3	65.6	44.0	2.9					49.2	66.6	
Level of Service		A	E	D	A					D	E	
Approach Delay (s)		55.2			3.5			0.0			65.8	
Approach LOS		E			A			A			E	

Intersection Summary				
HCM 2000 Control Delay	26.9	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.68			
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	10.6	
Intersection Capacity Utilization	128.8%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
18: US 101 NB Ramps & De Long Ave

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	178	45	0	0	61	28	1711	24	33	0	0	0
Future Volume (vph)	178	45	0	0	61	28	1711	24	33	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.6			3.6		4.5	4.5				
Lane Util. Factor	1.00	0.95			0.95		0.95	0.95				
Frpb, ped/bikes	1.00	1.00			1.00		1.00	1.00				
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00				
Frt	1.00	1.00			0.95		1.00	0.99				
Flt Protected	0.95	1.00			1.00		0.95	0.96				
Satd. Flow (prot)	1770	3610			3353		1698	1695				
Flt Permitted	0.95	1.00			1.00		0.95	0.96				
Satd. Flow (perm)	1770	3610			3353		1698	1695				
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)	185	47	0	0	64	29	1782	25	34	0	0	0
RTOR Reduction (vph)	0	0	0	0	27	0	0	1	0	0	0	0
Lane Group Flow (vph)	185	47	0	0	66	0	927	913	0	0	0	0
Confl. Peds. (#/hr)						1						
Heavy Vehicles (%)	2%	0%	0%	0%	0%	7%	1%	0%	6%	0%	0%	0%
Turn Type	Prot	NA			NA		Split	NA				
Protected Phases	1	6			2		4	4				
Permitted Phases												
Actuated Green, G (s)	15.8	27.6			8.3		94.3	94.3				
Effective Green, g (s)	15.8	27.6			8.3		94.3	94.3				
Actuated g/C Ratio	0.12	0.21			0.06		0.73	0.73				
Clearance Time (s)	3.5	3.6			3.6		4.5	4.5				
Vehicle Extension (s)	2.5	2.0			2.0		3.0	3.0				
Lane Grp Cap (vph)	215	766			214		1231	1229				
v/s Ratio Prot	c0.10	0.01			c0.02		c0.55	0.54				
v/s Ratio Perm												
v/c Ratio	0.86	0.06			0.31		0.75	0.74				
Uniform Delay, d1	56.0	40.9			58.1		10.8	10.6				
Progression Factor	1.13	1.10			1.00		1.00	1.00				
Incremental Delay, d2	27.5	0.0			0.3		4.3	4.1				
Delay (s)	91.1	44.9			58.4		15.1	14.7				
Level of Service	F	D			E		B	B				
Approach Delay (s)		81.7			58.4			14.9			0.0	
Approach LOS		F			E			B			A	

Intersection Summary				
HCM 2000 Control Delay	23.9	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.74			
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	11.6	
Intersection Capacity Utilization	128.8%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
19: Redwood Blvd & Lamont Ave

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	4	23	48	3	57	21	509	60	72	430	15
Future Volume (vph)	31	4	23	48	3	57	21	509	60	72	430	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	3.5		3.5	3.5	3.5	4.8		3.5	4.8	4.8
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes		1.00	1.00		1.00	0.99	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85		1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected		0.96	1.00		0.95	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1818	1615		1814	1595	1805	3545		1805	3610	1615
Flt Permitted		0.80	1.00		0.77	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1511	1615		1462	1595	1805	3545		1805	3610	1615
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	33	4	24	51	3	60	22	536	63	76	453	16
RTOR Reduction (vph)	0	0	18	0	0	46	0	8	0	0	0	8
Lane Group Flow (vph)	0	37	6	0	54	14	22	591	0	76	453	8
Confl. Peds. (#/hr)	1					1			2			
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8		8	4		4						2
Actuated Green, G (s)		12.1	12.1		12.1	12.1	1.0	22.7		5.4	27.1	27.1
Effective Green, g (s)		12.1	12.1		12.1	12.1	1.0	22.7		5.4	27.1	27.1
Actuated g/C Ratio		0.23	0.23		0.23	0.23	0.02	0.44		0.10	0.52	0.52
Clearance Time (s)		3.5	3.5		3.5	3.5	3.5	4.8		3.5	4.8	4.8
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0	3.0		2.0	3.0	3.0
Lane Grp Cap (vph)		351	375		340	371	34	1547		187	1881	841
v/s Ratio Prot							0.01	c0.17		c0.04	0.13	
v/s Ratio Perm		0.02	0.00		c0.04	0.01						0.01
v/c Ratio		0.11	0.01		0.16	0.04	0.65	0.38		0.41	0.24	0.01
Uniform Delay, d1		15.7	15.4		15.9	15.4	25.3	9.9		21.8	6.8	6.0
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		0.0	0.0		0.1	0.0	27.5	0.2		0.5	0.1	0.0
Delay (s)		15.7	15.4		16.0	15.5	52.8	10.1		22.3	6.9	6.0
Level of Service		B	B		B	B	D	B		C	A	A
Approach Delay (s)		15.6			15.7			11.6			9.0	
Approach LOS		B			B			B			A	

Intersection Summary				
HCM 2000 Control Delay	11.1	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.32			
Actuated Cycle Length (s)	52.0	Sum of lost time (s)	11.8	
Intersection Capacity Utilization	46.2%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
20: Redwood Blvd & Landing Ct

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	3	30	0	27	1	577	27	18	550	1
Future Volume (vph)	0	0	3	30	0	27	1	577	27	18	550	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5		3.5		3.5		4.8	4.8	3.5	4.8	4.8
Lane Util. Factor		1.00		1.00		1.00		0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes		0.99		1.00		1.00		1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes		1.00		1.00		1.00		1.00	1.00	1.00	1.00	1.00
Frt		0.86		1.00		0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected		1.00		0.95		1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1622		1803		1615		3610	1579	1805	3610	1571
Flt Permitted		1.00		0.76		1.00		0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1622		1434		1615		3446	1579	1805	3610	1571
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	3	32	0	28	1	607	28	19	579	1
RTOR Reduction (vph)	0	3	0	0	0	24	0	0	12	0	0	0
Lane Group Flow (vph)	0	0	0	32	0	4	0	608	16	19	579	1
Confl. Peds. (#/hr)			4	4					3			6
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type		NA		Perm		Perm	Perm	NA	Perm	Prot	NA	Perm
Protected Phases		4						2		1	6	
Permitted Phases	4			8		8	2		2			6
Actuated Green, G (s)		7.0		7.0		7.0		27.9	27.9	0.8	32.2	32.2
Effective Green, g (s)		7.0		7.0		7.0		27.9	27.9	0.8	32.2	32.2
Actuated g/C Ratio		0.15		0.15		0.15		0.59	0.59	0.02	0.68	0.68
Clearance Time (s)		3.5		3.5		3.5		4.8	4.8	3.5	4.8	4.8
Vehicle Extension (s)		3.0		2.0		2.0		4.0	4.0	2.0	4.0	4.0
Lane Grp Cap (vph)		239		211		238		2024	927	30	2447	1064
v/s Ratio Prot		0.00								c0.01	0.16	
v/s Ratio Perm				c0.02		0.00		c0.18	0.01			0.00
v/c Ratio		0.00		0.15		0.02		0.30	0.02	0.63	0.24	0.00
Uniform Delay, d1		17.3		17.7		17.3		4.9	4.1	23.2	2.9	2.5
Progression Factor		1.00		1.00		1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.0		0.1		0.0		0.1	0.0	27.8	0.1	0.0
Delay (s)		17.3		17.8		17.3		5.0	4.1	51.0	3.0	2.5
Level of Service		B		B		B		A	A	D	A	A
Approach Delay (s)		17.3			17.6			5.0			4.5	
Approach LOS		B			B			A			A	

Intersection Summary				
HCM 2000 Control Delay	5.4	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.28			
Actuated Cycle Length (s)	47.5	Sum of lost time (s)	11.8	
Intersection Capacity Utilization	42.1%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
21: Novato Blvd #3 & Center Rd/Garden Ct

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	149	1	199	4	2	2	203	572	5	2	556	97
Future Volume (vph)	149	1	199	4	2	2	203	572	5	2	556	97
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.2	3.2			3.0		3.0	4.4		3.0	4.4	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.85			0.97		1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1616			1791		1805	3604		1805	3483	
Flt Permitted	0.75	1.00			0.90		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1430	1616			1655		1805	3604		1805	3483	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	157	1	209	4	2	2	214	602	5	2	585	102
RTOR Reduction (vph)	0	174	0	0	2	0	0	0	0	0	10	0
Lane Group Flow (vph)	157	36	0	0	6	0	214	607	0	2	677	0
Confl. Peds. (#/hr)									9			6
Confl. Bikes (#/hr)									2			
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4								
Actuated Green, G (s)	16.6	16.6			16.8		16.2	70.6		2.2	56.6	
Effective Green, g (s)	16.6	16.6			16.8		16.2	70.6		2.2	56.6	
Actuated g/C Ratio	0.17	0.17			0.17		0.16	0.71		0.02	0.57	
Clearance Time (s)	3.2	3.2			3.0		3.0	4.4		3.0	4.4	
Vehicle Extension (s)	3.0	3.0			2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	237	268			278		292	2544		39	1971	
v/s Ratio Prot		0.02					c0.12	0.17		0.00	c0.19	
v/s Ratio Perm	c0.11				0.00							
v/c Ratio	0.66	0.13			0.02		0.73	0.24		0.05	0.34	
Uniform Delay, d1	39.1	35.6			34.7		39.8	5.2		47.9	11.7	
Progression Factor	1.00	1.00			1.00		0.95	1.47		1.00	1.00	
Incremental Delay, d2	6.8	0.2			0.0		7.7	0.2		0.2	0.5	
Delay (s)	45.9	35.8			34.8		45.5	7.9		48.1	12.2	
Level of Service	D	D			C		D	A		D	B	
Approach Delay (s)		40.1			34.8			17.7			12.3	
Approach LOS		D			C			B			B	

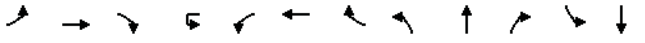
Intersection Summary				
HCM 2000 Control Delay	20.1	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.47			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.6	
Intersection Capacity Utilization	55.3%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
22: Novato Blvd #3 & Arthur Street

02/15/2018

Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	93	124	153	842	7	725	87
Future Volume (vph)	93	124	153	842	7	725	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5	3.5	4.9	3.5	4.9	
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	0.95	
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	1.00	0.98	
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1797	1589	1805	3574	1805	3552	
Flt Permitted	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (perm)	1797	1589	1805	3574	1805	3552	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	98	131	161	886	7	763	92
RTOR Reduction (vph)	0	115	0	0	0	5	0
Lane Group Flow (vph)	98	16	161	886	7	850	0
Confl. Peds. (#/hr)	4	2					
Confl. Bikes (#/hr)		1					
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%	0%
Turn Type	Perm	Perm	Prot	NA	Prot	NA	
Protected Phases			1	6	5	2	
Permitted Phases	4	4					
Actuated Green, G (s)	12.5	12.5	13.5	74.4	1.2	62.1	
Effective Green, g (s)	12.5	12.5	13.5	74.4	1.2	62.1	
Actuated g/C Ratio	0.12	0.12	0.14	0.74	0.01	0.62	
Clearance Time (s)	3.5	3.5	3.5	4.9	3.5	4.9	
Vehicle Extension (s)	2.0	2.0	2.0	4.0	2.0	4.0	
Lane Grp Cap (vph)	224	198	243	2659	21	2205	
v/s Ratio Prot			c0.09	0.25	0.00	c0.24	
v/s Ratio Perm	c0.05	0.01					
v/c Ratio	0.44	0.08	0.66	0.33	0.33	0.39	
Uniform Delay, d1	40.5	38.7	41.1	4.4	49.0	9.4	
Progression Factor	1.00	1.00	0.85	1.43	0.87	0.83	
Incremental Delay, d2	0.5	0.1	3.5	0.2	3.3	0.5	
Delay (s)	41.0	38.7	38.4	6.5	45.9	8.3	
Level of Service	D	D	D	A	D	A	
Approach Delay (s)	39.7			11.4		8.6	
Approach LOS	D			B		A	

Intersection Summary				
HCM 2000 Control Delay	13.3	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.43			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.9	
Intersection Capacity Utilization	48.3%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				



Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	40	126	15	28	226	196	581	27	359	182	430	381
Future Volume (vph)	40	126	15	28	226	196	581	27	359	182	430	381
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5			3.5	4.1	4.1	3.5	4.1		3.5	4.4
Lane Util. Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00		0.97	1.00
Frpb, ped/bikes	1.00	0.99			1.00	1.00	0.99	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	1.00
Frt	1.00	0.98			1.00	1.00	0.85	1.00	0.95		1.00	0.98
Flt Protected	0.95	1.00			0.95	1.00	1.00	0.95	1.00		0.95	1.00
Satd. Flow (prot)	1805	1860			1789	1900	1592	1805	1775		3502	1851
Flt Permitted	0.95	1.00			0.95	1.00	1.00	0.95	1.00		0.95	1.00
Satd. Flow (perm)	1805	1860			1789	1900	1592	1805	1775		3502	1851
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	42	133	16	29	238	206	612	28	378	192	453	401
RTOR Reduction (vph)	0	5	0	0	0	0	397	0	16	0	0	5
Lane Group Flow (vph)	42	144	0	0	267	206	215	28	554	0	453	462
Confl. Peds. (#/hr)			13				2			5		
Confl. Bikes (#/hr)			1							1		
Heavy Vehicles (%)	0%	0%	0%	0%	1%	0%	0%	0%	1%	1%	0%	0%
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Prot	NA		Prot	NA
Protected Phases	3	8		7	7	4		1	6		5	2
Permitted Phases							4					
Actuated Green, G (s)	6.0	15.6			15.5	24.5	24.5	6.0	38.0		16.3	48.0
Effective Green, g (s)	6.0	15.6			15.5	24.5	24.5	6.0	38.0		16.3	48.0
Actuated g/C Ratio	0.06	0.16			0.16	0.24	0.24	0.06	0.38		0.16	0.48
Clearance Time (s)	3.5	3.5			3.5	4.1	4.1	3.5	4.1		3.5	4.4
Vehicle Extension (s)	2.0	2.0			2.0	2.0	2.0	2.0	3.0		2.0	2.0
Lane Grp Cap (vph)	108	290			277	465	390	108	674		570	888
v/s Ratio Prot	0.02	c0.08			c0.15	0.11		0.02	c0.31		c0.13	0.25
v/s Ratio Perm							c0.13					
v/c Ratio	0.39	0.50			0.96	0.44	0.55	0.26	0.82		0.79	0.52
Uniform Delay, d1	45.2	38.6			42.0	32.0	32.9	44.9	27.9		40.2	18.0
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00		0.70	0.51
Incremental Delay, d2	0.8	0.5			43.7	0.2	1.0	0.5	8.0		10.5	2.1
Delay (s)	46.1	39.1			85.6	32.2	33.9	45.3	35.9		38.5	11.3
Level of Service	D	D			F	C	C	D	D		D	B
Approach Delay (s)		40.6				46.3			36.4			24.7
Approach LOS		D				D			D			C

Intersection Summary				
HCM 2000 Control Delay	36.7	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.80			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.5	
Intersection Capacity Utilization	84.0%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

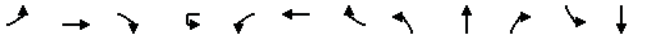
HCM Signalized Intersection Capacity Analysis
23: Novato Blvd #3 & Rowland Boulevard 02/15/2018

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	63
Future Volume (vph)	63
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.95
Adj. Flow (vph)	66
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	6
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	0%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Novato General Plan Update EIR W-Trans
PM Peak Hour Existing plus Project

HCM Signalized Intersection Capacity Analysis
24: Rowland Boulevard & Redwood Blvd 02/15/2018



Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	113	632	47	1	135	930	434	23	29	61	396	26
Future Volume (vph)	113	632	47	1	135	930	434	23	29	61	396	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.5	4.5		3.5	4.5		3.5	4.1		3.5	4.8
Lane Util. Factor	1.00	0.95	1.00		1.00	0.95		1.00	0.95		0.97	1.00
Frpb, ped/bikes	1.00	1.00	0.98		1.00	1.00		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	1.00
Frt	1.00	1.00	0.85		1.00	0.95		1.00	0.90		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00		0.95	1.00		0.95	1.00
Satd. Flow (prot)	1805	3574	1590		1805	3421		1805	3211		3502	1900
Flt Permitted	0.95	1.00	1.00		0.95	1.00		0.95	1.00		0.95	1.00
Satd. Flow (perm)	1805	3574	1590		1805	3421		1805	3211		3502	1900
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	119	665	49	1	142	979	457	24	31	64	417	27
RTOR Reduction (vph)	0	0	29	0	0	41	0	0	54	0	0	0
Lane Group Flow (vph)	119	665	20	0	143	1395	0	24	41	0	417	27
Confl. Peds. (#/hr)			4				4			3		
Confl. Bikes (#/hr)										1		
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	Prot	NA		Prot	NA		Prot	NA
Protected Phases	5	2		1	1	6		3	8		7	4
Permitted Phases			2									
Actuated Green, G (s)	11.2	38.2	38.2		12.7	39.7		4.0	13.9		12.8	22.0
Effective Green, g (s)	11.2	38.2	38.2		12.7	39.7		4.0	13.9		12.8	22.0
Actuated g/C Ratio	0.12	0.41	0.41		0.14	0.43		0.04	0.15		0.14	0.24
Clearance Time (s)	3.5	4.5	4.5		3.5	4.5		3.5	4.1		3.5	4.8
Vehicle Extension (s)	2.0	4.0	4.0		2.0	4.0		2.0	2.5		2.5	2.5
Lane Grp Cap (vph)	216	1464	651		245	1457		77	478		480	448
v/s Ratio Prot	0.07	0.19			c0.08	c0.41		0.01	0.01		c0.12	0.01
v/s Ratio Perm			0.01									
v/c Ratio	0.55	0.45	0.03		0.58	0.96		0.31	0.08		0.87	0.06
Uniform Delay, d1	38.6	19.9	16.4		37.8	25.9		43.3	34.2		39.4	27.6
Progression Factor	1.00	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	1.7	0.3	0.0		2.3	14.6		0.8	0.1		15.2	0.0
Delay (s)	40.4	20.2	16.5		40.0	40.5		44.1	34.2		54.5	27.6
Level of Service	D	C	B		D	D		D	C		D	C
Approach Delay (s)		22.9				40.5			36.2			46.5
Approach LOS		C				D			D			D

Intersection Summary				
HCM 2000 Control Delay	36.8	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.75			
Actuated Cycle Length (s)	93.2	Sum of lost time (s)	16.3	
Intersection Capacity Utilization	78.6%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
24: Rowland Boulevard & Redwood Blvd 02/15/2018

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	144
Future Volume (vph)	144
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.8
Lane Util. Factor	1.00
Frpb, ped/bikes	0.99
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1593
Flt Permitted	1.00
Satd. Flow (perm)	1593
Peak-hour factor, PHF	0.95
Adj. Flow (vph)	152
RTOR Reduction (vph)	116
Lane Group Flow (vph)	36
Confl. Peds. (#/hr)	2
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	0%
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	22.0
Effective Green, g (s)	22.0
Actuated g/C Ratio	0.24
Clearance Time (s)	4.8
Vehicle Extension (s)	2.5
Lane Grp Cap (vph)	376
v/s Ratio Prot	
v/s Ratio Perm	c0.02
v/c Ratio	0.10
Uniform Delay, d1	27.8
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	27.9
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary

Novato General Plan Update EIR W-Trans
PM Peak Hour Existing plus Project

HCM Signalized Intersection Capacity Analysis
25: Rowland Boulevard & Highway 101 SB Ramps 02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	516	585	737	1305	0	0	0	0	309	6	173
Future Volume (vph)	0	516	585	737	1305	0	0	0	0	309	6	173
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	3.0	4.0					3.0	3.0	
Lane Util. Factor		0.91	0.91	0.97	0.95					0.91	0.91	
Frpb, ped/bikes		1.00	0.99	1.00	1.00					1.00	0.99	
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	
Frt		0.95	0.85	1.00	1.00					1.00	0.92	
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.98	
Satd. Flow (prot)		3254	1450	3502	3610					1643	3062	
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.98	
Satd. Flow (perm)		3254	1450	3502	3610					1643	3062	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	543	616	776	1374	0	0	0	0	325	6	182
RTOR Reduction (vph)	0	56	231	0	0	0	0	0	0	0	15	0
Lane Group Flow (vph)	0	746	126	776	1374	0	0	0	0	179	319	0
Confl. Peds. (#/hr)			2									7
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	33%	0%
Turn Type		NA	Perm	Prot	NA					Split	NA	
Protected Phases		2		1	6					4	4	
Permitted Phases			2									
Actuated Green, G (s)		20.1	20.1	13.5	36.6					13.4	13.4	
Effective Green, g (s)		20.1	20.1	13.5	36.6					13.4	13.4	
Actuated g/C Ratio		0.35	0.35	0.24	0.64					0.24	0.24	
Clearance Time (s)		4.0	4.0	3.0	4.0					3.0	3.0	
Vehicle Extension (s)		4.0	4.0	2.0	2.5					2.0	2.0	
Lane Grp Cap (vph)		1147	511	829	2318					386	719	
v/s Ratio Prot		0.23		c0.22	c0.38					c0.11	0.10	
v/s Ratio Perm			0.09									
v/c Ratio		0.65	0.25	0.94	0.59					0.46	0.44	
Uniform Delay, d1		15.5	13.1	21.3	5.9					18.7	18.6	
Progression Factor		1.00	1.00	1.00	1.00					1.00	1.00	
Incremental Delay, d2		1.5	0.3	17.3	0.3					0.3	0.2	
Delay (s)		17.0	13.4	38.7	6.2					19.0	18.8	
Level of Service		B	B	D	A					B	B	
Approach Delay (s)		15.9			17.9			0.0			18.9	
Approach LOS		B			B			A			B	

Intersection Summary				
HCM 2000 Control Delay	17.4	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.69			
Actuated Cycle Length (s)	57.0	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	69.6%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
26: Highway 101 NB Ramps & Rowland Boulevard 02/15/2018

Movement	EBL2	EBL	EBT	WBT	WBR	WBR2	NBL2	NBL	NBT	NBR	NEL2	NEL
Lane Configurations												
Traffic Volume (vph)	3	93	740	1215	1	499	801	11	1	778	18	18
Future Volume (vph)	3	93	740	1215	1	499	801	11	1	778	18	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	4.0	4.0		4.0	3.5		3.5	3.0		3.5
Lane Util. Factor		1.00	0.95	0.86		0.86	0.95		0.95	0.88		1.00
Frpb, ped/bikes		1.00	1.00	1.00		1.00	1.00		1.00	1.00		1.00
Flpb, ped/bikes		1.00	1.00	1.00		1.00	1.00		1.00	1.00		1.00
Frt		1.00	1.00	0.99		0.85	1.00		1.00	0.85		0.98
Flt Protected		0.95	1.00	1.00		1.00	0.95		0.95	1.00		0.96
Satd. Flow (prot)		1804	3574	4640		1323	1715		1718	2842		1745
Flt Permitted		0.95	1.00	1.00		1.00	0.95		0.95	1.00		0.96
Satd. Flow (perm)		1804	3574	4640		1323	1715		1718	2842		1745
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	3	98	779	1279	1	525	843	12	1	819	19	19
RTOR Reduction (vph)	0	0	0	8	0	213	0	0	0	0	0	0
Lane Group Flow (vph)	0	101	779	1393	0	191	430	0	426	819	0	43
Confl. Peds. (#/hr)					1					8		
Heavy Vehicles (%)	2%	0%	1%	4%	0%	5%	0%	2%	13%	0%	2%	0%
Turn Type	Prot	Prot	NA	NA		Perm	Split	Split	NA	custom	Perm	Prot
Protected Phases	5	5	2	6			8	8	8	1 8		7
Permitted Phases						6					7	
Actuated Green, G (s)		10.1	49.4	50.7		50.7	36.4		36.4	47.8		8.8
Effective Green, g (s)		10.1	49.4	50.7		50.7	36.4		36.4	47.8		8.8
Actuated g/C Ratio		0.08	0.41	0.42		0.42	0.30		0.30	0.40		0.07
Clearance Time (s)		3.0	4.0	4.0		4.0	3.5		3.5			3.5
Vehicle Extension (s)		2.0	2.0	2.0		2.0	2.0		2.0			2.0
Lane Grp Cap (vph)		151	1471	1960		558	520		521	1132		127
v/s Ratio Prot		0.06	0.22	c0.30			c0.25		0.25	c0.29		
v/s Ratio Perm						0.14						0.02
v/c Ratio		0.67	0.53	0.71		0.34	0.83		0.82	0.72		0.34
Uniform Delay, d1		53.3	26.6	28.6		23.4	38.9		38.7	30.5		52.8
Progression Factor		1.00	1.00	0.90		1.38	1.00		1.00	1.00		1.00
Incremental Delay, d2		8.4	1.4	1.9		1.5	9.9		9.2	2.0		0.6
Delay (s)		61.7	27.9	27.6		33.7	48.8		47.9	32.5		53.4
Level of Service		E	C	C		C	D		D	C		D
Approach Delay (s)			31.8	29.0					40.6			53.4
Approach LOS			C	C					D			D

Intersection Summary				
HCM 2000 Control Delay	34.2	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.0	
Intersection Capacity Utilization	79.7%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
26: Highway 101 NB Ramps & Rowland Boulevard 02/15/2018

Movement	NER
Lane Configurations	
Traffic Volume (vph)	5
Future Volume (vph)	5
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.95
Adj. Flow (vph)	5
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	15%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM Signalized Intersection Capacity Analysis
27: Rowland Boulevard & Rowland Way 02/15/2018

Movement	EBU	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Volume (vph)	6	225	1289	1372	26	36	339
Future Volume (vph)	6	225	1289	1372	26	36	339
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	4.0	4.0		3.2	3.2
Lane Util. Factor		0.97	0.91	0.95		1.00	0.95
Frpb, ped/bikes		1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00		1.00	1.00
Frt		1.00	1.00	1.00		0.88	0.85
Flt Protected		0.95	1.00	1.00		0.99	1.00
Satd. Flow (prot)		3468	5187	3593		1634	1519
Flt Permitted		0.95	1.00	1.00		0.99	1.00
Satd. Flow (perm)		3468	5187	3593		1634	1519
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	6	232	1329	1414	27	37	349
RTOR Reduction (vph)	0	0	0	1	0	140	171
Lane Group Flow (vph)	0	238	1329	1440	0	54	21
Confl. Peds. (#/hr)					12	2	
Heavy Vehicles (%)	0%	1%	0%	0%	7%	2%	1%
Turn Type	Prot	Prot	NA	NA		Prot	Perm
Protected Phases	5	5	2	6		4	
Permitted Phases							4
Actuated Green, G (s)		12.8	99.8	83.5		13.0	13.0
Effective Green, g (s)		12.8	99.8	83.5		13.0	13.0
Actuated g/C Ratio		0.11	0.83	0.70		0.11	0.11
Clearance Time (s)		3.5	4.0	4.0		3.2	3.2
Vehicle Extension (s)		2.0	4.0	4.0		2.0	2.0
Lane Grp Cap (vph)		369	4313	2500		177	164
v/s Ratio Prot		c0.07	0.26	c0.40		c0.03	
v/s Ratio Perm							0.01
v/c Ratio		0.64	0.31	0.58		0.31	0.13
Uniform Delay, d1		51.4	2.3	9.3		49.3	48.4
Progression Factor		1.02	1.20	0.99		1.00	1.00
Incremental Delay, d2		2.4	0.2	0.9		0.4	0.1
Delay (s)		54.7	2.9	10.0		49.7	48.5
Level of Service		D	A	A		D	D
Approach Delay (s)			10.8	10.0		49.1	
Approach LOS			B	A		D	

Intersection Summary			
HCM 2000 Control Delay	14.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.7
Intersection Capacity Utilization	71.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
28: Rowland Boulevard & Vintage Way

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	489	811	2	576	6	822	3	2	4	3	0
Future Volume (vph)	17	489	811	2	576	6	822	3	2	4	3	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0	4.0	3.0	4.0		3.6	3.6			3.2	
Lane Util. Factor	1.00	0.95	0.88	1.00	0.95		0.97	1.00			1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	0.99			1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.94			1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00			0.97	
Satd. Flow (prot)	1805	3539	2842	1805	3567		3502	1768			1847	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00			0.97	
Satd. Flow (perm)	1805	3539	2842	1805	3567		3502	1768			1847	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	18	515	854	2	606	6	865	3	2	4	3	0
RTOR Reduction (vph)	0	0	0	0	1	0	0	1	0	0	0	0
Lane Group Flow (vph)	18	515	854	2	611	0	865	4	0	0	7	0
Confl. Peds. (#/hr)			9	9		13			11			
Confl. Bikes (#/hr)			2			2						
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Prot	NA	pt+ov	Prot	NA		Split	NA		Split	NA	
Protected Phases	5	2	2 3	1	6		3	3		4	4	
Permitted Phases												
Actuated Green, G (s)	5.4	49.6	105.0	2.8	47.0		51.4	51.4			2.4	
Effective Green, g (s)	5.4	49.6	105.0	2.8	47.0		51.4	51.4			2.4	
Actuated g/C Ratio	0.05	0.41	0.88	0.02	0.39		0.43	0.43			0.02	
Clearance Time (s)	3.0	4.0		3.0	4.0		3.6	3.6			3.2	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		3.0	3.0			2.0	
Lane Grp Cap (vph)	81	1462	2486	42	1397		1500	757			36	
v/s Ratio Prot	0.01	0.15	c0.30	0.00	c0.17		c0.25	0.00			c0.00	
v/s Ratio Perm												
v/c Ratio	0.22	0.35	0.34	0.05	0.44		0.58	0.01			0.19	
Uniform Delay, d1	55.3	24.2	1.3	57.3	26.8		26.0	19.7			57.8	
Progression Factor	1.19	1.20	0.93	1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.5	0.6	0.4	0.2	1.0		1.6	0.0			1.0	
Delay (s)	66.5	29.6	1.6	57.5	27.8		27.7	19.7			58.8	
Level of Service	E	C	A	E	C		C	B			E	
Approach Delay (s)		12.8			27.9			27.6			58.8	
Approach LOS		B			C			C			E	

Intersection Summary				
HCM 2000 Control Delay	20.6	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.50			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.8	
Intersection Capacity Utilization	60.1%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
29: Novato Blvd #3 & Sunset Parkway

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	206	18	33	30	11	36	44	291	51	34	322	217
Future Volume (vph)	206	18	33	30	11	36	44	291	51	34	322	217
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.0		3.5	3.5		3.5	4.9		3.5	4.6	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.98		1.00	0.98		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.90		1.00	0.89		1.00	0.98		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	1674		1805	1642		1805	1835		1805	1778	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1787	1674		1805	1642		1805	1835		1805	1778	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	217	19	35	32	12	38	46	306	54	36	339	228
RTOR Reduction (vph)	0	27	0	0	34	0	0	5	0	0	19	0
Lane Group Flow (vph)	217	27	0	32	16	0	46	355	0	36	548	0
Confl. Peds. (#/hr)			11			6			3			
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	1%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases												
Actuated Green, G (s)	12.9	17.8		3.4	8.8		5.2	38.5		5.2	38.8	
Effective Green, g (s)	12.9	17.8		3.4	8.8		5.2	38.5		5.2	38.8	
Actuated g/C Ratio	0.16	0.22		0.04	0.11		0.06	0.48		0.06	0.48	
Clearance Time (s)	3.5	4.0		3.5	3.5		3.5	4.9		3.5	4.6	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	285	368		75	178		116	874		116	853	
v/s Ratio Prot	c0.12	0.02		0.02	c0.01		c0.03	0.19		0.02	c0.31	
v/s Ratio Perm												
v/c Ratio	0.76	0.07		0.43	0.09		0.40	0.41		0.31	0.64	
Uniform Delay, d1	32.5	25.0		37.7	32.4		36.3	13.7		36.1	15.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	10.3	0.0		1.4	0.1		0.8	1.4		0.6	3.7	
Delay (s)	42.8	25.0		39.2	32.5		37.1	15.1		36.6	19.5	
Level of Service	D	C		D	C		D	B		D	B	
Approach Delay (s)		39.2			35.1			17.6			20.5	
Approach LOS		D			D			B			C	

Intersection Summary				
HCM 2000 Control Delay	24.3	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.58			
Actuated Cycle Length (s)	80.8	Sum of lost time (s)	15.9	
Intersection Capacity Utilization	63.2%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM 2010 AWSC
30: Redwood Blvd & Novato Blvd #3 02/15/2018

Intersection	
Intersection Delay, s/veh	41.1
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	44	263	69	72	357	109	117	13	139	84	10	46
Future Vol, veh/h	44	263	69	72	357	109	117	13	139	84	10	46
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	1	2	1	1	2	1	1	1	1	1	1	1
Mvmt Flow	46	277	73	76	376	115	123	14	146	88	11	48
Number of Lanes	1	1	0	1	1	0	1	1	1	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	3	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	2	2	2
HCM Control Delay	31.1	67.8	15.3	14.5
HCM LOS	D	F	C	B

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	100%	0%	0%	79%	0%	77%	0%	18%
Vol Right, %	0%	0%	100%	0%	21%	0%	23%	0%	82%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	117	13	139	44	332	72	466	84	56
LT Vol	117	0	0	44	0	72	0	84	0
Through Vol	0	13	0	0	263	0	357	0	10
RT Vol	0	0	139	0	69	0	109	0	46
Lane Flow Rate	123	14	146	46	349	76	491	88	59
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.313	0.033	0.326	0.111	0.776	0.175	1.028	0.235	0.139
Departure Headway (Hd)	9.375	8.857	8.132	8.635	7.991	8.303	7.543	9.888	8.764
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	385	407	445	413	451	436	481	365	411
Service Time	7.075	6.557	5.832	6.428	5.784	5.985	5.325	7.588	6.464
HCM Lane V/C Ratio	0.319	0.034	0.328	0.111	0.774	0.174	1.021	0.241	0.144
HCM Control Delay	16.3	11.9	14.7	12.5	33.6	12.7	76.3	15.6	12.9
HCM Lane LOS	C	B	B	B	D	B	F	C	B
HCM 95th-tile Q	1.3	0.1	1.4	0.4	6.7	0.6	14.3	0.9	0.5

HCM Signalized Intersection Capacity Analysis
30: Redwood Blvd & Novato Blvd #3 02/16/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	263	69	72	357	109	117	13	139	84	10	46
Future Volume (vph)	44	263	69	72	357	109	117	13	139	84	10	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	16	12	16	16	12	12	12	12	12	12
Total Lost time (s)	3.5	4.0		3.5	4.0		3.5	4.0	4.0	3.5	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	0.96		1.00	1.00	0.85	1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1787	2049		1787	2042		1787	1881	1599	1787	1652	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1787	2049		1787	2042		1787	1881	1599	1787	1652	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	46	277	73	76	376	115	123	14	146	88	11	48
RTOR Reduction (vph)	0	9	0	0	11	0	0	0	123	0	44	0
Lane Group Flow (vph)	46	341	0	76	480	0	123	14	23	88	16	0
Heavy Vehicles (%)	1%	2%	1%	1%	2%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	3.0	20.4		4.1	21.5		9.8	8.6	8.6	6.3	5.1	
Effective Green, g (s)	3.0	20.4		4.1	21.5		9.8	8.6	8.6	6.3	5.1	
Actuated g/C Ratio	0.06	0.37		0.08	0.40		0.18	0.16	0.16	0.12	0.09	
Clearance Time (s)	3.5	4.0		3.5	4.0		3.5	4.0	4.0	3.5	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	98	768		134	807		321	297	252	206	154	
v/s Ratio Prot	0.03	0.17		c0.04	c0.23		c0.07	0.01		0.05	0.01	
v/s Ratio Perm									c0.01			
v/c Ratio	0.47	0.44		0.57	0.59		0.38	0.05	0.09	0.43	0.10	
Uniform Delay, d1	24.9	12.7		24.3	13.0		19.6	19.4	19.6	22.4	22.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.5	0.4		5.4	1.2		0.8	0.1	0.2	1.4	0.3	
Delay (s)	28.5	13.2		29.7	14.2		20.4	19.5	19.7	23.8	22.8	
Level of Service	C	B		C	B		C	B	B	C	C	
Approach Delay (s)		14.9			16.3			20.0			23.4	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM 2000 Control Delay	17.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	54.4	Sum of lost time (s)	15.0
Intersection Capacity Utilization	51.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

MOVEMENT SUMMARY

Site: 30 [PM Existing + Project]

Novato Boulevard/Redwood Boulevard
PM Existing + Project

Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NB Redwood Boulevard											
3	L2	123	2.0	0.321	7.6	LOS A	1.6	39.6	0.58	0.52	32.5
8	T1	14	2.0	0.321	7.6	LOS A	1.6	39.6	0.58	0.52	32.5
18	R2	146	2.0	0.321	7.6	LOS A	1.6	39.6	0.58	0.52	31.6
Approach		283	2.0	0.321	7.6	LOS A	1.6	39.6	0.58	0.52	32.0
East: WB Novato Blvd											
1	L2	76	2.0	0.506	9.0	LOS A	3.4	87.3	0.52	0.37	32.6
6	T1	376	2.0	0.506	9.0	LOS A	3.4	87.3	0.52	0.37	32.6
16	R2	115	2.0	0.506	9.0	LOS A	3.4	87.3	0.52	0.37	31.7
Approach		566	2.0	0.506	9.0	LOS A	3.4	87.3	0.52	0.37	32.4
North: SB Redwood Boulevard											
7	L2	88	2.0	0.198	7.0	LOS A	0.8	21.2	0.60	0.57	32.4
4	T1	11	2.0	0.198	7.0	LOS A	0.8	21.2	0.60	0.57	32.4
14	R2	48	2.0	0.198	7.0	LOS A	0.8	21.2	0.60	0.57	31.5
Approach		147	2.0	0.198	7.0	LOS A	0.8	21.2	0.60	0.57	32.1
West: EB Novato Blvd											
5	L2	46	2.0	0.273	5.5	LOS A	1.3	33.3	0.36	0.23	34.3
2	T1	277	2.0	0.273	5.5	LOS A	1.3	33.3	0.36	0.23	34.3
12	R2	73	2.0	0.061	3.5	LOS A	0.2	6.1	0.29	0.16	34.5
Approach		396	2.0	0.273	5.2	LOS A	1.3	33.3	0.34	0.22	34.3
All Vehicles		1393	2.0	0.506	7.4	LOS A	3.4	87.3	0.49	0.38	32.8

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Organisation: W-TRANS | Processed: Tuesday, February 27, 2018 4:01:26 PM
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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	447	78	332	736	34	98	4	162	28	5	1
Future Volume (vph)	10	447	78	332	736	34	98	4	162	28	5	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.6	3.6	3.0	3.6			3.5	3.5		3.7	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00			1.00	0.98		1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00			0.99	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	0.99			1.00	0.85		1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00		0.96	
Satd. Flow (prot)	1770	3610	1573	1900	3586			1784	1589		1812	
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.76	1.00		0.76	
Satd. Flow (perm)	1770	3610	1573	1805	3586			1421	1589		1431	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	11	471	82	349	775	36	103	4	171	29	5	1
RTOR Reduction (vph)	0	0	30	0	2	0	0	0	146	0	1	0
Lane Group Flow (vph)	11	471	52	349	809	0	0	107	25	0	34	0
Confl. Peds. (#/hr)			4				7		4	4		7
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2				8		8	4		
Actuated Green, G (s)	1.2	47.6	47.6	27.4	73.8			14.9	14.9		14.7	
Effective Green, g (s)	1.2	47.6	47.6	27.4	73.8			14.9	14.9		14.7	
Actuated g/C Ratio	0.01	0.48	0.48	0.27	0.74			0.15	0.15		0.15	
Clearance Time (s)	3.0	3.6	3.6	3.0	3.6			3.5	3.5		3.7	
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0			2.0	2.0		2.0	
Lane Grp Cap (vph)	21	1718	748	520	2646			211	236		210	
v/s Ratio Prot	c0.01	0.13		c0.18	c0.23							
v/s Ratio Perm			0.03					c0.08	0.02		0.02	
v/c Ratio	0.52	0.27	0.07	0.67	0.31			0.51	0.11		0.16	
Uniform Delay, d1	49.1	15.8	14.2	32.3	4.4			39.2	36.8		37.3	
Progression Factor	1.00	1.00	1.00	0.73	0.74			1.00	1.00		1.00	
Incremental Delay, d2	10.4	0.4	0.2	2.4	0.3			0.7	0.1		0.1	
Delay (s)	59.5	16.2	14.4	26.1	3.6			39.9	36.9		37.4	
Level of Service	E	B	B	C	A			D	D		D	
Approach Delay (s)		16.8			10.3			38.0			37.4	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	16.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.3
Intersection Capacity Utilization	68.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
32: US 101 SB Off Ramp/Enfrente Rd & Ignacio Blvd/Ignacio Blvd #3 02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	394	264	664	817	139	0	0	783	189	89	296
Future Volume (vph)	33	394	264	664	817	139	0	0	783	189	89	296
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			2%			0%	
Total Lost time (s)	3.0	8.0	8.0	4.0	5.0				4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95				0.88		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.96	1.00	0.99				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	1.00	0.85	1.00	0.98				0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00				1.00		0.97	1.00
Satd. Flow (prot)	1805	3610	1550	1787	3504				2814		1809	1578
Flt Permitted	0.95	1.00	1.00	0.95	1.00				1.00		0.97	1.00
Satd. Flow (perm)	1805	3610	1550	1787	3504				2814		1809	1578
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)	34	410	275	692	851	145	0	0	816	197	93	308
RTOR Reduction (vph)	0	0	201	0	10	0	0	0	409	0	0	241
Lane Group Flow (vph)	34	410	74	692	986	0	0	0	407	0	290	67
Confl. Peds. (#/hr)			7			20						1
Confl. Bikes (#/hr)						3						
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	5%	1%
Turn Type	Prot	NA	Perm	Prot	NA				Over	Split	NA	Perm
Protected Phases	5	2		1	6				1	7	7	
Permitted Phases			2									7
Actuated Green, G (s)	6.6	26.9	26.9	35.2	59.5				35.2		21.9	21.9
Effective Green, g (s)	6.6	26.9	26.9	35.2	59.5				35.2		21.9	21.9
Actuated g/C Ratio	0.07	0.27	0.27	0.35	0.60				0.35		0.22	0.22
Clearance Time (s)	3.0	8.0	8.0	4.0	5.0				4.0		4.0	4.0
Vehicle Extension (s)	2.0	2.5	2.5	3.0	4.0				3.0		2.5	2.5
Lane Grp Cap (vph)	119	971	416	629	2084				990		396	345
v/s Ratio Prot	0.02	c0.11		c0.39	c0.28				0.14		c0.16	
v/s Ratio Perm			0.05									0.04
v/c Ratio	0.29	0.42	0.18	1.10	0.47				0.41		0.73	0.20
Uniform Delay, d1	44.5	30.1	28.1	32.4	11.4				24.5		36.3	31.9
Progression Factor	0.98	0.68	0.41	0.81	0.73				1.00		1.00	1.00
Incremental Delay, d2	0.5	1.3	0.9	56.9	0.4				0.3		6.5	0.2
Delay (s)	44.1	21.9	12.3	83.1	8.7				24.8		42.8	32.1
Level of Service	D	C	B	F	A				C		D	C
Approach Delay (s)		19.3			39.2			24.8			37.3	
Approach LOS		B			D			C			D	

Intersection Summary				
HCM 2000 Control Delay	32.1	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.82			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	82.7%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
32: US 101 SB Off Ramp/Enfrente Rd & Ignacio Blvd/Ignacio Blvd #3 02/16/2018

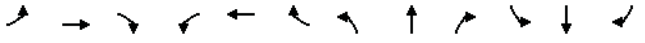
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	394	264	664	817	139	0	0	783	189	89	296
Future Volume (vph)	33	394	264	664	817	139	0	0	783	189	89	296
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			2%			0%	
Total Lost time (s)	3.0	8.0	8.0	4.0	5.0				4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95				0.88		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.96	1.00	0.99				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	1.00	0.85	1.00	0.98				0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00				1.00		0.97	1.00
Satd. Flow (prot)	1805	3610	1550	1787	3504				2814		1809	1578
Flt Permitted	0.95	1.00	1.00	0.95	1.00				1.00		0.97	1.00
Satd. Flow (perm)	1805	3610	1550	1787	3504				2814		1809	1578
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)	34	410	275	692	851	145	0	0	816	197	93	308
RTOR Reduction (vph)	0	0	201	0	10	0	0	0	409	0	0	241
Lane Group Flow (vph)	34	410	74	692	986	0	0	0	407	0	290	67
Confl. Peds. (#/hr)			7			20						1
Confl. Bikes (#/hr)						3						
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	5%	1%
Turn Type	Prot	NA	Perm	Prot	NA				Over	Split	NA	Perm
Protected Phases	5	2		1	6				1	7	7	
Permitted Phases			2									7
Actuated Green, G (s)	6.6	26.9	26.9	35.2	59.5				35.2		21.9	21.9
Effective Green, g (s)	6.6	26.9	26.9	35.2	59.5				35.2		21.9	21.9
Actuated g/C Ratio	0.07	0.27	0.27	0.35	0.60				0.35		0.22	0.22
Clearance Time (s)	3.0	8.0	8.0	4.0	5.0				4.0		4.0	4.0
Vehicle Extension (s)	2.0	2.5	2.5	3.0	4.0				3.0		2.5	2.5
Lane Grp Cap (vph)	119	971	416	629	2084				990		396	345
v/s Ratio Prot	0.02	c0.11		c0.39	c0.28				0.14		c0.16	
v/s Ratio Perm			0.05									0.04
v/c Ratio	0.29	0.42	0.18	1.10	0.47				0.41		0.73	0.20
Uniform Delay, d1	44.5	30.1	28.1	32.4	11.4				24.5		36.3	31.9
Progression Factor	0.93	0.65	0.36	0.82	0.72				1.00		1.00	1.00
Incremental Delay, d2	0.5	1.3	0.9	56.9	0.4				0.3		6.5	0.2
Delay (s)	41.9	20.8	11.0	83.5	8.6				24.8		42.8	32.1
Level of Service	D	C	B	F	A				C		D	C
Approach Delay (s)		18.1			39.3			24.8			37.3	
Approach LOS		B			D			C			D	

Intersection Summary				
HCM 2000 Control Delay	31.9	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.82			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	82.7%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
33: Nave Dr & Ignacio Blvd #3/Bel Marin Keys Blvd #3

02/15/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	359	1013	134	739	768	868	749	271	0	0	0
Future Volume (vph)	0	359	1013	134	739	768	868	749	271	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.6	3.0	4.0		4.6	4.6	3.0			
Lane Util. Factor		0.95	1.00	1.00	0.95		0.91	0.91	1.00			
Frpb, ped/bikes		1.00	0.99	1.00	0.99		1.00	1.00	0.99			
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00			
Frt		1.00	0.85	1.00	0.92		1.00	1.00	0.85			
Flt Protected		1.00	1.00	0.95	1.00		0.95	0.98	1.00			
Satd. Flow (prot)		3610	1605	1805	3278		1643	3382	1600			
Flt Permitted		1.00	1.00	0.95	1.00		0.95	0.98	1.00			
Satd. Flow (perm)		3610	1605	1805	3278		1643	3382	1600			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	378	1066	141	778	808	914	788	285	0	0	0
RTOR Reduction (vph)	0	0	72	0	42	0	0	0	115	0	0	0
Lane Group Flow (vph)	0	378	994	141	1544	0	558	1144	170	0	0	0
Confl. Peds. (#/hr)			1			1			1			
Heavy Vehicles (%)	0%	0%	0%	0%	0%	2%	0%	1%	0%	0%	0%	0%
Turn Type		NA	pm+ov	Prot	NA		Split	NA	pm+ov			
Protected Phases		2	3	1	6		3	3	1			
Permitted Phases			2						3			
Actuated Green, G (s)		35.8	75.6	12.8	51.6		39.8	39.8	52.6			
Effective Green, g (s)		35.8	75.6	12.8	51.6		39.8	39.8	52.6			
Actuated g/C Ratio		0.36	0.76	0.13	0.52		0.40	0.40	0.53			
Clearance Time (s)		4.0	4.6	3.0	4.0		4.6	4.6	3.0			
Vehicle Extension (s)		4.0	2.0	2.0	4.0		2.0	2.0	2.0			
Lane Grp Cap (vph)		1292	1213	231	1691		653	1346	841			
v/s Ratio Prot		0.10	0.33	0.08	c0.47		c0.34	0.34	0.03			
v/s Ratio Perm			0.29						0.08			
v/c Ratio		0.29	0.82	0.61	0.95dr		0.85	0.85	0.20			
Uniform Delay, d1		23.0	7.8	41.2	22.2		27.5	27.4	12.6			
Progression Factor		1.08	1.00	1.00	1.00		1.00	1.00	1.00			
Incremental Delay, d2		0.5	3.7	3.3	9.1		10.2	5.0	0.0			
Delay (s)		25.4	11.5	44.6	31.2		37.7	32.4	12.6			
Level of Service		C	B	D	C		D	C	B			
Approach Delay (s)		15.1			32.3			31.0			0.0	
Approach LOS		B			C			C			A	

Intersection Summary				
HCM 2000 Control Delay	27.0	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.92			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.6	
Intersection Capacity Utilization	82.9%	ICU Level of Service	E	
Analysis Period (min)	15			

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
34: Bel Marin Keys Blvd #3 & Commercial Blvd

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	0	38	278	1	28	46	538	78	31	1429	7
Future Volume (vph)	3	0	38	278	1	28	46	538	78	31	1429	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	3.0	3.9		3.0	3.5	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			1.00	0.99	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.87			1.00	0.85	1.00	0.98		1.00	1.00	
Flt Protected		1.00			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1632			1807	1396	1805	3530		1805	3572	
Flt Permitted		0.98			0.69	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1607			1316	1396	1805	3530		1805	3572	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	3	0	42	309	1	31	51	598	87	34	1588	8
RTOR Reduction (vph)	0	32	0	0	0	22	0	12	0	0	0	0
Lane Group Flow (vph)	0	13	0	0	310	9	51	673	0	34	1596	0
Confl. Peds. (#/hr)	3		2	2		3			3			
Heavy Vehicles (%)	2%	0%	0%	0%	0%	14%	0%	0%	0%	0%	1%	0%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		22.1			22.1	22.1	4.2	38.4		3.6	38.2	
Effective Green, g (s)		22.1			22.1	22.1	4.2	38.4		3.6	38.2	
Actuated g/C Ratio		0.29			0.29	0.29	0.06	0.51		0.05	0.51	
Clearance Time (s)		4.0			4.0	4.0	3.0	3.9		3.0	3.5	
Vehicle Extension (s)		3.0			3.0	3.0	2.5	3.0		2.5	4.0	
Lane Grp Cap (vph)		473			387	411	101	1807		86	1819	
v/s Ratio Prot							c0.03	0.19		0.02	c0.45	
v/s Ratio Perm		0.01			c0.24	0.01						
v/c Ratio		0.03			0.80	0.02	0.50	0.37		0.40	0.88	
Uniform Delay, d1		18.8			24.4	18.8	34.4	11.0		34.6	16.3	
Progression Factor		1.00			1.00	1.00	1.00	1.00		0.91	0.79	
Incremental Delay, d2		0.0			11.3	0.0	2.9	0.6		1.4	4.2	
Delay (s)		18.8			35.7	18.8	37.3	11.6		32.9	17.1	
Level of Service		B			D	B	D	B		C	B	
Approach Delay (s)		18.8			34.2			13.4			17.5	
Approach LOS		B			C			B			B	

Intersection Summary				
HCM 2000 Control Delay	18.5	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.83			
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	10.9	
Intersection Capacity Utilization	68.6%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
35: Bel Marin Keys Blvd #3 & Hamilton Dr/Digital Dr

02/23/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	7	154	606	4	13	45	381	127	6	713	2
Future Volume (vph)	5	7	154	606	4	13	45	381	127	6	713	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	3.5	3.5	3.5		3.0	4.0		3.0	4.0	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.98	1.00	0.99		1.00	0.99		1.00	1.00	
Flpb, ped/bikes		1.00	1.00	0.99	1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85	1.00	0.88		1.00	0.96		1.00	1.00	
Flt Protected		0.98	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1864	1522	1739	1662		1770	3375		1805	3538	
Flt Permitted		0.96	1.00	0.75	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1823	1522	1371	1662		1770	3375		1805	3538	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	8	167	659	4	14	49	414	138	7	775	2
RTOR Reduction (vph)	0	0	99	0	8	0	0	37	0	0	0	0
Lane Group Flow (vph)	0	13	68	659	10	0	49	515	0	7	777	0
Confl. Peds. (#/hr)	1		10	10		1			2			8
Confl. Bikes (#/hr)									5			5
Heavy Vehicles (%)	0%	0%	4%	3%	0%	0%	2%	2%	3%	0%	2%	0%
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8								
Actuated Green, G (s)		30.5	30.5	30.5	30.5		5.4	32.2		1.8	28.6	
Effective Green, g (s)		30.5	30.5	30.5	30.5		5.4	32.2		1.8	28.6	
Actuated g/C Ratio		0.41	0.41	0.41	0.41		0.07	0.43		0.02	0.38	
Clearance Time (s)		3.5	3.5	3.5	3.5		3.0	4.0		3.0	4.0	
Vehicle Extension (s)		2.0	2.0	2.5	2.5		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)		741	618	557	675		127	1449		43	1349	
v/s Ratio Prot					0.01		c0.03	0.15		0.00	c0.22	
v/s Ratio Perm		0.01	0.04	c0.48								
v/c Ratio		0.02	0.11	1.18	0.01		0.39	0.36		0.16	0.58	
Uniform Delay, d1		13.3	13.8	22.2	13.3		33.2	14.4		35.9	18.4	
Progression Factor		1.00	1.00	1.00	1.00		0.80	1.60		1.00	1.00	
Incremental Delay, d2		0.0	0.0	99.7	0.0		0.7	0.7		0.7	1.8	
Delay (s)		13.3	13.8	121.9	13.3		27.2	23.7		36.5	20.2	
Level of Service		B	B	F	B		C	C		D	C	
Approach Delay (s)		13.8			119.0			24.0			20.3	
Approach LOS		B			F			C			C	

Intersection Summary				
HCM 2000 Control Delay	50.6	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.85			
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	10.5	
Intersection Capacity Utilization	78.6%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
36: Nave Dr & US 101 NB Off Ramp

02/15/2018

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	720	233	0	1177	894	238
Future Volume (vph)	720	233	0	1177	894	238
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		5.0	5.0	
Lane Util. Factor	0.97	1.00		0.95	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	0.97	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3467	1563		3574	3469	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3467	1563		3574	3469	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	735	238	0	1201	912	243
RTOR Reduction (vph)	0	39	0	0	34	0
Lane Group Flow (vph)	735	199	0	1201	1121	0
Confl. Peds. (#/hr)		1				
Heavy Vehicles (%)	1%	2%	0%	1%	1%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	31.0	31.0		31.0	31.0	
Effective Green, g (s)	31.0	31.0		31.0	31.0	
Actuated g/C Ratio	0.44	0.44		0.44	0.44	
Clearance Time (s)	3.0	3.0		5.0	5.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	1535	692		1582	1536	
v/s Ratio Prot	c0.21			c0.34	0.32	
v/s Ratio Perm		0.13				
v/c Ratio	0.48	0.29		0.76	0.73	
Uniform Delay, d1	13.8	12.4		16.4	16.1	
Progression Factor	1.00	1.00		0.50	1.00	
Incremental Delay, d2	1.1	1.0		2.6	3.1	
Delay (s)	14.9	13.5		10.7	19.1	
Level of Service	B	B		B	B	
Approach Delay (s)	14.5			10.7	19.1	
Approach LOS	B			B	B	

Intersection Summary				
HCM 2000 Control Delay	14.7	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.62			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	62.5%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
37: Nave Dr & Hamilton Center

02/15/2018

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	114	43	901	127	140	785
Future Volume (vph)	114	43	901	127	140	785
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.2	3.2	4.4		3.0	4.4
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.98		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	1615	1863		1770	1881
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1805	1615	1863		1770	1881
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	119	45	939	132	146	818
RTOR Reduction (vph)	0	41	6	0	0	0
Lane Group Flow (vph)	119	4	1065	0	146	818
Confl. Peds. (#/hr)				2		
Heavy Vehicles (%)	0%	0%	0%	0%	2%	1%
Turn Type	Prot	Perm	NA		Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8				
Actuated Green, G (s)	6.4	6.4	45.0		8.0	56.0
Effective Green, g (s)	6.4	6.4	45.0		8.0	56.0
Actuated g/C Ratio	0.09	0.09	0.64		0.11	0.80
Clearance Time (s)	3.2	3.2	4.4		3.0	4.4
Vehicle Extension (s)	1.0	1.0	1.0		1.0	1.0
Lane Grp Cap (vph)	165	147	1197		202	1504
v/s Ratio Prot	c0.07		c0.57		c0.08	0.43
v/s Ratio Perm		0.00				
v/c Ratio	0.72	0.03	0.89		0.72	0.54
Uniform Delay, d1	30.9	29.0	10.4		29.9	2.5
Progression Factor	1.00	1.00	0.81		1.08	0.89
Incremental Delay, d2	12.3	0.0	8.6		7.9	1.1
Delay (s)	43.3	29.0	17.0		40.1	3.3
Level of Service	D	C	B		D	A
Approach Delay (s)	39.4		17.0			8.8
Approach LOS	D		B			A

Intersection Summary				
HCM 2000 Control Delay	15.1	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.85			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	10.6	
Intersection Capacity Utilization	79.6%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
38: Nave Dr & Hamilton Pkwy

02/15/2018

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	90	384	525	54	325	439
Future Volume (vph)	90	384	525	54	325	439
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.2	3.2	4.4	4.4	3.0	4.4
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1599	1900	1578	1787	1850
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1599	1900	1578	1787	1900
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	95	404	553	57	342	462
RTOR Reduction (vph)	0	351	0	15	0	0
Lane Group Flow (vph)	95	53	553	42	342	462
Confl. Peds. (#/hr)				2		
Heavy Vehicles (%)	2%	1%	0%	0%	1%	0%
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Actuated Green, G (s)	9.1	9.1	27.9	27.9	22.4	53.3
Effective Green, g (s)	9.1	9.1	27.9	27.9	22.4	53.3
Actuated g/C Ratio	0.13	0.13	0.40	0.40	0.32	0.76
Clearance Time (s)	3.2	3.2	4.4	4.4	3.0	4.4
Vehicle Extension (s)	2.0	2.0	3.0	3.0	2.0	3.0
Lane Grp Cap (vph)	230	207	757	628	571	1408
v/s Ratio Prot	c0.05		c0.29		c0.19	0.25
v/s Ratio Perm		0.03		0.03		
v/c Ratio	0.41	0.25	0.73	0.07	0.60	0.33
Uniform Delay, d1	28.0	27.4	17.9	13.0	20.0	2.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	0.23
Incremental Delay, d2	0.4	0.2	6.1	0.2	1.0	0.5
Delay (s)	28.4	27.6	24.0	13.2	21.0	1.1
Level of Service	C	C	C	B	C	A
Approach Delay (s)	27.8		23.0			9.6
Approach LOS	C		C			A

Intersection Summary				
HCM 2000 Control Delay	18.6	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.63			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	10.6	
Intersection Capacity Utilization	61.0%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
39: Nave Dr & Main Gate Dr

02/15/2018

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	352	273	293	317	272	272
Future Volume (vph)	352	273	293	317	272	272
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	4.1	4.1	3.0	4.4
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1805	1615	1900	1615	1805	1881
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1805	1615	1900	1615	1805	1881
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	371	287	308	334	286	286
RTOR Reduction (vph)	0	203	0	247	0	0
Lane Group Flow (vph)	371	84	308	87	286	286
Heavy Vehicles (%)	0%	0%	0%	0%	0%	1%
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Actuated Green, G (s)	14.7	14.7	13.2	13.2	12.4	28.3
Effective Green, g (s)	14.7	14.7	13.2	13.2	12.4	28.3
Actuated g/C Ratio	0.29	0.29	0.26	0.26	0.25	0.56
Clearance Time (s)	3.0	3.0	4.1	4.1	3.0	4.4
Vehicle Extension (s)	2.0	2.0	1.0	1.0	1.0	1.0
Lane Grp Cap (vph)	526	471	497	422	444	1056
v/s Ratio Prot	c0.21		c0.16		c0.16	0.15
v/s Ratio Perm		0.05		0.05		
v/c Ratio	0.71	0.18	0.62	0.21	0.64	0.27
Uniform Delay, d1	15.9	13.3	16.4	14.5	17.0	5.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.5	0.1	1.6	0.1	2.4	0.1
Delay (s)	19.4	13.4	18.0	14.6	19.4	5.8
Level of Service	B	B	B	B	B	A
Approach Delay (s)	16.8		16.2			12.6
Approach LOS	B		B			B

Intersection Summary				
HCM 2000 Control Delay	15.3	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.66			
Actuated Cycle Length (s)	50.4	Sum of lost time (s)	10.1	
Intersection Capacity Utilization	60.1%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
40: Nave Dr & Bolling Dr

02/15/2018

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	219	62	560	345	98	571
Future Volume (vph)	219	62	560	345	98	571
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	4.1		3.0	3.5
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	0.97	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.95		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1787	1569	1791		1805	1881
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1787	1569	1791		1805	1881
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	228	65	583	359	102	595
RTOR Reduction (vph)	0	52	23	0	0	0
Lane Group Flow (vph)	228	13	919	0	102	595
Confl. Peds. (#/hr)		6				
Heavy Vehicles (%)	1%	0%	1%	0%	0%	1%
Turn Type	Prot	Perm	NA		Prot	NA
Protected Phases	4		6		5	2
Permitted Phases		4				
Actuated Green, G (s)	14.1	14.1	37.6		6.9	48.1
Effective Green, g (s)	14.1	14.1	37.6		6.9	48.1
Actuated g/C Ratio	0.21	0.21	0.55		0.10	0.70
Clearance Time (s)	3.0	3.0	4.1		3.0	3.5
Vehicle Extension (s)	2.0	2.0	2.0		2.0	2.0
Lane Grp Cap (vph)	366	322	980		181	1316
v/s Ratio Prot	c0.13		c0.51		c0.06	0.32
v/s Ratio Perm		0.01				
v/c Ratio	0.62	0.04	0.94		0.56	0.45
Uniform Delay, d1	24.9	21.9	14.5		29.5	4.5
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	2.4	0.0	15.5		2.4	0.1
Delay (s)	27.2	21.9	30.0		31.8	4.6
Level of Service	C	C	C		C	A
Approach Delay (s)	26.1		30.0			8.6
Approach LOS	C		C			A

Intersection Summary				
HCM 2000 Control Delay	21.7	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.82			
Actuated Cycle Length (s)	68.7	Sum of lost time (s)	10.1	
Intersection Capacity Utilization	81.7%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

Intersection	
Intersection Delay, s/veh	19.3
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	8	10	1	103	20	754	0	68	37	273	70	12
Future Vol, veh/h	8	10	1	103	20	754	0	68	37	273	70	12
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	10	1	106	21	777	0	70	38	281	72	12
Number of Lanes	0	1	0	0	1	1	0	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	2	1
HCM Control Delay	10.7	21	11.9	17.9
HCM LOS	B	C	B	C

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	0%	42%	23%	0%	100%	0%
Vol Thru, %	65%	53%	4%	0%	0%	85%
Vol Right, %	35%	5%	72%	100%	0%	15%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	105	19	447	430	273	82
LT Vol	0	8	103	0	273	0
Through Vol	68	10	20	0	0	70
RT Vol	37	1	324	430	0	12
Lane Flow Rate	108	20	461	443	281	85
Geometry Grp	6	6	7	7	7	7
Degree of Util (X)	0.209	0.04	0.739	0.672	0.58	0.16
Departure Headway (Hd)	6.957	7.339	5.773	5.462	7.416	6.804
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	515	486	627	660	487	527
Service Time	5.008	5.414	3.522	3.21	5.163	4.55
HCM Lane V/C Ratio	0.21	0.041	0.735	0.671	0.577	0.161
HCM Control Delay	11.9	10.7	23.2	18.7	20	10.9
HCM Lane LOS	B	B	C	C	C	B
HCM 95th-tile Q	0.8	0.1	6.4	5.2	3.6	0.6

HCM 2010 AWSC
1: Simmons Ln & San Marin Dr 02/15/2018

Intersection	
Intersection Delay, s/veh	64.6
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	16	596	129	201	489	9	113	12	333	29	13	15
Future Vol, veh/h	16	596	129	201	489	9	113	12	333	29	13	15
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	17	641	139	216	526	10	122	13	358	31	14	16
Number of Lanes	1	2	0	1	2	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	3	3
HCM Control Delay	95.9	41.3	55.1	18.1
HCM LOS	F	E	F	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1
Vol Left, %	90%	0%	100%	0%	0%	100%	0%	0%	51%
Vol Thru, %	10%	0%	0%	100%	61%	0%	100%	95%	23%
Vol Right, %	0%	100%	0%	0%	39%	0%	0%	5%	26%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	125	333	16	397	328	201	326	172	57
LT Vol	113	0	16	0	0	201	0	0	29
Through Vol	12	0	0	397	199	0	326	163	13
RT Vol	0	333	0	0	129	0	0	9	15
Lane Flow Rate	134	358	17	427	352	216	351	185	61
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.4	0.952	0.049	1.158	0.927	0.597	0.92	0.483	0.203
Departure Headway (Hd)	11.112	9.932	10.284	9.761	9.474	10.32	9.797	9.759	12.307
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	327	369	348	372	384	352	372	372	294
Service Time	8.812	7.632	8.047	7.524	7.236	8.02	7.497	7.459	10.007
HCM Lane V/C Ratio	0.41	0.97	0.049	1.148	0.917	0.614	0.944	0.497	0.207
HCM Control Delay	21	67.9	13.6	128	61	27.2	60.7	21.2	18.1
HCM Lane LOS	C	F	B	F	F	D	F	C	C
HCM 95th-tile Q	1.9	10.3	0.2	16.7	9.9	3.7	9.6	2.5	0.7

HCM Signalized Intersection Capacity Analysis
1: Simmons Ln & San Marin Dr 02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	596	129	201	489	9	113	12	333	29	13	15
Future Volume (vph)	16	596	129	201	489	9	113	12	333	29	13	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.98	
Satd. Flow (prot)	1787	1881	1599	1787	1881	1599		1800	1599		1770	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.77	1.00		0.82	
Satd. Flow (perm)	1787	1881	1599	1787	1881	1599		1456	1599		1494	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	17	641	139	216	526	10	122	13	358	31	14	16
RTOR Reduction (vph)	0	0	59	0	0	4	0	0	88	0	13	0
Lane Group Flow (vph)	17	641	80	216	526	6	0	135	270	0	48	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	pm+ov	Perm	NA	
Protected Phases	7	4		3	8			2	3		6	
Permitted Phases			4			8	2		2	6		
Actuated Green, G (s)	0.6	32.2	32.2	13.2	44.8	44.8		13.3	26.5		13.3	
Effective Green, g (s)	0.6	32.2	32.2	13.2	44.8	44.8		13.3	26.5		13.3	
Actuated g/C Ratio	0.01	0.46	0.46	0.19	0.63	0.63		0.19	0.37		0.19	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	
Lane Grp Cap (vph)	15	856	728	333	1191	1013		273	689		281	
v/s Ratio Prot	0.01	c0.34		c0.12	0.28				c0.07			
v/s Ratio Perm			0.05			0.00		c0.09	0.10		0.03	
v/c Ratio	1.13	0.75	0.11	0.65	0.44	0.01		0.49	0.39		0.17	
Uniform Delay, d1	35.1	15.9	11.0	26.6	6.6	4.8		25.7	16.2		24.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2	279.2	3.6	0.1	4.3	0.3	0.0		1.4	0.4		0.3	
Delay (s)	314.2	19.5	11.1	30.9	6.9	4.8		27.1	16.6		24.4	
Level of Service	F	B	B	C	A	A		C	B		C	
Approach Delay (s)		24.3			13.7			19.5			24.4	
Approach LOS		C			B			B			C	

Intersection Summary			
HCM 2000 Control Delay	19.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	70.7	Sum of lost time (s)	12.0
Intersection Capacity Utilization	65.3%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

MOVEMENT SUMMARY

Site: 1 [AM Cumulative]

Simmons Lane/San Marin Drive
AM Cumulative with Project

Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NB Simmons Ln											
3	L2	119	2.0	0.719	21.5	LOS C	7.3	186.0	0.87	1.17	27.3
8	T1	13	2.0	0.719	21.5	LOS C	7.3	186.0	0.87	1.17	27.3
18	R2	351	2.0	0.719	21.5	LOS C	7.3	186.0	0.87	1.17	26.7
Approach		482	2.0	0.719	21.5	LOS C	7.3	186.0	0.87	1.17	26.9
East: WB San Marin Drive											
1	L2	212	2.0	0.174	4.5	LOS A	0.8	19.4	0.29	0.17	32.6
6	T1	515	2.0	0.432	7.4	LOS A	2.5	64.7	0.40	0.25	33.6
16	R2	9	2.0	0.432	7.4	LOS A	2.5	64.7	0.40	0.25	32.7
Approach		736	2.0	0.432	6.5	LOS A	2.5	64.7	0.37	0.23	33.3
North: SB Simmons Ln											
7	L2	31	2.0	0.090	6.4	LOS A	0.3	7.8	0.57	0.57	32.8
4	T1	14	2.0	0.090	6.4	LOS A	0.3	7.8	0.57	0.57	32.8
14	R2	16	2.0	0.090	6.4	LOS A	0.3	7.8	0.57	0.57	32.0
Approach		60	2.0	0.090	6.4	LOS A	0.3	7.8	0.57	0.57	32.6
West: EB San Marin Drive											
5	L2	17	2.0	0.752	16.9	LOS B	14.9	377.3	0.85	1.00	29.5
2	T1	627	2.0	0.752	16.9	LOS B	14.9	377.3	0.85	1.00	29.5
12	R2	136	2.0	0.752	16.9	LOS B	14.9	377.3	0.85	1.00	28.8
Approach		780	2.0	0.752	16.9	LOS B	14.9	377.3	0.85	1.00	29.3
All Vehicles		2058	2.0	0.752	14.0	LOS B	14.9	377.3	0.67	0.75	30.1

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Organisation: W-TRANS | Processed: Tuesday, February 27, 2018 3:50:36 PM
Project: N:\AAA\MAX\NOV\126NOV\SIDRA\Simmons-San Marin.sip7

HCM Signalized Intersection Capacity Analysis
2: W Campus Dr & San Marin Dr

02/15/2018

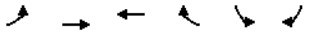
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	953	2	2	711	204	1	0	4	25	0	1
Future Volume (vph)	37	953	2	2	711	204	1	0	4	25	0	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.8		4.0	4.8	4.8		4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00		0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		0.89		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99		0.95	0.95	1.00
Satd. Flow (prot)	1805	3573		1805	3574	1615		1678		1715	1715	1615
Flt Permitted	0.95	1.00		0.95	1.00	1.00		1.00		1.00	1.00	1.00
Satd. Flow (perm)	1805	3573		1805	3574	1615		1695		1805	1805	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	40	1036	2	2	773	222	1	0	4	27	0	1
RTOR Reduction (vph)	0	0	0	0	0	102	0	5	0	0	0	1
Lane Group Flow (vph)	40	1038	0	2	773	120	0	0	0	13	14	0
Confl. Peds. (#/hr)			2									
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8			4		4
Actuated Green, G (s)	2.3	21.6		1.0	20.3	20.3		2.3		2.3	2.3	2.3
Effective Green, g (s)	2.3	21.6		1.0	20.3	20.3		2.3		2.3	2.3	2.3
Actuated g/C Ratio	0.06	0.57		0.03	0.54	0.54		0.06		0.06	0.06	0.06
Clearance Time (s)	4.0	4.8		4.0	4.8	4.8		4.0		4.0	4.0	4.0
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0		2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	110	2047		47	1924	869		103		110	110	98
v/s Ratio Prot	c0.02	c0.29		0.00	0.22							
v/s Ratio Perm						0.07		0.00		0.01	c0.01	0.00
v/c Ratio	0.36	0.51		0.04	0.40	0.14		0.00		0.12	0.13	0.00
Uniform Delay, d1	17.0	4.8		17.9	5.1	4.3		16.6		16.7	16.8	16.6
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	0.7	0.3		0.1	0.2	0.1		0.0		0.2	0.2	0.0
Delay (s)	17.7	5.1		18.0	5.3	4.4		16.6		16.9	16.9	16.6
Level of Service	B	A		B	A	A		B		B	B	B
Approach Delay (s)		5.6			5.1			16.6			16.9	
Approach LOS		A			A			B			B	

Intersection Summary			
HCM 2000 Control Delay	5.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	37.7	Sum of lost time (s)	12.8
Intersection Capacity Utilization	47.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: San Marin Dr & E Campus Drive

02/15/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	71	975	915	400	64	48
Future Volume (vph)	71	975	915	400	64	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.3	4.3	4.3	3.0	3.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1805	3574	3574	1615	3502	1594
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1805	3574	3574	1615	3502	1594
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	77	1060	995	435	70	52
RTOR Reduction (vph)	0	0	0	103	0	48
Lane Group Flow (vph)	77	1060	995	332	70	4
Confl. Peds. (#/hr)						1
Heavy Vehicles (%)	0%	1%	1%	0%	0%	0%
Turn Type	Prot	NA	NA	Perm	Perm	Perm
Protected Phases	5	2	6			
Permitted Phases				6	4	4
Actuated Green, G (s)	10.0	112.1	99.1	99.1	10.6	10.6
Effective Green, g (s)	10.0	112.1	99.1	99.1	10.6	10.6
Actuated g/C Ratio	0.08	0.86	0.76	0.76	0.08	0.08
Clearance Time (s)	3.0	4.3	4.3	4.3	3.0	3.0
Vehicle Extension (s)	2.0	4.0	4.0	4.0	2.0	2.0
Lane Grp Cap (vph)	138	3081	2724	1231	285	129
v/s Ratio Prot	c0.04	0.30	c0.28			
v/s Ratio Perm				0.21	c0.02	0.00
v/c Ratio	0.56	0.34	0.37	0.27	0.25	0.03
Uniform Delay, d1	57.9	1.8	5.1	4.6	56.0	55.0
Progression Factor	1.00	1.00	0.54	0.36	1.00	1.00
Incremental Delay, d2	2.8	0.3	0.1	0.1	0.2	0.0
Delay (s)	60.6	2.1	2.8	1.8	56.1	55.0
Level of Service	E	A	A	A	E	E
Approach Delay (s)		6.0	2.5		55.6	
Approach LOS		A	A		E	

Intersection Summary				
HCM 2000 Control Delay	6.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	10.3
Intersection Capacity Utilization	51.3%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
4: Redwood Blvd & San Marin Dr

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	71	800	171	378	1087	738	179	143	314	183	60	48
Future Volume (vph)	71	800	171	378	1087	738	179	143	314	183	60	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.6		3.0	4.0		4.3	4.3	4.3	4.3	4.3	
Lane Util. Factor	1.00	0.91		1.00	0.91		0.97	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	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	1.00	
Frt	1.00	0.97		1.00	0.94		1.00	1.00	0.85	1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1787	4986		1752	4824		3467	1881	1568	1787	1741	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1787	4986		1752	4824		3467	1881	1568	1787	1741	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	75	842	180	398	1144	777	188	151	331	193	63	51
RTOR Reduction (vph)	0	26	0	0	71	0	0	0	293	0	25	0
Lane Group Flow (vph)	75	996	0	398	1850	0	188	151	38	193	89	0
Confl. Peds. (#/hr)			4									5
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	1%	1%	1%	3%	1%	1%	1%	1%	3%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA		Split	NA	Perm	Split	NA	
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases					2				7			
Actuated Green, G (s)	8.3	44.8		35.1	71.2		14.8	14.8	14.8	20.1	20.1	
Effective Green, g (s)	8.3	44.8		35.1	71.2		14.8	14.8	14.8	20.1	20.1	
Actuated g/C Ratio	0.06	0.34		0.27	0.55		0.11	0.11	0.11	0.15	0.15	
Clearance Time (s)	3.0	3.6		3.0	4.0		4.3	4.3	4.3	4.3	4.3	
Vehicle Extension (s)	2.0	4.0		5.0	4.0		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	114	1718		473	2642		394	214	178	276	269	
v/s Ratio Prot	0.04	0.20		c0.23	c0.38		0.05	c0.08		c0.11	0.05	
v/s Ratio Perm									0.02			
v/c Ratio	0.66	0.58		0.84	0.70		0.48	0.71	0.21	0.70	0.33	
Uniform Delay, d1	59.5	34.9		44.8	21.6		54.0	55.5	52.3	52.1	48.9	
Progression Factor	1.17	0.95		1.03	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	9.6	1.4		8.2	0.9		0.3	8.3	0.2	6.1	0.3	
Delay (s)	79.0	34.4		54.3	22.4		54.3	63.8	52.5	58.2	49.2	
Level of Service	E	C		D	C		D	E	D	E	D	
Approach Delay (s)		37.5			27.8			55.6			54.9	
Approach LOS		D			C			E			D	

Intersection Summary				
HCM 2000 Control Delay	36.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	15.6
Intersection Capacity Utilization	92.3%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
4: Redwood Blvd & San Marin Dr 02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	71	800	171	378	1087	738	179	143	314	183	60	48
Future Volume (vph)	71	800	171	378	1087	738	179	143	314	183	60	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.6		3.0	4.0	4.3	4.3	4.3	3.0	4.3	4.3	
Lane Util. Factor	1.00	0.91		0.97	0.95	1.00	0.95	0.95	0.88	0.91	0.91	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	0.99	1.00	0.95	0.98	
Satd. Flow (prot)	1787	4986		3400	3574	1599	1698	1775	2760	1626	3210	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	0.99	1.00	0.95	0.98	
Satd. Flow (perm)	1787	4986		3400	3574	1599	1698	1775	2760	1626	3210	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	75	842	180	398	1144	777	188	151	331	193	63	51
RTOR Reduction (vph)	0	25	0	0	0	72	0	0	220	0	29	0
Lane Group Flow (vph)	75	997	0	398	1144	705	165	174	111	104	174	0
Confl. Peds. (#/hr)			4									5
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	1%	1%	1%	3%	1%	1%	1%	1%	3%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA	pm+ov	Split	NA	
Protected Phases	5	2		1	6	4	8	8	1	4	4	
Permitted Phases						6			8			
Actuated Green, G (s)	8.0	48.7		26.2	66.5	87.6	16.8	16.8	43.0	21.1	21.1	
Effective Green, g (s)	8.0	48.7		26.2	66.5	87.6	16.8	16.8	43.0	21.1	21.1	
Actuated g/C Ratio	0.06	0.38		0.20	0.52	0.68	0.13	0.13	0.34	0.16	0.16	
Clearance Time (s)	3.0	3.6		3.0	4.0	4.3	4.3	4.3	3.0	4.3	4.3	
Vehicle Extension (s)	2.0	4.0		5.0	4.0	2.0	2.0	2.0	5.0	2.0	2.0	
Lane Grp Cap (vph)	111	1897		695	1856	1094	222	232	927	268	529	
v/s Ratio Prot	c0.04	0.20		0.12	0.32	c0.11	0.10	c0.10	0.02	0.06	0.05	
v/s Ratio Perm						0.33			0.02			
v/c Ratio	0.68	0.53		0.57	0.62	0.64	0.74	0.75	0.12	0.39	0.33	
Uniform Delay, d1	58.7	30.7		45.9	21.7	11.4	53.5	53.6	29.4	47.7	47.2	
Progression Factor	1.00	1.00		0.99	0.76	1.19	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	12.0	1.0		1.2	1.0	0.6	11.1	11.4	0.1	0.3	0.1	
Delay (s)	70.8	31.8		46.8	17.5	14.2	64.7	65.0	29.5	48.0	47.3	
Level of Service	E	C		D	B	B	E	E	C	D	D	
Approach Delay (s)		34.4			21.5			47.4			47.6	
Approach LOS		C			C			D			D	

Intersection Summary				
HCM 2000 Control Delay	30.5	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.66			
Actuated Cycle Length (s)	128.0	Sum of lost time (s)	15.6	
Intersection Capacity Utilization	82.6%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
5: US 101 SB Ramps & San Marin Dr 02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	744	555	192	1452	0	0	0	0	101	1	750
Future Volume (vph)	0	744	555	192	1452	0	0	0	0	101	1	750
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9	4.9	3.0	5.3						4.0	4.0
Lane Util. Factor		0.95	1.00	1.00	0.95						1.00	0.88
Frpb, ped/bikes		1.00	0.99	1.00	1.00						1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		3574	1575	1805	3574						1810	2814
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		3574	1575	1805	3574						1810	2814
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)	0	791	590	204	1545	0	0	0	0	107	1	798
RTOR Reduction (vph)	0	0	335	0	0	0	0	0	0	0	0	66
Lane Group Flow (vph)	0	791	255	204	1545	0	0	0	0	0	108	732
Confl. Peds. (#/hr)			4									
Heavy Vehicles (%)	0%	1%	1%	0%	1%	0%	0%	0%	0%	0%	0%	1%
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			2									4
Actuated Green, G (s)		28.1	28.1	8.0	38.7						17.0	17.0
Effective Green, g (s)		28.1	28.1	8.0	38.7						17.0	17.0
Actuated g/C Ratio		0.43	0.43	0.12	0.60						0.26	0.26
Clearance Time (s)		4.9	4.9	3.0	5.3						4.0	4.0
Vehicle Extension (s)		4.0	4.0	2.0	4.0						2.0	2.0
Lane Grp Cap (vph)		1545	680	222	2127						473	735
v/s Ratio Prot		0.22		c0.11	c0.43						0.06	
v/s Ratio Perm			0.16									c0.26
v/c Ratio		0.51	0.38	0.92	0.73						0.23	1.00
Uniform Delay, d1		13.5	12.5	28.2	9.4						18.8	24.0
Progression Factor		0.43	2.82	1.00	1.00						1.00	1.00
Incremental Delay, d2		1.0	1.3	37.8	2.2						0.1	32.0
Delay (s)		6.8	36.5	66.0	11.6						18.9	56.0
Level of Service		A	D	E	B						B	E
Approach Delay (s)		19.5			17.9			0.0			51.6	
Approach LOS		B			B			A			D	

Intersection Summary				
HCM 2000 Control Delay	26.0	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.87			
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	11.9	
Intersection Capacity Utilization	113.7%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
5: US 101 SB Ramps & San Marin Dr 02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	744	555	192	1452	0	0	0	0	101	1	750
Future Volume (vph)	0	744	555	192	1452	0	0	0	0	101	1	750
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9	4.9	3.0	5.3						4.0	4.0
Lane Util. Factor		0.91	0.91	1.00	0.95						1.00	0.88
Frpb, ped/bikes		1.00	1.00	1.00	1.00						1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00						1.00	1.00
Frt		0.97	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		3324	1455	1805	3574						1810	2814
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		3324	1455	1805	3574						1810	2814
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)	0	791	590	204	1545	0	0	0	0	107	1	798
RTOR Reduction (vph)	0	11	228	0	0	0	0	0	0	0	0	63
Lane Group Flow (vph)	0	951	191	204	1545	0	0	0	0	0	108	735
Confl. Peds. (#/hr)			4									
Heavy Vehicles (%)	0%	1%	1%	0%	1%	0%	0%	0%	0%	0%	0%	1%
Turn Type		NA	Prot	Prot	NA					Split	NA	Perm
Protected Phases		2	2	1	6					4	4	
Permitted Phases												4
Actuated Green, G (s)		58.2	58.2	16.7	82.9						35.8	35.8
Effective Green, g (s)		58.2	58.2	16.7	82.9						35.8	35.8
Actuated g/C Ratio		0.45	0.45	0.13	0.65						0.28	0.28
Clearance Time (s)		4.9	4.9	3.0	5.3						4.0	4.0
Vehicle Extension (s)		4.0	4.0	2.0	4.0						2.0	2.0
Lane Grp Cap (vph)		1511	661	235	2314						506	787
v/s Ratio Prot		0.29	0.13	c0.11	c0.43						0.06	
v/s Ratio Perm												c0.26
v/c Ratio		0.63	0.29	0.87	0.67						0.21	0.93
Uniform Delay, d1		26.7	21.9	54.6	14.0						35.3	45.0
Progression Factor		0.59	0.39	1.00	0.69						1.00	1.00
Incremental Delay, d2		1.9	1.0	21.6	1.2						0.1	17.8
Delay (s)		17.7	9.6	75.9	10.8						35.4	62.7
Level of Service		B	A	E	B						D	E
Approach Delay (s)		15.2			18.4			0.0			59.5	
Approach LOS		B			B			A			E	

Intersection Summary				
HCM 2000 Control Delay	26.5	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.81			
Actuated Cycle Length (s)	128.0	Sum of lost time (s)	14.9	
Intersection Capacity Utilization	100.7%	ICU Level of Service	G	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
6: US 101 NB Ramps & San Marin Dr 02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	411	432	0	0	763	96	875	0	181	0	0	0
Future Volume (vph)	411	432	0	0	763	96	875	0	181	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.6			4.9	4.9	3.5	3.5				
Lane Util. Factor	0.97	1.00			0.95	1.00	0.95	0.95				
Frpb, ped/bikes	1.00	1.00			1.00	0.99	1.00	0.99				
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00				
Frt	1.00	1.00			1.00	0.85	1.00	0.95				
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.97				
Satd. Flow (prot)	3467	1881			3574	1594	1681	1606				
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.97				
Satd. Flow (perm)	3467	1881			3574	1594	1681	1606				
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	433	455	0	0	803	101	921	0	191	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	73	0	57	0	0	0	0
Lane Group Flow (vph)	433	455	0	0	803	28	571	484	0	0	0	0
Confl. Peds. (#/hr)			3			1			1	1		
Heavy Vehicles (%)	1%	1%	0%	0%	1%	0%	2%	0%	3%	0%	0%	0%
Turn Type	Prot	NA			NA	Perm	Split	NA				
Protected Phases	5	2			6		8	8				
Permitted Phases						6						
Actuated Green, G (s)	9.4	30.5			17.3	17.3	23.5	23.5				
Effective Green, g (s)	9.4	30.5			17.3	17.3	23.5	23.5				
Actuated g/C Ratio	0.15	0.49			0.28	0.28	0.38	0.38				
Clearance Time (s)	3.5	4.6			4.9	4.9	3.5	3.5				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	2.5	2.5				
Lane Grp Cap (vph)	524	923			995	444	636	607				
v/s Ratio Prot	c0.12	0.24			c0.22		c0.34	0.30				
v/s Ratio Perm						0.02						
v/c Ratio	0.83	0.49			0.81	0.06	0.90	0.80				
Uniform Delay, d1	25.6	10.6			20.8	16.5	18.2	17.2				
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00				
Incremental Delay, d2	9.8	0.6			5.1	0.1	15.3	7.0				
Delay (s)	35.4	11.2			26.0	16.5	33.5	24.2				
Level of Service	D	B			C	B	C	C				
Approach Delay (s)		23.0			24.9			29.0			0.0	
Approach LOS		C			C			C			A	

Intersection Summary				
HCM 2000 Control Delay	25.9	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.85			
Actuated Cycle Length (s)	62.1	Sum of lost time (s)	11.9	
Intersection Capacity Utilization	113.7%	ICU Level of Service	H	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
6: US 101 NB Ramps & San Marin Dr

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	411	432	0	0	763	96	875	0	181	0	0	0
Future Volume (vph)	411	432	0	0	763	96	875	0	181	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.6			4.9	4.9	3.5	3.5				
Lane Util. Factor	0.97	1.00			0.95	1.00	0.97	1.00				
Frpb, ped/bikes	1.00	1.00			1.00	0.99	1.00	0.98				
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00				
Frt	1.00	1.00			1.00	0.85	1.00	0.85				
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00				
Satd. Flow (prot)	3467	1881			3574	1594	3433	1535				
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00				
Satd. Flow (perm)	3467	1881			3574	1594	3433	1535				
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	433	455	0	0	803	101	921	0	191	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	50	0	102	0	0	0	0
Lane Group Flow (vph)	433	455	0	0	803	51	921	89	0	0	0	0
Confl. Peds. (#/hr)			3			1			1	1		
Heavy Vehicles (%)	1%	1%	0%	0%	1%	0%	2%	0%	3%	0%	0%	0%
Turn Type	Prot	NA			NA	Perm	Split	NA				
Protected Phases	5	2			6		8	8				
Permitted Phases						6						
Actuated Green, G (s)	20.3	60.0			35.9	35.9	59.9	59.9				
Effective Green, g (s)	20.3	60.0			35.9	35.9	59.9	59.9				
Actuated g/C Ratio	0.16	0.47			0.28	0.28	0.47	0.47				
Clearance Time (s)	3.5	4.6			4.9	4.9	3.5	3.5				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	2.5	2.5				
Lane Grp Cap (vph)	549	881			1002	447	1606	718				
v/s Ratio Prot	c0.12	0.24			c0.22		c0.27	0.06				
v/s Ratio Perm						0.03						
v/c Ratio	0.79	0.52			0.80	0.11	0.57	0.12				
Uniform Delay, d1	51.8	23.8			42.7	34.2	24.8	19.2				
Progression Factor	0.73	0.38			1.00	1.00	1.00	1.00				
Incremental Delay, d2	5.8	0.6			4.9	0.2	1.5	0.4				
Delay (s)	43.6	9.7			47.7	34.4	26.3	19.6				
Level of Service	D	A			D	C	C	B				
Approach Delay (s)		26.2			46.2			25.1			0.0	
Approach LOS		C			D			C			A	

Intersection Summary				
HCM 2000 Control Delay	32.0	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.68			
Actuated Cycle Length (s)	128.0	Sum of lost time (s)	11.9	
Intersection Capacity Utilization	100.7%	ICU Level of Service	G	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
7: Redwood Blvd & Olive St

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	111	98	36	148	130	116	18	452	140	151	409	87
Future Volume (vph)	111	98	36	148	130	116	18	452	140	151	409	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.1	5.1			5.1		4.0	3.9	3.9	4.0	3.9	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.96			0.96		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00			0.98		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1788			1756		1770	3539	1583	1770	3446	
Flt Permitted	0.95	1.00			0.98		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1788			1756		1770	3539	1583	1770	3446	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	121	107	39	161	141	126	20	491	152	164	445	95
RTOR Reduction (vph)	0	14	0	0	13	0	0	0	102	0	16	0
Lane Group Flow (vph)	121	132	0	0	415	0	20	491	50	164	524	0
Turn Type	Split	NA		Split	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	11.8	11.8			25.4		3.5	18.1	18.1	11.7	26.3	
Effective Green, g (s)	11.8	11.8			25.4		3.5	18.1	18.1	11.7	26.3	
Actuated g/C Ratio	0.14	0.14			0.30		0.04	0.21	0.21	0.14	0.31	
Clearance Time (s)	5.1	5.1			5.1		4.0	3.9	3.9	4.0	3.9	
Vehicle Extension (s)	1.0	1.0			1.0		1.0	1.0	1.0	1.0	1.0	
Lane Grp Cap (vph)	245	247			524		72	752	336	243	1064	
v/s Ratio Prot	0.07	c0.07			c0.24		0.01	c0.14		c0.09	0.15	
v/s Ratio Perm									0.03			
v/c Ratio	0.49	0.54			0.79		0.28	0.65	0.15	0.67	0.49	
Uniform Delay, d1	33.9	34.1			27.4		39.6	30.6	27.2	34.9	24.0	
Progression Factor	1.00	1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.6	1.1			7.5		0.8	1.6	0.1	5.7	0.1	
Delay (s)	34.5	35.2			35.0		40.3	32.2	27.3	40.6	24.1	
Level of Service	C	D			C		D	C	C	D	C	
Approach Delay (s)		34.9			35.0			31.3			27.9	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM 2000 Control Delay	31.4	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.69			
Actuated Cycle Length (s)	85.1	Sum of lost time (s)	18.1	
Intersection Capacity Utilization	67.0%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
8: Redwood Blvd & Grant Ave

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	99	205	25	76	45	225	391	48	35	444	87
Future Volume (vph)	100	99	205	25	76	45	225	391	48	35	444	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5		3.5	3.7	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	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		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1763	1900	1564	1803	1900	1588	1805	3474		1805	3440	
Flt Permitted	0.70	1.00	1.00	0.69	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1304	1900	1564	1305	1900	1588	1805	3474		1805	3440	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	109	108	223	27	83	49	245	425	52	38	483	95
RTOR Reduction (vph)	0	0	162	0	0	36	0	8	0	0	16	0
Lane Group Flow (vph)	109	108	61	27	83	13	245	469	0	38	562	0
Confl. Peds. (#/hr)	9		11	2		1			10			9
Confl. Bikes (#/hr)			5			5			5			5
Heavy Vehicles (%)	2%	0%	1%	0%	0%	0%	0%	2%	0%	0%	2%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8		8	4		4						
Actuated Green, G (s)	17.7	17.7	17.7	17.7	17.7	17.7	15.6	28.9		6.7	19.8	
Effective Green, g (s)	17.7	17.7	17.7	17.7	17.7	17.7	15.6	28.9		6.7	19.8	
Actuated g/C Ratio	0.28	0.28	0.28	0.28	0.28	0.28	0.24	0.45		0.10	0.31	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5		3.5	3.7	
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0	4.0	2.5	3.0		2.5	3.0	
Lane Grp Cap (vph)	358	523	430	359	523	437	437	1561		188	1059	
v/s Ratio Prot		0.06			0.04		c0.14	0.13		0.02	c0.16	
v/s Ratio Perm	c0.08		0.04	0.02		0.01						
v/c Ratio	0.30	0.21	0.14	0.08	0.16	0.03	0.56	0.30		0.20	0.53	
Uniform Delay, d1	18.4	17.9	17.6	17.2	17.7	17.0	21.3	11.3		26.4	18.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	0.3	0.2	0.1	0.2	0.0	1.3	0.1		0.4	0.5	
Delay (s)	19.1	18.2	17.8	17.4	17.9	17.1	22.7	11.4		26.7	18.9	
Level of Service	B	B	B	B	B	B	C	B		C	B	
Approach Delay (s)		18.2			17.5			15.2			19.4	
Approach LOS		B			B			B			B	

Intersection Summary				
HCM 2000 Control Delay	17.4	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.46			
Actuated Cycle Length (s)	64.3	Sum of lost time (s)	11.2	
Intersection Capacity Utilization	56.0%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM 2010 AWSC
9: San Marin Dr/Sutro Ave & Novato Blvd

02/15/2018

Intersection	
Intersection Delay, s/veh	39.9
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	108	199	63	21	181	177	116	161	51	197	98	102
Future Vol, veh/h	108	199	63	21	181	177	116	161	51	197	98	102
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	117	216	68	23	197	192	126	175	55	214	107	111
Number of Lanes	1	1	0	1	1	0	1	1	0	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	3	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	3	2	2
HCM Control Delay	31.7	79.2	25.1	22.3
HCM LOS	D	F	D	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%	0%
Vol Thru, %	0%	76%	0%	76%	0%	51%	0%	100%	0%
Vol Right, %	0%	24%	0%	24%	0%	49%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	116	212	108	262	21	358	197	98	102
LT Vol	116	0	108	0	21	0	197	0	0
Through Vol	0	161	0	199	0	181	0	98	0
RT Vol	0	51	0	63	0	177	0	0	102
Lane Flow Rate	126	230	117	285	23	389	214	107	111
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.365	0.624	0.335	0.756	0.066	1.022	0.612	0.29	0.279
Departure Headway (Hd)	10.76	10.056	10.475	9.779	10.336	9.458	10.542	10.019	9.286
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	337	362	345	373	351	389	345	361	389
Service Time	8.46	7.756	8.175	7.479	7.969	7.092	8.242	7.719	6.986
HCM Lane V/C Ratio	0.374	0.635	0.339	0.764	0.066	1	0.62	0.296	0.285
HCM Control Delay	19.5	28.1	18.4	37.2	13.7	83	28.5	16.8	15.5
HCM Lane LOS	C	D	C	E	B	F	D	C	C
HCM 95th-tile Q	1.6	4	1.4	6	0.2	12.7	3.8	1.2	1.1

HCM Signalized Intersection Capacity Analysis
9: San Marin Dr/Sutro Ave & Novato Blvd #1 02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	108	199	63	21	181	177	116	161	51	197	98	102
Future Volume (vph)	108	199	63	21	181	177	116	161	51	197	98	102
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.93		1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1796		1770	1725		1770	1796		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	1796		1770	1725		1770	1796		1770	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	117	216	68	23	197	192	126	175	55	214	107	111
RTOR Reduction (vph)	0	12	0	0	38	0	0	13	0	0	0	77
Lane Group Flow (vph)	117	272	0	23	351	0	126	217	0	214	107	34
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	7.0	26.0		1.6	20.6		7.8	15.7		13.5	21.4	21.4
Effective Green, g (s)	7.0	26.0		1.6	20.6		7.8	15.7		13.5	21.4	21.4
Actuated g/C Ratio	0.10	0.37		0.02	0.29		0.11	0.22		0.19	0.30	0.30
Clearance Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	175	659		40	501		195	398		337	563	478
v/s Ratio Prot	c0.07	0.15		0.01	c0.20		0.07	c0.12		c0.12	0.06	
v/s Ratio Perm												0.02
v/c Ratio	0.67	0.41		0.57	0.70		0.65	0.54		0.64	0.19	0.07
Uniform Delay, d1	30.8	16.7		34.3	22.3		30.2	24.4		26.4	18.3	17.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	9.3	0.4		18.4	4.4		7.2	1.5		3.9	0.2	0.1
Delay (s)	40.1	17.1		52.7	26.7		37.3	25.9		30.3	18.4	17.7
Level of Service	D	B		D	C		D	C		C	B	B
Approach Delay (s)		23.8			28.2			30.0			24.1	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	26.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	70.8	Sum of lost time (s)	14.0
Intersection Capacity Utilization	62.2%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

MOVEMENT SUMMARY

Site: 9 [AM Cumulative]

Novato Boulevard/San Marin Dr-Sutro Ave
AM Cumulative with Project

Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NB Sutro Ave											
3	L2	126	2.0	0.466	11.1	LOS B	3.0	75.3	0.71	0.79	31.2
8	T1	175	2.0	0.466	11.1	LOS B	3.0	75.3	0.71	0.79	31.2
18	R2	55	2.0	0.466	11.1	LOS B	3.0	75.3	0.71	0.79	30.4
Approach		357	2.0	0.466	11.1	LOS B	3.0	75.3	0.71	0.79	31.0
East: WB Novato Blvd											
1	L2	23	2.0	0.471	10.1	LOS B	3.1	79.3	0.66	0.68	32.3
6	T1	197	2.0	0.471	10.1	LOS B	3.1	79.3	0.66	0.68	32.3
16	R2	192	2.0	0.471	10.1	LOS B	3.1	79.3	0.66	0.68	31.4
Approach		412	2.0	0.471	10.1	LOS B	3.1	79.3	0.66	0.68	31.9
North: SB San Marin Drive											
7	L2	214	2.0	0.317	6.8	LOS A	1.5	37.8	0.51	0.42	32.3
4	T1	107	2.0	0.317	6.8	LOS A	1.5	37.8	0.51	0.42	32.3
14	R2	111	2.0	0.110	4.6	LOS A	0.4	11.0	0.42	0.32	34.0
Approach		432	2.0	0.317	6.2	LOS A	1.5	37.8	0.49	0.40	32.7
West: EB Novato Blvd											
5	L2	117	2.0	0.425	8.7	LOS A	2.3	59.4	0.60	0.52	32.4
2	T1	216	2.0	0.425	8.7	LOS A	2.3	59.4	0.60	0.52	32.3
12	R2	68	2.0	0.425	8.7	LOS A	2.3	59.4	0.60	0.52	31.5
Approach		402	2.0	0.425	8.7	LOS A	2.3	59.4	0.60	0.52	32.2
All Vehicles		1602	2.0	0.471	8.9	LOS A	3.1	79.3	0.61	0.59	32.0

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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HCM Signalized Intersection Capacity Analysis
10: Wilson Ave & Novato Blvd

02/15/2018

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	735	17	270	480	30	466
Future Volume (vph)	735	17	270	480	30	466
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.9		3.0	3.6	3.6	3.6
Lane Util. Factor	0.95		1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3561		1787	3610	1805	1593
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3561		1787	3610	1805	1593
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	865	20	318	565	35	548
RTOR Reduction (vph)	1	0	0	0	0	348
Lane Group Flow (vph)	884	0	318	565	35	200
Confl. Peds. (#/hr)		3			6	2
Heavy Vehicles (%)	1%	0%	1%	0%	0%	0%
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases						4
Actuated Green, G (s)	45.8		18.0	46.1	15.7	15.7
Effective Green, g (s)	45.8		18.0	46.1	15.7	15.7
Actuated g/C Ratio	0.51		0.20	0.51	0.17	0.17
Clearance Time (s)	3.9		3.0	3.6	3.6	3.6
Vehicle Extension (s)	3.0		2.0	3.0	2.0	2.0
Lane Grp Cap (vph)	1812		357	1849	314	277
v/s Ratio Prot	c0.25		c0.18	0.16	0.02	
v/s Ratio Perm						c0.13
v/c Ratio	0.49		0.89	0.31	0.11	0.72
Uniform Delay, d1	14.4		35.0	12.7	31.3	35.1
Progression Factor	1.00		1.03	0.49	1.00	1.00
Incremental Delay, d2	0.9		21.4	0.4	0.1	7.7
Delay (s)	15.4		57.4	6.6	31.3	42.8
Level of Service	B		E	A	C	D
Approach Delay (s)	15.4			24.9	42.1	
Approach LOS	B			C	D	

Intersection Summary				
HCM 2000 Control Delay	25.6	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.62			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.5	
Intersection Capacity Utilization	56.6%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
11: Novato Blvd & Simmons Ln

02/15/2018

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	291	890	493	96	87	277
Future Volume (vph)	291	890	493	96	87	277
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.9	3.6		3.0	3.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	3574	3510		1805	1599
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1805	3574	3510		1805	1599
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	342	1047	580	113	102	326
RTOR Reduction (vph)	0	0	14	0	0	267
Lane Group Flow (vph)	342	1047	679	0	102	59
Confl. Peds. (#/hr)					2	
Confl. Bikes (#/hr)				1		
Heavy Vehicles (%)	0%	1%	0%	0%	0%	1%
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	5	2	6		8	
Permitted Phases						8
Actuated Green, G (s)	18.0	45.8	46.1		16.3	16.3
Effective Green, g (s)	18.0	45.8	46.1		16.3	16.3
Actuated g/C Ratio	0.20	0.51	0.51		0.18	0.18
Clearance Time (s)	3.0	3.9	3.6		3.0	3.0
Vehicle Extension (s)	2.0	3.0	3.0		2.0	2.0
Lane Grp Cap (vph)	361	1818	1797		326	289
v/s Ratio Prot	c0.19	c0.29	0.19		c0.06	
v/s Ratio Perm						0.04
v/c Ratio	0.95	0.58	0.38		0.31	0.20
Uniform Delay, d1	35.5	15.4	13.3		32.0	31.3
Progression Factor	1.05	0.49	1.00		1.00	1.00
Incremental Delay, d2	31.9	1.1	0.6		0.2	0.1
Delay (s)	69.3	8.6	13.9		32.2	31.5
Level of Service	E	A	B		C	C
Approach Delay (s)		23.6	13.9		31.6	
Approach LOS		C	B		C	

Intersection Summary				
HCM 2000 Control Delay	22.3	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.61			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.5	
Intersection Capacity Utilization	47.8%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
12: Novato Blvd & Grant Ave

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	200	887	3	4	439	60	1	0	2	37	1	186
Future Volume (vph)	200	887	3	4	439	60	1	0	2	37	1	186
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.5	4.5	3.5	4.9	4.9		4.0		3.5	3.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00		1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.96		0.97		1.00	0.98	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00		1.00		0.98	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.91		1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.98		0.95	1.00	
Satd. Flow (prot)	1787	1863	1576	1805	3539	1534		1644		1748	1569	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.70		0.76	1.00	
Satd. Flow (perm)	1787	1863	1576	1805	3539	1534		1168		1390	1569	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	235	1044	4	5	516	71	1	0	2	44	1	219
RTOR Reduction (vph)	0	0	1	0	0	28	0	3	0	0	194	0
Lane Group Flow (vph)	235	1044	3	5	516	43	0	0	0	44	26	0
Confl. Peds. (#/hr)			1			8	5		12	12		5
Confl. Bikes (#/hr)			4			2			2			1
Heavy Vehicles (%)	1%	2%	0%	0%	2%	1%	0%	0%	0%	1%	0%	1%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8			4		
Actuated Green, G (s)	16.7	75.9	75.9	1.2	60.0	60.0		10.9		11.4	11.4	
Effective Green, g (s)	16.7	75.9	75.9	1.2	60.0	60.0		10.9		11.4	11.4	
Actuated g/C Ratio	0.17	0.76	0.76	0.01	0.60	0.60		0.11		0.11	0.11	
Clearance Time (s)	3.5	4.5	4.5	3.5	4.9	4.9		4.0		3.5	3.5	
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0	3.0		2.0		2.0	2.0	
Lane Grp Cap (vph)	298	1414	1196	21	2123	920		127		158	178	
v/s Ratio Prot	c0.13	c0.56		0.00	0.15						0.02	
v/s Ratio Perm			0.00			0.03		0.00		c0.03		
v/c Ratio	0.79	0.74	0.00	0.24	0.24	0.05		0.00		0.28	0.15	
Uniform Delay, d1	40.0	6.6	2.9	48.9	9.4	8.2		39.7		40.5	39.9	
Progression Factor	1.00	1.00	1.00	0.87	1.01	1.52		1.00		1.00	1.00	
Incremental Delay, d2	12.0	2.1	0.0	2.0	0.3	0.1		0.0		0.4	0.1	
Delay (s)	52.0	8.7	2.9	44.8	9.7	12.6		39.7		40.9	40.1	
Level of Service	D	A	A	D	A	B		D		D	D	
Approach Delay (s)		16.6			10.3			39.7			40.2	
Approach LOS		B			B			D			D	

Intersection Summary				
HCM 2000 Control Delay	17.8	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.4	
Intersection Capacity Utilization	75.8%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
13: Tamalpais Ave/7th St & Novato Blvd

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	96	795	37	62	462	122	39	102	38	72	109	46
Future Volume (vph)	96	795	37	62	462	122	39	102	38	72	109	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.0		3.5	5.0	5.0	3.5	3.5		3.5	3.5	3.5
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.95	1.00	0.99		1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.99	1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1787	1847		1787	1863	1523	1770	1794		1784	1881	1531
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.56	1.00		0.46	1.00	1.00
Satd. Flow (perm)	1787	1847		1787	1863	1523	1049	1794		862	1881	1531
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)	102	846	39	66	491	130	41	109	40	77	116	49
RTOR Reduction (vph)	0	1	0	0	0	19	0	15	0	0	0	42
Lane Group Flow (vph)	102	884	0	66	491	111	41	134	0	77	116	7
Confl. Peds. (#/hr)			11			17	6		1	1		6
Confl. Bikes (#/hr)			9			1			1			4
Heavy Vehicles (%)	1%	2%	1%	1%	2%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8			4		4
Actuated Green, G (s)	9.2	66.3		7.8	64.9	64.9	13.9	13.9		13.9	13.9	13.9
Effective Green, g (s)	9.2	66.3		7.8	64.9	64.9	13.9	13.9		13.9	13.9	13.9
Actuated g/C Ratio	0.09	0.66		0.08	0.65	0.65	0.14	0.14		0.14	0.14	0.14
Clearance Time (s)	3.5	5.0		3.5	5.0	5.0	3.5	3.5		3.5	3.5	3.5
Vehicle Extension (s)	2.0	5.0		2.0	5.0	5.0	2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	164	1224		139	1209	988	145	249		119	261	212
v/s Ratio Prot	c0.06	c0.48		0.04	0.26			0.07			0.06	
v/s Ratio Perm						0.07	0.04			c0.09		0.00
v/c Ratio	0.62	0.72		0.47	0.41	0.11	0.28	0.54		0.65	0.44	0.03
Uniform Delay, d1	43.7	10.9		44.1	8.4	6.6	38.6	40.1		40.7	39.5	37.2
Progression Factor	0.87	1.05		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.7	2.7		0.9	1.0	0.2	0.4	1.1		8.7	0.4	0.0
Delay (s)	41.8	14.1		45.1	9.4	6.9	39.0	41.2		49.5	39.9	37.3
Level of Service	D	B		D	A	A	D	D		D	D	D
Approach Delay (s)		17.0			12.3			40.7			42.4	
Approach LOS		B			B			D			D	

Intersection Summary				
HCM 2000 Control Delay	20.5	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.71			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	82.5%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
14: Novato Blvd & Diablo Ave

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	244	37	200	245	325	36	308	212	482	423	28
Future Volume (vph)	22	244	37	200	245	325	36	308	212	482	423	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	11	11	12	11	11	12	12	12	12
Total Lost time (s)		3.7		4.1	4.1	4.1	4.4	4.4	4.4	4.1	4.1	
Lane Util. Factor		0.95		0.91	0.91	1.00	1.00	1.00	1.00	0.91	0.91	
Frpb, ped/bikes		1.00		1.00	1.00	0.95	1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes		1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected		1.00		0.95	0.99	1.00	0.95	1.00	1.00	0.95	0.99	
Satd. Flow (prot)		3487		1557	3273	1510	1728	1801	1556	1610	3319	
Flt Permitted		1.00		0.95	0.99	1.00	0.95	1.00	1.00	0.95	0.99	
Satd. Flow (perm)		3487		1557	3273	1510	1728	1801	1556	1610	3319	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	22	249	38	204	250	332	37	314	216	492	432	29
RTOR Reduction (vph)	0	8	0	0	0	217	0	0	166	0	2	0
Lane Group Flow (vph)	0	301	0	147	307	115	37	314	50	310	641	0
Confl. Peds. (#/hr)			7			15			2			4
Confl. Bikes (#/hr)			1			1			3			5
Heavy Vehicles (%)	1%	1%	1%	2%	1%	2%	1%	2%	2%	2%	2%	1%
Turn Type	Split	NA		Split	NA	Perm	Split	NA	Perm	Split	NA	
Protected Phases	3	3		4	4		1	1		2	2	
Permitted Phases						4			1		2	
Actuated Green, G (s)		14.6		15.3	15.3	15.3	21.1	21.1	21.1	24.5	24.5	
Effective Green, g (s)		14.6		15.3	15.3	15.3	21.1	21.1	21.1	24.5	24.5	
Actuated g/C Ratio		0.16		0.17	0.17	0.17	0.23	0.23	0.23	0.27	0.27	
Clearance Time (s)		3.7		4.1	4.1	4.1	4.4	4.4	4.4	4.1	4.1	
Vehicle Extension (s)		2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)		554		259	545	251	397	413	357	429	885	
v/s Ratio Prot		c0.09		c0.09	0.09		0.02	c0.17		0.19	c0.19	
v/s Ratio Perm						0.08			0.03			
v/c Ratio		0.54		0.57	0.56	0.46	0.09	0.76	0.14	0.72	0.72	
Uniform Delay, d1		35.5		35.2	35.2	34.5	27.8	33.0	28.1	30.6	30.6	
Progression Factor		1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.6		1.7	0.8	0.5	0.0	7.3	0.1	5.0	2.5	
Delay (s)		36.1		36.9	36.0	35.0	27.9	40.2	28.2	35.6	33.1	
Level of Service		D		D	D	D	C	D	C	D	C	
Approach Delay (s)		36.1			35.7			34.8			33.9	
Approach LOS		D			D			C			C	

Intersection Summary				
HCM 2000 Control Delay	34.9	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.67			
Actuated Cycle Length (s)	91.8	Sum of lost time (s)	16.3	
Intersection Capacity Utilization	73.8%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
14: Diablo Ave & Novato Blvd

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	244	37	200	245	325	36	308	212	482	423	28
Future Volume (vph)	22	244	37	200	245	325	36	308	212	482	423	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	12	11	11	12	10	12	12
Total Lost time (s)	4.0	4.1	4.1	4.0	4.0	4.0	4.0	4.1		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		0.97	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	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		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1728	1818	1518	1711	1818	1558	1728	3190		3204	1843	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1728	1818	1518	1711	1818	1558	1728	3190		3204	1843	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	22	249	38	204	250	332	37	314	216	492	432	29
RTOR Reduction (vph)	0	0	29	0	0	135	0	124	0	0	2	0
Lane Group Flow (vph)	22	249	9	204	250	197	37	406	0	492	459	0
Confl. Peds. (#/hr)			7			15			2			4
Confl. Bikes (#/hr)			1			1			3			5
Heavy Vehicles (%)	1%	1%	1%	2%	1%	2%	1%	2%	2%	2%	2%	1%
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	1.7	19.5	19.5	13.5	31.4	48.0	3.3	18.3		16.6	31.7	
Effective Green, g (s)	1.7	19.5	19.5	13.5	31.4	48.0	3.3	18.3		16.6	31.7	
Actuated g/C Ratio	0.02	0.23	0.23	0.16	0.37	0.57	0.04	0.22		0.20	0.38	
Clearance Time (s)	4.0	4.1	4.1	4.0	4.0	4.0	4.0	4.1		4.0	4.0	
Vehicle Extension (s)	3.0	2.0	2.0	3.0	3.0	3.0	3.0	2.0		3.0	3.0	
Lane Grp Cap (vph)	34	421	351	274	678	963	67	694		632	694	
v/s Ratio Prot	0.01	c0.14		c0.12	0.14	0.04	0.02	0.13		c0.15	c0.25	
v/s Ratio Perm			0.01			0.09						
v/c Ratio	0.65	0.59	0.03	0.74	0.37	0.20	0.55	0.59		0.78	0.66	
Uniform Delay, d1	40.9	28.8	25.0	33.7	19.1	8.8	39.7	29.5		32.0	21.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	35.3	1.5	0.0	10.5	0.3	0.1	9.5	0.8		6.0	2.4	
Delay (s)	76.2	30.2	25.0	44.1	19.5	8.9	49.2	30.3		38.0	24.1	
Level of Service	E	C	C	D	B	A	D	C		D	C	
Approach Delay (s)		32.9			21.4			31.5			31.3	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM 2000 Control Delay	28.6	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.71			
Actuated Cycle Length (s)	84.1	Sum of lost time (s)	16.2	
Intersection Capacity Utilization	70.4%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
15: Redwood Blvd & Diablo Ave/De Long Ave

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	234	497	168	156	575	216	54	143	31	222	276	171
Future Volume (vph)	234	497	168	156	575	216	54	143	31	222	276	171
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	9
Total Lost time (s)	5.0	4.0		5.0	4.1		4.0	4.8	4.8	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95	1.00	0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3467	3456		1805	3349		1805	3610	1505	3303	1900	1408
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3467	3456		1805	3349		1805	3610	1505	3303	1900	1408
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	254	540	183	170	625	235	59	155	34	241	300	186
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	15	0	0	58
Lane Group Flow (vph)	254	723	0	170	860	0	59	155	19	241	300	128
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			5			5			5			5
Heavy Vehicles (%)	1%	0%	0%	0%	2%	5%	0%	0%	5%	6%	0%	1%
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)	17.0	48.2		17.0	48.1		10.4	36.0	36.0	11.0	37.4	37.4
Effective Green, g (s)	17.0	48.2		17.0	48.1		10.4	36.0	36.0	11.0	37.4	37.4
Actuated g/C Ratio	0.13	0.37		0.13	0.37		0.08	0.28	0.28	0.08	0.29	0.29
Clearance Time (s)	5.0	4.0		5.0	4.1		4.0	4.8	4.8	4.0	4.0	4.0
Vehicle Extension (s)	2.5	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	453	1281		236	1239		144	999	416	279	546	405
v/s Ratio Prot	0.07	0.21		c0.09	c0.26		0.03	0.04		c0.07	c0.16	
v/s Ratio Perm									0.01			0.09
v/c Ratio	0.56	0.56		0.72	0.69		0.41	0.16	0.05	0.86	0.55	0.32
Uniform Delay, d1	53.0	32.5		54.2	34.7		56.9	35.5	34.4	58.8	39.2	36.3
Progression Factor	1.00	1.00		1.12	0.89		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.3	1.8		7.6	2.8		0.7	0.3	0.2	22.4	3.9	2.0
Delay (s)	54.3	34.4		68.3	33.6		57.6	35.8	34.6	81.2	43.1	38.3
Level of Service	D	C		E	C		E	D	C	F	D	D
Approach Delay (s)		39.5			39.3			40.8			54.5	
Approach LOS		D			D			D			D	

Intersection Summary				
HCM 2000 Control Delay	43.2	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.67			
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	17.9	
Intersection Capacity Utilization	103.4%	ICU Level of Service	G	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
16: Reichert Ave & De Long Ave

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	71	690	14	66	954	208	13	22	40	192	37	78
Future Volume (vph)	71	690	14	66	954	208	13	22	40	192	37	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.1		3.0	4.1		3.5	3.5	3.5	3.5	3.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00	0.98	1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00	1.00	0.99	1.00	
Frt	1.00	1.00		1.00	0.97		1.00	1.00	0.85	1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1805	3527		1805	3459		1793	1900	1578	1778	1676	
Flt Permitted	0.95	1.00		0.95	1.00		0.55	1.00	1.00	0.74	1.00	
Satd. Flow (perm)	1805	3527		1805	3459		1041	1900	1578	1388	1676	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	79	767	16	73	1060	231	14	24	44	213	41	87
RTOR Reduction (vph)	0	0	0	0	6	0	0	0	9	0	27	0
Lane Group Flow (vph)	79	783	0	73	1285	0	14	24	35	213	101	0
Confl. Peds. (#/hr)			6			3	6		4	4		6
Confl. Bikes (#/hr)			5			5			5			5
Heavy Vehicles (%)	0%	2%	0%	0%	1%	1%	0%	0%	0%	1%	0%	0%
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	9.0	85.8		8.7	85.5		24.9	24.9	24.9	24.9	24.9	
Effective Green, g (s)	9.0	85.8		8.7	85.5		24.9	24.9	24.9	24.9	24.9	
Actuated g/C Ratio	0.07	0.66		0.07	0.66		0.19	0.19	0.19	0.19	0.19	
Clearance Time (s)	3.0	4.1		3.0	4.1		3.5	3.5	3.5	3.5	3.5	
Vehicle Extension (s)	2.0	3.0		2.0	3.0		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	124	2327		120	2274		199	363	302	265	321	
v/s Ratio Prot	c0.04	0.22		0.04	c0.37			0.01			0.06	
v/s Ratio Perm							0.01		0.02	c0.15		
v/c Ratio	0.64	0.34		0.61	0.57		0.07	0.07	0.12	0.80	0.31	
Uniform Delay, d1	58.9	9.7		59.0	12.1		43.1	43.0	43.5	50.2	45.2	
Progression Factor	1.00	1.15		1.09	0.97		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	6.2	0.3		5.5	1.0		0.1	0.0	0.1	15.2	0.2	
Delay (s)	65.2	11.5		70.1	12.7		43.1	43.1	43.5	65.4	45.4	
Level of Service	E	B		E	B		D	D	D	E	D	
Approach Delay (s)		16.4			15.8			43.3			57.9	
Approach LOS		B			B			D			E	

Intersection Summary				
HCM 2000 Control Delay	22.3	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.62			
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	10.6	
Intersection Capacity Utilization	68.9%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
17: US 101 SB Ramps & De Long Ave

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	194	696	20	845	0	0	0	0	12	2	313
Future Volume (vph)	0	194	696	20	845	0	0	0	0	12	2	313
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.6	3.6	3.0	3.6					4.0	4.0	
Lane Util. Factor		0.95	1.00	1.00	0.95					0.95	0.95	
Frt		1.00	0.85	1.00	1.00					1.00	0.85	
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (prot)		3574	1599	1770	3539					1681	1506	
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (perm)		3574	1599	1770	3539					1681	1506	
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)	0	206	740	21	899	0	0	0	0	13	2	333
RTOR Reduction (vph)	0	0	293	0	0	0	0	0	0	0	110	0
Lane Group Flow (vph)	0	206	447	21	899	0	0	0	0	12	226	0
Heavy Vehicles (%)	0%	1%	1%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type		NA	Perm	Prot	NA					Split	NA	
Protected Phases		6		5	2					4	4	
Permitted Phases			6									
Actuated Green, G (s)		39.3	39.3	1.4	43.7					13.7	13.7	
Effective Green, g (s)		39.3	39.3	1.4	43.7					13.7	13.7	
Actuated g/C Ratio		0.60	0.60	0.02	0.67					0.21	0.21	
Clearance Time (s)		3.6	3.6	3.0	3.6					4.0	4.0	
Vehicle Extension (s)		4.0	4.0	2.0	4.0					2.5	2.5	
Lane Grp Cap (vph)		2160	966	38	2379					354	317	
v/s Ratio Prot		0.06		c0.01	0.25					0.01	c0.15	
v/s Ratio Perm			c0.28									
v/c Ratio		0.10	0.46	0.55	0.38					0.03	0.71	
Uniform Delay, d1		5.4	7.1	31.5	4.7					20.4	23.8	
Progression Factor		1.01	7.02	1.00	1.00					1.00	1.00	
Incremental Delay, d2		0.1	1.5	9.5	0.5					0.0	6.9	
Delay (s)		5.5	51.0	41.0	5.1					20.4	30.8	
Level of Service		A	D	D	A					C	C	
Approach Delay (s)		41.1			6.0			0.0			30.4	
Approach LOS		D			A			A			C	

Intersection Summary				
HCM 2000 Control Delay	24.8	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.53			
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	10.6	
Intersection Capacity Utilization	66.5%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
18: US 101 NB Ramps & De Long Ave

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	173	34	0	1	58	9	808	2	18	0	0	0
Future Volume (vph)	173	34	0	1	58	9	808	2	18	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.6			3.6		4.5	4.5				
Lane Util. Factor	1.00	0.95			0.95		0.95	0.95				
Frt	1.00	1.00			0.98		1.00	0.99				
Flt Protected	0.95	1.00			1.00		0.95	0.95				
Satd. Flow (prot)	1770	3610			3478		1698	1690				
Flt Permitted	0.95	1.00			0.95		0.95	0.95				
Satd. Flow (perm)	1770	3610			3310		1698	1690				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	188	37	0	1	63	10	878	2	20	0	0	0
RTOR Reduction (vph)	0	0	0	0	9	0	0	2	0	0	0	0
Lane Group Flow (vph)	188	37	0	0	65	0	448	450	0	0	0	0
Heavy Vehicles (%)	2%	0%	0%	0%	0%	12%	1%	0%	8%	0%	0%	0%
Turn Type	Prot	NA			NA		Split	NA				
Protected Phases	1	6			2		4	4				
Permitted Phases												
Actuated Green, G (s)	8.8	16.8			4.5		20.5	20.5				
Effective Green, g (s)	8.8	16.8			4.5		20.5	20.5				
Actuated g/C Ratio	0.19	0.37			0.10		0.45	0.45				
Clearance Time (s)	3.5	3.6			3.6		4.5	4.5				
Vehicle Extension (s)	2.5	2.0			2.0		3.0	3.0				
Lane Grp Cap (vph)	343	1335			328		766	763				
v/s Ratio Prot	c0.11	0.01					0.26	c0.27				
v/s Ratio Perm					c0.02							
v/c Ratio	0.55	0.03			1.00dr		0.58	0.59				
Uniform Delay, d1	16.5	9.1			18.8		9.3	9.3				
Progression Factor	1.00	1.00			1.00		1.00	1.00				
Incremental Delay, d2	1.4	0.0			0.1		1.1	1.2				
Delay (s)	17.9	9.1			18.9		10.4	10.5				
Level of Service	B	A			B		B	B				
Approach Delay (s)		16.5			18.9			10.5			0.0	
Approach LOS		B			B			B			A	

Intersection Summary				
HCM 2000 Control Delay	12.1	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.53			
Actuated Cycle Length (s)	45.4	Sum of lost time (s)	11.6	
Intersection Capacity Utilization	46.3%	ICU Level of Service	A	
Analysis Period (min)	15			

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

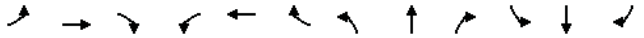
HCM Signalized Intersection Capacity Analysis
19: Redwood Blvd & Lamont Ave 02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	2	8	105	2	51	17	269	41	65	496	29
Future Volume (vph)	11	2	8	105	2	51	17	269	41	65	496	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	3.5		3.5	3.5	3.5	4.8		3.5	4.8	4.8
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes		1.00	1.00		1.00	0.99	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85		1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected		0.96	1.00		0.95	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1821	1615		1811	1595	1805	3527		1805	3610	1615
Flt Permitted		0.84	1.00		0.74	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1588	1615		1399	1595	1805	3527		1805	3610	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	12	2	9	114	2	55	18	292	45	71	539	32
RTOR Reduction (vph)	0	0	7	0	0	40	0	12	0	0	0	18
Lane Group Flow (vph)	0	14	2	0	116	15	18	325	0	71	539	14
Confl. Peds. (#/hr)	1					1			2			
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8		8	4		4						2
Actuated Green, G (s)		12.7	12.7		12.7	12.7	0.9	18.8		3.1	21.0	21.0
Effective Green, g (s)		12.7	12.7		12.7	12.7	0.9	18.8		3.1	21.0	21.0
Actuated g/C Ratio		0.27	0.27		0.27	0.27	0.02	0.41		0.07	0.45	0.45
Clearance Time (s)		3.5	3.5		3.5	3.5	3.5	4.8		3.5	4.8	4.8
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0	3.0		2.0	3.0	3.0
Lane Grp Cap (vph)		434	442		382	436	35	1429		120	1633	730
v/s Ratio Prot							0.01	0.09		c0.04	c0.15	
v/s Ratio Perm		0.01	0.00		c0.08	0.01						0.01
v/c Ratio		0.03	0.01		0.30	0.03	0.51	0.23		0.59	0.33	0.02
Uniform Delay, d1		12.3	12.3		13.3	12.4	22.5	9.0		21.0	8.2	7.0
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		0.0	0.0		0.2	0.0	5.2	0.1		5.1	0.1	0.0
Delay (s)		12.4	12.3		13.5	12.4	27.7	9.1		26.2	8.3	7.0
Level of Service		B	B		B	B	C	A		C	A	A
Approach Delay (s)		12.3			13.1			10.1			10.2	
Approach LOS		B			B			B			B	

Intersection Summary				
HCM 2000 Control Delay	10.6	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.34			
Actuated Cycle Length (s)	46.4	Sum of lost time (s)	11.8	
Intersection Capacity Utilization	45.1%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
20: Redwood Blvd & Landing Ct 02/15/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	0	1	25	0	12	1	312	32	25	485	1
Future Volume (vph)	2	0	1	25	0	12	1	312	32	25	485	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5		3.5		3.5		4.8	4.8	3.5	4.8	4.8
Lane Util. Factor		1.00		1.00		1.00		0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes		1.00		1.00		1.00		1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes		1.00		1.00		1.00		1.00	1.00	1.00	1.00	1.00
Frt		0.95		1.00		0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected		0.97		0.95		1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1748		1803		1615		3609	1579	1805	3610	1572
Flt Permitted		0.97		0.76		1.00		0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1748		1434		1615		3444	1579	1805	3610	1572
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2	0	1	27	0	13	1	339	35	27	527	1
RTOR Reduction (vph)	0	3	0	0	0	11	0	0	14	0	0	0
Lane Group Flow (vph)	0	0	0	27	0	2	0	340	21	27	527	1
Confl. Peds. (#/hr)			4	4					3			6
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA		Perm		Perm	Perm	NA	Perm	Prot	NA	Perm
Protected Phases		4						2		1	6	
Permitted Phases	4			8		8	2		2			6
Actuated Green, G (s)		5.5		5.5		5.5		26.1	26.1	0.8	30.4	30.4
Effective Green, g (s)		5.5		5.5		5.5		26.1	26.1	0.8	30.4	30.4
Actuated g/C Ratio		0.12		0.12		0.12		0.59	0.59	0.02	0.69	0.69
Clearance Time (s)		3.5		3.5		3.5		4.8	4.8	3.5	4.8	4.8
Vehicle Extension (s)		3.0		2.0		2.0		4.0	4.0	2.0	4.0	4.0
Lane Grp Cap (vph)		217		178		200		2033	932	32	2482	1081
v/s Ratio Prot										c0.01	c0.15	
v/s Ratio Perm		0.00		c0.02		0.00		0.10	0.01			0.00
v/c Ratio		0.00		0.15		0.01		0.17	0.02	0.84	0.21	0.00
Uniform Delay, d1		16.9		17.3		17.0		4.1	3.8	21.6	2.5	2.2
Progression Factor		1.00		1.00		1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.0		0.1		0.0		0.1	0.0	93.1	0.1	0.0
Delay (s)		16.9		17.4		17.0		4.2	3.8	114.7	2.6	2.2
Level of Service		B		B		B		A	A	F	A	A
Approach Delay (s)		16.9			17.3			4.1			8.0	
Approach LOS		B			B			A			A	

Intersection Summary				
HCM 2000 Control Delay	6.9	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.23			
Actuated Cycle Length (s)	44.2	Sum of lost time (s)	11.8	
Intersection Capacity Utilization	40.6%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
21: Novato Blvd & Center Rd/Garden Ct

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	0	305	3	0	3	124	473	4	1	696	69
Future Volume (vph)	57	0	305	3	0	3	124	473	4	1	696	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.2	3.2			3.0		3.0	4.4		3.0	4.4	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.85			0.93		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1615			1729		1805	3605		1805	3519	
Flt Permitted	0.75	1.00			0.59		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1432	1615			1053		1805	3605		1805	3519	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	62	0	332	3	0	3	135	514	4	1	757	75
RTOR Reduction (vph)	0	293	0	0	5	0	0	0	0	0	4	0
Lane Group Flow (vph)	62	39	0	0	1	0	135	518	0	1	828	0
Confl. Peds. (#/hr)									9			6
Confl. Bikes (#/hr)									2			
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4								
Actuated Green, G (s)	11.7	11.7			11.9		12.4	75.5		2.2	65.3	
Effective Green, g (s)	11.7	11.7			11.9		12.4	75.5		2.2	65.3	
Actuated g/C Ratio	0.12	0.12			0.12		0.12	0.76		0.02	0.65	
Clearance Time (s)	3.2	3.2			3.0		3.0	4.4		3.0	4.4	
Vehicle Extension (s)	3.0	3.0			2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	167	188			125		223	2721		39	2297	
v/s Ratio Prot		0.02					c0.07	0.14		0.00	c0.24	
v/s Ratio Perm	c0.04				0.00							
v/c Ratio	0.37	0.21			0.01		0.61	0.19		0.03	0.36	
Uniform Delay, d1	40.8	40.0			38.8		41.5	3.5		47.9	7.9	
Progression Factor	1.00	1.00			1.00		0.68	1.38		1.00	1.00	
Incremental Delay, d2	1.4	0.5			0.0		3.1	0.2		0.1	0.4	
Delay (s)	42.1	40.5			38.8		31.3	5.0		47.9	8.3	
Level of Service	D	D			D		C	A		D	A	
Approach Delay (s)		40.8			38.8			10.4			8.4	
Approach LOS		D			D			B			A	

Intersection Summary				
HCM 2000 Control Delay	15.9	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.40			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.6	
Intersection Capacity Utilization	59.0%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
22: Novato Blvd & Arthur St

02/15/2018

Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	162	129	229	513	19	878	186
Future Volume (vph)	162	129	229	513	19	878	186
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5	3.5	4.9	3.5	4.9	
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	0.95	
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	0.99	
Flpb, ped/bikes	0.99	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	1.00	0.97	
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1785	1579	1805	3610	1805	3468	
Flt Permitted	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (perm)	1785	1579	1805	3610	1805	3468	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	176	140	249	558	21	954	202
RTOR Reduction (vph)	0	118	0	0	0	13	0
Lane Group Flow (vph)	176	22	249	558	21	1143	0
Confl. Peds. (#/hr)	10	8					5
Confl. Bikes (#/hr)		1					
Heavy Vehicles (%)	0%	0%	0%	0%	0%	1%	0%
Turn Type	Perm	Perm	Prot	NA	Prot	NA	
Protected Phases			1	6	5	2	
Permitted Phases	4	4					
Actuated Green, G (s)	15.7	15.7	17.8	69.7	2.7	54.6	
Effective Green, g (s)	15.7	15.7	17.8	69.7	2.7	54.6	
Actuated g/C Ratio	0.16	0.16	0.18	0.70	0.03	0.55	
Clearance Time (s)	3.5	3.5	3.5	4.9	3.5	4.9	
Vehicle Extension (s)	2.0	2.0	2.0	4.0	2.0	4.0	
Lane Grp Cap (vph)	280	247	321	2516	48	1893	
v/s Ratio Prot			c0.14	0.15	0.01	c0.33	
v/s Ratio Perm	c0.10	0.01					
v/c Ratio	0.63	0.09	0.78	0.22	0.44	0.60	
Uniform Delay, d1	39.4	36.0	39.2	5.4	47.9	15.4	
Progression Factor	1.00	1.00	0.80	1.11	1.37	0.74	
Incremental Delay, d2	3.2	0.1	8.4	0.2	2.2	1.4	
Delay (s)	42.6	36.1	39.9	6.2	67.8	12.8	
Level of Service	D	D	D	A	E	B	
Approach Delay (s)	39.7			16.6		13.7	
Approach LOS	D			B		B	

Intersection Summary				
HCM 2000 Control Delay	18.3	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.64			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.9	
Intersection Capacity Utilization	65.9%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
23: Novato Blvd & Rowland Blvd

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	140	16	355	321	348	45	306	221	410	426	187
Future Volume (vph)	45	140	16	355	321	348	45	306	221	410	426	187
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5		3.5	4.1	4.1	3.5	4.1		3.5	4.4	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		0.97	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.99	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	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.94		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1857		1770	1900	1576	1805	1746		3502	1791	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1805	1857		1770	1900	1576	1805	1746		3502	1791	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	47	147	17	374	338	366	47	322	233	432	448	197
RTOR Reduction (vph)	0	5	0	0	0	254	0	25	0	0	13	0
Lane Group Flow (vph)	47	159	0	374	338	112	47	530	0	432	632	0
Confl. Peds. (#/hr)			24			2			13			10
Confl. Bikes (#/hr)			1						1			
Heavy Vehicles (%)	0%	0%	0%	2%	0%	1%	0%	0%	2%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases						4						
Actuated Green, G (s)	5.4	18.0		18.5	30.5	30.5	6.0	32.7		16.2	42.6	
Effective Green, g (s)	5.4	18.0		18.5	30.5	30.5	6.0	32.7		16.2	42.6	
Actuated g/C Ratio	0.05	0.18		0.18	0.30	0.30	0.06	0.33		0.16	0.43	
Clearance Time (s)	3.5	3.5		3.5	4.1	4.1	3.5	4.1		3.5	4.4	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	3.0		2.0	2.0	
Lane Grp Cap (vph)	97	334		327	579	480	108	570		567	762	
v/s Ratio Prot	0.03	0.09		c0.21	c0.18		0.03	c0.30		c0.12	0.35	
v/s Ratio Perm						0.07						
v/c Ratio	0.48	0.48		1.14	0.58	0.23	0.44	0.93		0.76	0.83	
Uniform Delay, d1	45.9	36.8		40.8	29.4	26.0	45.4	32.5		40.1	25.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.38	0.61	
Incremental Delay, d2	1.4	0.4		94.6	1.0	0.1	1.0	23.9		4.6	8.6	
Delay (s)	47.3	37.2		135.4	30.4	26.1	46.4	56.4		60.0	24.2	
Level of Service	D	D		F	C	C	D	E		E	C	
Approach Delay (s)		39.4			65.3			55.6			38.5	
Approach LOS		D			E			E			D	

Intersection Summary						
HCM 2000 Control Delay	51.8	HCM 2000 Level of Service	D			
HCM 2000 Volume to Capacity ratio	0.89					
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.5			
Intersection Capacity Utilization	91.1%	ICU Level of Service	F			
Analysis Period (min)	15					
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis
24: Redwood Blvd & Rowland Blvd

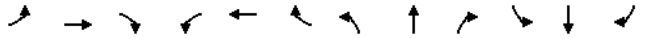
02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	115	699	49	21	795	288	72	23	81	302	19	301
Future Volume (vph)	115	699	49	21	795	288	72	23	81	302	19	301
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.4	4.4	3.5	3.7	3.7	3.5	4.1		3.5	4.8	4.8
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.99	1.00	0.99		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		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1805	3574	1589	1805	3574	1578	1805	3150		3502	1900	1593
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1805	3574	1589	1805	3574	1578	1805	3150		3502	1900	1593
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	125	760	53	23	864	313	78	25	88	328	21	327
RTOR Reduction (vph)	0	0	28	0	0	77	0	76	0	0	0	245
Lane Group Flow (vph)	125	760	25	23	864	236	78	37	0	328	21	82
Confl. Peds. (#/hr)			6			2			3			2
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	0%	1%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						4
Actuated Green, G (s)	11.2	38.4	38.4	3.0	30.9	30.9	8.0	10.7		12.6	14.6	14.6
Effective Green, g (s)	11.2	38.4	38.4	3.0	30.9	30.9	8.0	10.7		12.6	14.6	14.6
Actuated g/C Ratio	0.14	0.48	0.48	0.04	0.39	0.39	0.10	0.13		0.16	0.18	0.18
Clearance Time (s)	3.5	4.4	4.4	3.5	3.7	3.7	3.5	4.1		3.5	4.8	4.8
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	2.0	2.5		2.5	2.5	2.5
Lane Grp Cap (vph)	252	1711	760	67	1377	607	180	420		550	345	289
v/s Ratio Prot	c0.07	0.21		0.01	c0.24		0.04	0.01		c0.09	0.01	
v/s Ratio Perm			0.02			0.15						c0.05
v/c Ratio	0.50	0.44	0.03	0.34	0.63	0.39	0.43	0.09		0.60	0.06	0.29
Uniform Delay, d1	31.9	13.8	11.1	37.6	20.0	17.8	34.0	30.5		31.4	27.1	28.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.6	0.3	0.0	1.1	1.0	0.6	0.6	0.1		1.5	0.1	0.4
Delay (s)	32.5	14.1	11.1	38.8	21.0	18.4	34.6	30.5		32.9	27.2	28.7
Level of Service	C	B	B	D	C	B	C	C		C	C	C
Approach Delay (s)		16.4			20.7			32.2			30.7	
Approach LOS		B			C			C			C	

Intersection Summary						
HCM 2000 Control Delay	22.3	HCM 2000 Level of Service	C			
HCM 2000 Volume to Capacity ratio	0.56					
Actuated Cycle Length (s)	80.2	Sum of lost time (s)	16.2			
Intersection Capacity Utilization	60.9%	ICU Level of Service	B			
Analysis Period (min)	15					
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis
25: US 101 SB Ramps & Rowland Blvd

02/15/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	576	475	136	653	0	0	0	0	273	49	489
Future Volume (vph)	0	576	475	136	653	0	0	0	0	273	49	489
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.6	3.6	3.0	3.6					3.0	3.0	
Lane Util. Factor		0.91	0.91	0.97	0.95					0.91	0.91	
Frpb, ped/bikes		1.00	0.99	1.00	1.00					1.00	0.99	
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	
Frt		0.97	0.85	1.00	1.00					1.00	0.87	
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (prot)		3314	1450	3367	3574					1643	2844	
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (perm)		3314	1450	3367	3574					1643	2844	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	626	516	148	710	0	0	0	0	297	53	532
RTOR Reduction (vph)	0	27	213	0	0	0	0	0	0	0	73	0
Lane Group Flow (vph)	0	764	138	148	710	0	0	0	0	267	542	0
Confl. Peds. (#/hr)			2									2
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	0%	1%	0%	4%	1%	0%	0%	0%	0%	0%	40%	1%
Turn Type		NA	Perm	Prot	NA					Split	NA	
Protected Phases		2		1	6					4	4	
Permitted Phases			2									
Actuated Green, G (s)		19.0	19.0	3.8	25.8					15.8	15.8	
Effective Green, g (s)		19.0	19.0	3.8	25.8					15.8	15.8	
Actuated g/C Ratio		0.39	0.39	0.08	0.54					0.33	0.33	
Clearance Time (s)		3.6	3.6	3.0	3.6					3.0	3.0	
Vehicle Extension (s)		4.0	4.0	2.0	2.5					2.0	2.0	
Lane Grp Cap (vph)		1306	571	265	1913					538	932	
v/s Ratio Prot		c0.23		c0.04	0.20					0.16	c0.19	
v/s Ratio Perm			0.10									
v/c Ratio		0.59	0.24	0.56	0.37					0.50	0.94dr	
Uniform Delay, d1		11.5	9.8	21.4	6.5					13.0	13.5	
Progression Factor		1.00	1.00	1.00	1.00					1.00	1.00	
Incremental Delay, d2		0.8	0.3	1.5	0.1					0.3	0.6	
Delay (s)		12.3	10.1	22.8	6.6					13.3	14.1	
Level of Service		B	B	C	A					B	B	
Approach Delay (s)		11.6			9.4			0.0			13.8	
Approach LOS		B			A			A			B	

Intersection Summary				
HCM 2000 Control Delay	11.6	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.58			
Actuated Cycle Length (s)	48.2	Sum of lost time (s)	9.6	
Intersection Capacity Utilization	52.5%	ICU Level of Service	A	
Analysis Period (min)	15			

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
26: US 101 NB Ramps & Rowland Blvd

02/15/2018

Movement	EBL2	EBL	EBT	WBT	WBR	WBR2	NBL2	NBL	NBT	NBR	NEL2	NEL
Lane Configurations												
Traffic Volume (vph)	28	243	607	312	2	144	486	8	9	426	13	4
Future Volume (vph)	28	243	607	312	2	144	486	8	9	426	13	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.6	3.6		3.6	3.5		3.5	3.0		3.5
Lane Util. Factor		1.00	0.95	0.86		0.86	0.95		0.95	0.88		1.00
Frpb, ped/bikes		1.00	1.00	1.00		1.00	1.00		1.00	1.00		1.00
Flpb, ped/bikes		1.00	1.00	1.00		1.00	1.00		1.00	1.00		1.00
Frt		1.00	1.00	0.98		0.85	1.00		1.00	0.85		0.99
Flt Protected		0.95	1.00	1.00		1.00	0.95		0.95	1.00		0.96
Satd. Flow (prot)		1805	3574	4621		1323	1715		1681	2787		1794
Flt Permitted		0.95	1.00	1.00		1.00	0.95		0.95	1.00		0.96
Satd. Flow (perm)		1805	3574	4621		1323	1715		1681	2787		1794
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	30	264	660	339	2	157	528	9	10	463	14	4
RTOR Reduction (vph)	0	0	0	14	0	87	0	0	0	0	0	0
Lane Group Flow (vph)	0	294	660	373	0	24	275	0	272	463	0	20
Confl. Peds. (#/hr)										2		
Heavy Vehicles (%)	0%	0%	1%	4%	0%	5%	0%	0%	67%	2%	0%	0%
Turn Type	Prot	Prot	NA	NA		Perm	Split	Split	NA	custom	Perm	Prot
Protected Phases	5	5	2	6			8	8	8	1 8		7
Permitted Phases						6					7	
Actuated Green, G (s)		16.4	18.0	14.1		14.1	16.9		16.9	32.9		3.1
Effective Green, g (s)		16.4	18.0	14.1		14.1	16.9		16.9	29.4		3.1
Actuated g/C Ratio		0.26	0.28	0.22		0.22	0.26		0.26	0.46		0.05
Clearance Time (s)		3.0	3.6	3.6		3.6	3.5		3.5			3.5
Vehicle Extension (s)		2.0	2.0	2.0		2.0	2.0		2.0			2.0
Lane Grp Cap (vph)		461	1003	1016		291	452		443	1278		86
v/s Ratio Prot		0.16	c0.18	c0.08			0.16		c0.16	0.17		
v/s Ratio Perm						0.02						0.01
v/c Ratio		0.64	0.66	0.37		0.08	0.61		0.61	0.36		0.23
Uniform Delay, d1		21.2	20.3	21.2		19.9	20.7		20.7	11.3		29.4
Progression Factor		1.00	1.00	1.00		1.00	1.00		1.00	1.00		1.00
Incremental Delay, d2		2.1	1.2	0.1		0.0	1.6		1.8	0.1		0.5
Delay (s)		23.3	21.5	21.3		19.9	22.3		22.5	11.3		29.9
Level of Service		C	C	C		B	C		C	B		C
Approach Delay (s)			22.1	21.0					17.3			29.9
Approach LOS			C	C					B			C

Intersection Summary				
HCM 2000 Control Delay	20.0	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.55			
Actuated Cycle Length (s)	64.1	Sum of lost time (s)	13.6	
Intersection Capacity Utilization	62.4%	ICU Level of Service	B	
Analysis Period (min)	15			

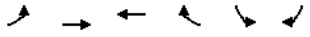
c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
26: US 101 NB Ramps & Rowland Blvd 02/15/2018

Movement	NER
Lane Configurations	
Traffic Volume (vph)	2
Future Volume (vph)	2
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	2
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	0%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM Signalized Intersection Capacity Analysis
27: Rowland Blvd & Rowland Way 02/15/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	421	626	366	23	13	86
Future Volume (vph)	421	626	366	23	13	86
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.6	3.2		3.2	3.2
Lane Util. Factor	0.97	0.91	0.95		1.00	0.95
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		0.89	0.85
Flt Protected	0.95	1.00	1.00		0.99	1.00
Satd. Flow (prot)	3467	5085	3397		1607	1490
Flt Permitted	0.95	1.00	1.00		0.99	1.00
Satd. Flow (perm)	3467	5085	3397		1607	1490
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	458	680	398	25	14	93
RTOR Reduction (vph)	0	0	5	0	34	46
Lane Group Flow (vph)	458	680	418	0	20	7
Confl. Peds. (#/hr)				1	2	
Heavy Vehicles (%)	1%	2%	5%	9%	6%	3%
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases						4
Actuated Green, G (s)	13.0	32.0	15.9		6.2	6.2
Effective Green, g (s)	13.0	32.0	15.9		6.2	6.2
Actuated g/C Ratio	0.29	0.71	0.35		0.14	0.14
Clearance Time (s)	3.5	3.6	3.2		3.2	3.2
Vehicle Extension (s)	2.0	4.0	4.0		2.0	2.0
Lane Grp Cap (vph)	1001	3616	1200		221	205
v/s Ratio Prot	c0.13	0.13	c0.12		c0.01	
v/s Ratio Perm						0.00
v/c Ratio	0.46	0.19	0.35		0.09	0.04
Uniform Delay, d1	13.1	2.2	10.7		16.9	16.8
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.1	0.0	0.2		0.1	0.0
Delay (s)	13.2	2.2	11.0		17.0	16.8
Level of Service	B	A	B		B	B
Approach Delay (s)		6.6	11.0		16.9	
Approach LOS		A	B		B	

Intersection Summary				
HCM 2000 Control Delay	8.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	45.0	Sum of lost time (s)	9.9
Intersection Capacity Utilization	38.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
28: Vintage Way & Rowland Blvd

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	335	300	2	242	3	130	3	0	1	2	1
Future Volume (vph)	7	335	300	2	242	3	130	3	0	1	2	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.6	3.6	3.0	3.6		3.6	3.6			3.2	
Lane Util. Factor	1.00	0.95	0.88	1.00	0.95		0.97	1.00			1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00			0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1805	3195	2814	1805	3249		3367	1900			1813	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00			0.99	
Satd. Flow (perm)	1805	3195	2814	1805	3249		3367	1900			1813	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	8	364	326	2	263	3	141	3	0	1	2	1
RTOR Reduction (vph)	0	0	0	0	1	0	0	0	0	0	1	0
Lane Group Flow (vph)	8	364	326	2	265	0	141	3	0	0	3	0
Confl. Peds. (#/hr)			1			3			1			
Confl. Bikes (#/hr)			2			2						
Heavy Vehicles (%)	0%	13%	1%	0%	11%	0%	4%	0%	0%	0%	0%	0%
Turn Type	Prot	NA	pt+ov	Prot	NA		Split	NA		Split	NA	
Protected Phases	5	2	2 3	1	6		3	3		4	4	
Permitted Phases												
Actuated Green, G (s)	1.1	10.8	30.9	0.5	10.2		16.5	16.5			1.1	
Effective Green, g (s)	1.1	10.8	30.9	0.5	10.2		16.5	16.5			1.1	
Actuated g/C Ratio	0.03	0.26	0.73	0.01	0.24		0.39	0.39			0.03	
Clearance Time (s)	3.0	3.6		3.0	3.6		3.6	3.6			3.2	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		3.0	3.0			2.0	
Lane Grp Cap (vph)	46	815	2055	21	783		1313	741			47	
v/s Ratio Prot	c0.00	c0.11	c0.12	0.00	0.08		0.04	0.00			c0.00	
v/s Ratio Perm												
v/c Ratio	0.17	0.45	0.16	0.10	0.34		0.11	0.00			0.06	
Uniform Delay, d1	20.2	13.2	1.7	20.7	13.3		8.2	7.9			20.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.7	0.1	0.0	0.7	0.1		0.0	0.0			0.2	
Delay (s)	20.8	13.4	1.8	21.4	13.4		8.2	7.9			20.3	
Level of Service	C	B	A	C	B		A	A			C	
Approach Delay (s)		8.0			13.4			8.2			20.3	
Approach LOS		A			B			A			C	

Intersection Summary				
HCM 2000 Control Delay	9.4	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.28			
Actuated Cycle Length (s)	42.3	Sum of lost time (s)	13.4	
Intersection Capacity Utilization	36.0%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
29: Novato Blvd & Sunset Pkwy

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	242	68	26	39	102	101	25	256	56	54	342	312
Future Volume (vph)	242	68	26	39	102	101	25	256	56	54	342	312
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.0		3.5	3.5		3.5	4.9		3.5	4.6	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	0.97		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	0.96		1.00	0.93		1.00	0.97		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	1809		1805	1711		1805	1841		1770	1716	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1787	1809		1805	1711		1805	1841		1770	1716	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	263	74	28	42	111	110	27	278	61	59	372	339
RTOR Reduction (vph)	0	14	0	0	39	0	0	7	0	0	29	0
Lane Group Flow (vph)	263	88	0	42	182	0	27	332	0	59	682	0
Confl. Peds. (#/hr)			4			21			3			5
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	0%	0%	0%	2%	1%	2%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases												
Actuated Green, G (s)	12.8	23.0		5.7	16.4		3.4	32.6		5.7	35.2	
Effective Green, g (s)	12.8	23.0		5.7	16.4		3.4	32.6		5.7	35.2	
Actuated g/C Ratio	0.15	0.28		0.07	0.20		0.04	0.39		0.07	0.42	
Clearance Time (s)	3.5	4.0		3.5	3.5		3.5	4.9		3.5	4.6	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	275	501		124	338		74	723		121	728	
v/s Ratio Prot	c0.15	0.05		0.02	c0.11		0.01	0.18		c0.03	c0.40	
v/s Ratio Perm												
v/c Ratio	0.96	0.18		0.34	0.54		0.36	0.46		0.49	0.94	
Uniform Delay, d1	34.8	22.8		36.8	29.8		38.7	18.6		37.2	22.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	41.8	0.1		0.6	0.8		1.1	0.2		1.1	19.2	
Delay (s)	76.5	22.8		37.4	30.7		39.8	18.8		38.3	42.0	
Level of Service	E	C		D	C		D	B		D	D	
Approach Delay (s)		61.5			31.7			20.3			41.7	
Approach LOS		E			C			C			D	

Intersection Summary				
HCM 2000 Control Delay	39.9	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.84			
Actuated Cycle Length (s)	82.9	Sum of lost time (s)	15.9	
Intersection Capacity Utilization	86.3%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Intersection	
Intersection Delay, s/veh	237.3
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	49	486	392	327	180	28	95	6	71	99	22	67
Future Vol, veh/h	49	486	392	327	180	28	95	6	71	99	22	67
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	1	2	1	1	2	1	1	1	1	1	1	1
Mvmt Flow	52	512	413	344	189	29	100	6	75	104	23	71
Number of Lanes	1	1	0	1	1	0	1	1	1	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	3	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	2	2	2
HCM Control Delay	440.3	33.6	17	17.3
HCM LOS	F	D	C	C

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	100%	0%	0%	55%	0%	87%	0%	25%
Vol Right, %	0%	0%	100%	0%	45%	0%	13%	0%	75%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	95	6	71	49	878	327	208	99	89
LT Vol	95	0	0	49	0	327	0	99	0
Through Vol	0	6	0	0	486	0	180	0	22
RT Vol	0	0	71	0	392	0	28	0	67
Lane Flow Rate	100	6	75	52	924	344	219	104	94
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.266	0.016	0.174	0.122	1.975	0.795	0.471	0.274	0.22
Departure Headway (Hd)	11.599	11.07	10.329	8.505	7.692	10.01	9.411	11.498	10.407
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	312	325	350	424	481	365	385	315	348
Service Time	9.299	8.77	8.029	6.205	5.392	7.71	7.111	9.198	8.107
HCM Lane V/C Ratio	0.321	0.018	0.214	0.123	1.921	0.942	0.569	0.33	0.27
HCM Control Delay	18.5	13.9	15.2	12.4	464.2	42.1	20.2	18.5	16
HCM Lane LOS	C	B	C	B	F	E	C	C	C
HCM 95th-tile Q	1	0	0.6	0.4	62.6	6.7	2.4	1.1	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	49	486	392	327	180	28	95	6	71	99	22	67
Future Volume (vph)	49	486	392	327	180	28	95	6	71	99	22	67
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	16	12	16	16	12	12	12	12	12	12
Total Lost time (s)	3.5	4.0		3.5	4.0		3.5	4.0	4.0	3.5	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.93		1.00	0.98		1.00	1.00	0.85	1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1787	1978		1787	2072		1787	1881	1599	1787	1668	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1787	1978		1787	2072		1787	1881	1599	1787	1668	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	52	512	413	344	189	29	100	6	75	104	23	71
RTOR Reduction (vph)	0	20	0	0	3	0	0	0	69	0	64	0
Lane Group Flow (vph)	52	905	0	344	215	0	100	6	6	104	30	0
Heavy Vehicles (%)	1%	2%	1%	1%	2%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	6.9	56.0		25.6	74.7		8.5	8.8	8.8	10.5	10.8	
Effective Green, g (s)	6.9	56.0		25.6	74.7		8.5	8.8	8.8	10.5	10.8	
Actuated g/C Ratio	0.06	0.48		0.22	0.64		0.07	0.08	0.08	0.09	0.09	
Clearance Time (s)	3.5	4.0		3.5	4.0		3.5	4.0	4.0	3.5	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	106	955		394	1335		131	142	121	161	155	
v/s Ratio Prot	0.03	c0.46		c0.19	0.10		c0.06	0.00		0.06	c0.02	
v/s Ratio Perm									0.00			
v/c Ratio	0.49	0.95		0.87	0.16		0.76	0.04	0.05	0.65	0.19	
Uniform Delay, d1	52.8	28.5		43.6	8.2		52.7	49.6	49.7	50.9	48.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.5	17.6		18.7	0.1		22.8	0.1	0.2	8.6	0.6	
Delay (s)	56.3	46.2		62.3	8.2		75.5	49.8	49.8	59.5	49.1	
Level of Service	E	D		E	A		E	D	D	E	D	
Approach Delay (s)		46.7			41.3			64.0			54.6	
Approach LOS		D			D			E			D	

Intersection Summary			
HCM 2000 Control Delay	47.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	115.9	Sum of lost time (s)	15.0
Intersection Capacity Utilization	89.8%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

MOVEMENT SUMMARY

Site: 30 [AM Cumulative]

Novato Boulevard/Redwood Boulevard
AM Cumulative with Project

Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NB Redwood Boulevard											
3	L2	102	2.0	0.278	8.9	LOS A	1.2	30.1	0.66	0.66	31.6
8	T1	6	2.0	0.278	8.9	LOS A	1.2	30.1	0.66	0.66	31.6
18	R2	76	2.0	0.278	8.9	LOS A	1.2	30.1	0.66	0.66	30.8
Approach		185	2.0	0.278	8.9	LOS A	1.2	30.1	0.66	0.66	31.3
East: WB Novato Blvd											
1	L2	352	2.0	0.503	8.8	LOS A	3.5	87.9	0.50	0.33	31.6
6	T1	194	2.0	0.503	8.8	LOS A	3.5	87.9	0.50	0.33	31.6
16	R2	30	2.0	0.503	8.8	LOS A	3.5	87.9	0.50	0.33	30.8
Approach		575	2.0	0.503	8.8	LOS A	3.5	87.9	0.50	0.33	31.5
North: SB Redwood Boulevard											
7	L2	106	2.0	0.293	8.8	LOS A	1.3	32.4	0.66	0.66	31.7
4	T1	24	2.0	0.293	8.8	LOS A	1.3	32.4	0.66	0.66	31.7
14	R2	72	2.0	0.293	8.8	LOS A	1.3	32.4	0.66	0.66	30.9
Approach		202	2.0	0.293	8.8	LOS A	1.3	32.4	0.66	0.66	31.4
West: EB Novato Blvd											
5	L2	53	2.0	0.756	20.9	LOS C	8.6	218.9	0.77	1.13	27.9
2	T1	523	2.0	0.756	20.9	LOS C	8.6	218.9	0.77	1.13	27.9
12	R2	422	2.0	0.473	10.0	LOS A	3.0	77.2	0.65	0.71	31.4
Approach		997	2.0	0.756	16.3	LOS B	8.6	218.9	0.72	0.95	29.3
All Vehicles		1959	2.0	0.756	12.6	LOS B	8.6	218.9	0.64	0.71	30.3

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Organisation: W-TRANS | Processed: Tuesday, February 27, 2018 4:02:32 PM
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HCM Signalized Intersection Capacity Analysis
31: Alameda Del Prado & Ignacio Blvd

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	890	469	268	373	19	69	4	240	7	2	0
Future Volume (vph)	13	890	469	268	373	19	69	4	240	7	2	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.6	3.6	3.0	3.6			3.5	3.5		3.7	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00			1.00	0.98		1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00			0.99	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	0.99			1.00	0.85		1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00		0.96	
Satd. Flow (prot)	1770	3610	1573	1900	3584			1786	1589		1824	
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.73	1.00		0.85	
Satd. Flow (perm)	1770	3610	1573	1805	3584			1368	1589		1608	
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)	14	927	489	279	389	20	72	4	250	7	2	0
RTOR Reduction (vph)	0	0	88	0	2	0	0	0	217	0	0	0
Lane Group Flow (vph)	14	927	401	279	407	0	0	76	33	0	9	0
Confl. Peds. (#/hr)			4				7		4	4		7
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2				8		8	4		
Actuated Green, G (s)	1.4	49.2	49.2	27.4	75.2			13.3	13.3		13.1	
Effective Green, g (s)	1.4	49.2	49.2	27.4	75.2			13.3	13.3		13.1	
Actuated g/C Ratio	0.01	0.49	0.49	0.27	0.75			0.13	0.13		0.13	
Clearance Time (s)	3.0	3.6	3.6	3.0	3.6			3.5	3.5		3.7	
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0			2.0	2.0		2.0	
Lane Grp Cap (vph)	24	1776	773	520	2695			181	211		210	
v/s Ratio Prot	0.01	c0.26		c0.15	0.11							
v/s Ratio Perm			0.25					c0.06	0.02		0.01	
v/c Ratio	0.58	0.52	0.52	0.54	0.15			0.42	0.16		0.04	
Uniform Delay, d1	49.0	17.4	17.3	30.9	3.5			39.8	38.4		38.0	
Progression Factor	1.00	1.00	1.00	0.66	0.48			1.00	1.00		1.00	
Incremental Delay, d2	21.1	1.1	2.5	0.5	0.1			0.6	0.1		0.0	
Delay (s)	70.1	18.5	19.8	20.9	1.8			40.4	38.5		38.0	
Level of Service	E	B	B	C	A			D	D		D	
Approach Delay (s)		19.4			9.5			39.0			38.0	
Approach LOS		B			A			D			D	

Intersection Summary			
HCM 2000 Control Delay	19.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.3
Intersection Capacity Utilization	63.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
32: US 101 SB Off Ramp/Enfrente Rd & Ignacio Blvd

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	864	314	203	438	43	0	0	1163	265	143	218
Future Volume (vph)	36	864	314	203	438	43	0	0	1163	265	143	218
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			2%			0%	
Total Lost time (s)	3.0	8.0	8.0	4.0	5.0				4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95				0.88		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.96	1.00	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	1.00	0.85	1.00	0.99				0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00				1.00		0.97	1.00
Satd. Flow (prot)	1805	3610	1550	1770	3544				2759		1809	1578
Flt Permitted	0.95	1.00	1.00	0.95	1.00				1.00		0.97	1.00
Satd. Flow (perm)	1805	3610	1550	1770	3544				2759		1809	1578
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)	38	900	327	211	456	45	0	0	1211	276	149	227
RTOR Reduction (vph)	0	0	134	0	6	0	0	0	323	0	0	163
Lane Group Flow (vph)	38	900	193	211	495	0	0	0	888	0	425	64
Confl. Peds. (#/hr)			7			20						1
Confl. Bikes (#/hr)						3						
Heavy Vehicles (%)	0%	0%	0%	2%	0%	0%	0%	0%	2%	0%	5%	1%
Turn Type	Prot	NA	Perm	Prot	NA				Over	Split	NA	Perm
Protected Phases	5	2		1	6				1	7	7	
Permitted Phases			2									7
Actuated Green, G (s)	6.6	28.5	28.5	27.2	53.1				27.2		28.3	28.3
Effective Green, g (s)	6.6	28.5	28.5	27.2	53.1				27.2		28.3	28.3
Actuated g/C Ratio	0.07	0.28	0.28	0.27	0.53				0.27		0.28	0.28
Clearance Time (s)	3.0	8.0	8.0	4.0	5.0				4.0		4.0	4.0
Vehicle Extension (s)	2.0	2.5	2.5	3.0	4.0				3.0		2.5	2.5
Lane Grp Cap (vph)	119	1028	441	481	1881				750		511	446
v/s Ratio Prot	0.02	c0.25		0.12	0.14				c0.32		c0.23	
v/s Ratio Perm			0.12									0.04
v/c Ratio	0.32	0.88	0.44	0.44	0.26				1.18		0.83	0.14
Uniform Delay, d1	44.6	34.1	29.2	30.1	12.8				36.4		33.6	26.8
Progression Factor	0.98	0.73	0.55	1.55	1.83				1.00		1.00	1.00
Incremental Delay, d2	0.5	9.6	2.9	0.6	0.3				96.0		10.9	0.1
Delay (s)	44.1	34.3	18.9	47.2	23.7				132.4		44.5	26.9
Level of Service	D	C	B	D	C				F		D	C
Approach Delay (s)		30.6			30.7			132.4			38.4	
Approach LOS		C			C			F			D	

Intersection Summary				
HCM 2000 Control Delay	64.0	HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio	0.96			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	100.2%	ICU Level of Service	G	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
32: US 101 SB Off Ramp/Enfrente Rd & Ignacio Blvd

02/15/2018

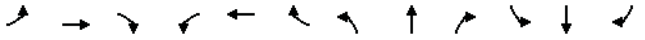
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	864	314	203	438	43	0	0	1163	265	143	218
Future Volume (vph)	36	864	314	203	438	43	0	0	1163	265	143	218
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			2%			0%	
Total Lost time (s)	3.0	8.0	8.0	4.0	5.0				4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95				0.88		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.96	1.00	0.99				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	1.00	0.85	1.00	0.99				0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00				1.00		0.97	1.00
Satd. Flow (prot)	1805	3610	1546	1787	3543				2814		1809	1578
Flt Permitted	0.95	1.00	1.00	0.95	1.00				1.00		0.97	1.00
Satd. Flow (perm)	1805	3610	1546	1787	3543				2814		1809	1578
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)	38	900	327	211	456	45	0	0	1211	276	149	227
RTOR Reduction (vph)	0	0	128	0	6	0	0	0	183	0	0	168
Lane Group Flow (vph)	38	900	199	211	495	0	0	0	1028	0	425	59
Confl. Peds. (#/hr)			7			20						1
Confl. Bikes (#/hr)						3						
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	5%	1%
Turn Type	Prot	NA	Perm	Prot	NA				Over	Split	NA	Perm
Protected Phases	5	2		1	6				1	7	7	
Permitted Phases			2									7
Actuated Green, G (s)	3.6	28.0	28.0	39.1	67.5				39.1		28.9	28.9
Effective Green, g (s)	3.6	28.0	28.0	39.1	67.5				39.1		28.9	28.9
Actuated g/C Ratio	0.03	0.25	0.25	0.35	0.60				0.35		0.26	0.26
Clearance Time (s)	3.0	8.0	8.0	4.0	5.0				4.0		4.0	4.0
Vehicle Extension (s)	2.0	4.0	4.0	3.0	4.0				3.0		2.5	2.5
Lane Grp Cap (vph)	58	902	386	623	2135				982		466	407
v/s Ratio Prot	0.02	c0.25		0.12	0.14				c0.37		c0.23	
v/s Ratio Perm			0.13									0.04
v/c Ratio	0.66	1.00	0.51	0.34	0.23				1.05		0.91	0.14
Uniform Delay, d1	53.6	42.0	36.2	26.9	10.3				36.5		40.3	32.0
Progression Factor	1.28	0.75	0.63	0.71	0.39				1.00		1.00	1.00
Incremental Delay, d2	17.4	28.5	4.5	0.3	0.2				41.8		22.0	0.1
Delay (s)	85.9	60.1	27.1	19.5	4.2				78.2		62.3	32.1
Level of Service	F	E	C	B	A				E		E	C
Approach Delay (s)		52.4			8.7			78.2			51.8	
Approach LOS		D			A			E			D	

Intersection Summary				
HCM 2000 Control Delay	52.3	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.99			
Actuated Cycle Length (s)	112.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	100.2%	ICU Level of Service	G	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
33: Nave Dr & Ignacio Blvd/Bel Marin Keys Blvd

02/15/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	969	1311	101	238	237	447	543	708	0	0	0
Future Volume (vph)	0	969	1311	101	238	237	447	543	708	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.6	3.0	4.0		4.6	4.6	3.0			
Lane Util. Factor		0.95	1.00	1.00	0.95		0.91	0.91	1.00			
Frpb, ped/bikes		1.00	1.00	1.00	0.99		1.00	1.00	0.99			
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00			
Frt		1.00	0.85	1.00	0.93		1.00	1.00	0.85			
Flt Protected		1.00	1.00	0.95	1.00		0.95	0.99	1.00			
Satd. Flow (prot)		3539	1607	1805	3252		1643	3398	1583			
Flt Permitted		1.00	1.00	0.95	1.00		0.95	0.99	1.00			
Satd. Flow (perm)		3539	1607	1805	3252		1643	3398	1583			
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)	0	1031	1395	107	253	252	476	578	753	0	0	0
RTOR Reduction (vph)	0	0	81	0	127	0	0	0	4	0	0	0
Lane Group Flow (vph)	0	1031	1314	107	378	0	343	711	749	0	0	0
Confl. Peds. (#/hr)			1			1			1			
Heavy Vehicles (%)	0%	2%	0%	0%	2%	2%	0%	1%	1%	0%	0%	0%
Turn Type		NA	pm+ov	Prot	NA		Split	NA	pm+ov			
Protected Phases		2	3	1	6		3	3	1			
Permitted Phases			2						3			
Actuated Green, G (s)		28.4	76.4	12.0	43.4		48.0	48.0	60.0			
Effective Green, g (s)		28.4	76.4	12.0	43.4		48.0	48.0	60.0			
Actuated g/C Ratio		0.28	0.76	0.12	0.43		0.48	0.48	0.60			
Clearance Time (s)		4.0	4.6	3.0	4.0		4.6	4.6	3.0			
Vehicle Extension (s)		4.0	2.0	2.0	4.0		2.0	2.0	2.0			
Lane Grp Cap (vph)		1005	1227	216	1411		788	1631	949			
v/s Ratio Prot		0.29	c0.51	0.06	0.12		0.21	0.21	c0.09			
v/s Ratio Perm			0.30						0.38			
v/c Ratio		1.03	1.07	0.50	0.27		0.44	0.44	0.79			
Uniform Delay, d1		35.8	11.8	41.2	18.1		17.1	17.1	15.2			
Progression Factor		0.98	1.28	1.16	0.89		1.00	1.00	1.00			
Incremental Delay, d2		22.4	37.4	0.6	0.5		0.1	0.1	4.1			
Delay (s)		57.4	52.6	48.2	16.6		17.2	17.2	19.3			
Level of Service		E	D	D	B		B	B	B			
Approach Delay (s)		54.6			22.1			18.1			0.0	
Approach LOS		D			C			B			A	

Intersection Summary				
HCM 2000 Control Delay	36.9	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	1.03			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.6	
Intersection Capacity Utilization	98.5%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
34: Bel Marin Keys Blvd & Commercial Blvd

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	12	77	0	9	48	1395	242	13	484	1
Future Volume (vph)	0	0	12	77	0	9	48	1395	242	13	484	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	3.0	3.9		3.0	3.5	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.86			1.00	0.85	1.00	0.98		1.00	1.00	
Flt Protected		1.00			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1620			1766	1395	1805	3447		1805	3538	
Flt Permitted		1.00			0.75	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1620			1392	1395	1805	3447		1805	3538	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	13	81	0	9	51	1468	255	14	509	1
RTOR Reduction (vph)	0	11	0	0	0	8	0	7	0	0	0	0
Lane Group Flow (vph)	0	2	0	0	81	1	51	1716	0	14	510	0
Confl. Peds. (#/hr)	3		2	2		3			3			
Heavy Vehicles (%)	2%	0%	0%	2%	0%	14%	0%	2%	2%	0%	2%	0%
Turn Type		NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		12.3			12.3	12.3	6.8	75.0		1.8	70.4	
Effective Green, g (s)		12.3			12.3	12.3	6.8	75.0		1.8	70.4	
Actuated g/C Ratio		0.12			0.12	0.12	0.07	0.75		0.02	0.70	
Clearance Time (s)		4.0			4.0	4.0	3.0	3.9		3.0	3.5	
Vehicle Extension (s)		3.0			3.0	3.0	2.5	3.0		2.5	4.0	
Lane Grp Cap (vph)		199			171	171	122	2585		32	2490	
v/s Ratio Prot		0.00					c0.03	c0.50		0.01	0.14	
v/s Ratio Perm					c0.06	0.00						
v/c Ratio		0.01			0.47	0.01	0.42	0.66		0.44	0.20	
Uniform Delay, d1		38.5			40.8	38.5	44.7	6.2		48.6	5.1	
Progression Factor		1.00			1.00	1.00	0.96	0.69		0.93	1.27	
Incremental Delay, d2		0.0			2.1	0.0	0.6	0.5		6.8	0.2	
Delay (s)		38.5			42.9	38.5	43.5	4.8		51.8	6.7	
Level of Service		D			D	D	D	A		D	A	
Approach Delay (s)		38.5			42.5			6.0			7.9	
Approach LOS		D			D			A			A	

Intersection Summary				
HCM 2000 Control Delay	7.9	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.64			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.9	
Intersection Capacity Utilization	69.2%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
35: Bel Marin Keys Blvd & Hamilton Dr/Digital Dr 02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1	48	102	2	9	109	690	618	9	353	3
Future Volume (vph)	0	1	48	102	2	9	109	690	618	9	353	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	3.5	3.5	3.5		3.0	4.0		3.0	4.0	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.99	1.00	0.99		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	0.85	1.00	0.88		1.00	0.93		1.00	1.00	
Flt Protected		1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1900	1533	1768	1649		1770	3251		1805	3534	
Flt Permitted		1.00	1.00	0.76	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1900	1533	1409	1649		1770	3251		1805	3534	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1	51	107	2	9	115	726	651	9	372	3
RTOR Reduction (vph)	0	0	43	0	8	0	0	85	0	0	0	0
Lane Group Flow (vph)	0	1	8	107	3	0	115	1292	0	9	375	0
Confl. Peds. (#/hr)	1		1	1		1			2			8
Heavy Vehicles (%)	0%	0%	4%	2%	0%	0%	2%	2%	2%	0%	2%	0%
Turn Type		NA	Perm	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8								
Actuated Green, G (s)		15.1	15.1	15.1	15.1		11.5	72.6		1.8	62.9	
Effective Green, g (s)		15.1	15.1	15.1	15.1		11.5	72.6		1.8	62.9	
Actuated g/C Ratio		0.15	0.15	0.15	0.15		0.12	0.73		0.02	0.63	
Clearance Time (s)		3.5	3.5	3.5	3.5		3.0	4.0		3.0	4.0	
Vehicle Extension (s)		2.0	2.0	2.5	2.5		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)		286	231	212	248		203	2360		32	2222	
v/s Ratio Prot		0.00			0.00		c0.06	c0.40		0.00	0.11	
v/s Ratio Perm			0.01	c0.08								
v/c Ratio		0.00	0.03	0.50	0.01		0.57	0.55		0.28	0.17	
Uniform Delay, d1		36.1	36.2	39.0	36.1		41.9	6.2		48.5	7.7	
Progression Factor		1.00	1.00	1.00	1.00		1.05	1.29		1.00	1.00	
Incremental Delay, d2		0.0	0.0	1.4	0.0		1.7	0.7		1.8	0.2	
Delay (s)		36.1	36.2	40.4	36.1		45.6	8.8		50.2	7.9	
Level of Service		D	D	D	D		D	A		D	A	
Approach Delay (s)		36.2			40.0			11.6			8.9	
Approach LOS		D			D			B			A	

Intersection Summary				
HCM 2000 Control Delay	13.4	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.56			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.5	
Intersection Capacity Utilization	69.1%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
35: Bel Marin Keys Blvd #3 & Hamilton Dr/Digital Dr 02/23/2018

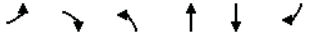
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1	48	102	2	9	109	690	618	9	353	3
Future Volume (vph)	0	1	48	102	2	9	109	690	618	9	353	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	3.5	3.5	3.5		3.0	4.5		3.0	4.5	
Lane Util. Factor		1.00	1.00	0.95	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.99	1.00	1.00		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	0.85	1.00	0.98		1.00	0.93		1.00	1.00	
Flt Protected		1.00	1.00	0.95	0.96		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1900	1533	1715	1691		1770	3316		1805	3569	
Flt Permitted		1.00	1.00	0.95	0.96		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1900	1533	1715	1691		1770	3316		1805	3569	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1	51	107	2	9	115	726	651	9	372	3
RTOR Reduction (vph)	0	0	46	0	8	0	0	81	0	0	1	0
Lane Group Flow (vph)	0	1	5	60	50	0	115	1296	0	9	374	0
Confl. Peds. (#/hr)	1		1	1		1			2			8
Heavy Vehicles (%)	0%	0%	4%	0%	0%	0%	2%	0%	0%	0%	1%	0%
Turn Type		NA	Perm	Split	NA		Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)		10.0	10.0	11.0	11.0		15.4	63.7		0.8	49.1	
Effective Green, g (s)		10.0	10.0	11.0	11.0		15.4	63.7		0.8	49.1	
Actuated g/C Ratio		0.10	0.10	0.11	0.11		0.15	0.64		0.01	0.49	
Clearance Time (s)		3.5	3.5	3.5	3.5		3.0	4.5		3.0	4.5	
Vehicle Extension (s)		2.0	2.0	2.5	2.5		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)		190	153	188	186		272	2112		14	1752	
v/s Ratio Prot		0.00		c0.03	0.03		0.06	c0.39		c0.00	0.10	
v/s Ratio Perm			c0.00									
v/c Ratio		0.01	0.03	0.32	0.27		0.42	0.61		0.64	0.21	
Uniform Delay, d1		40.5	40.6	41.0	40.8		38.3	10.8		49.5	14.5	
Progression Factor		1.00	1.00	1.00	1.00		0.78	0.36		1.00	1.00	
Incremental Delay, d2		0.0	0.0	0.7	0.6		0.3	1.1		56.8	0.3	
Delay (s)		40.5	40.7	41.8	41.4		30.2	4.9		106.2	14.8	
Level of Service		D	D	D	D		C	A		F	B	
Approach Delay (s)		40.7			41.6			6.9			16.9	
Approach LOS		D			D			A			B	

Intersection Summary				
HCM 2000 Control Delay	11.6	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.51			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.5	
Intersection Capacity Utilization	63.0%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
36: Nave Dr & US 101 NB Off Ramp

02/15/2018



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	786	174	0	893	1203	195
Future Volume (vph)	786	174	0	893	1203	195
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		5.0	5.0	
Lane Util. Factor	0.97	1.00		0.95	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	0.98	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3467	1563		3574	3504	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3467	1563		3574	3504	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	854	189	0	971	1308	212
RTOR Reduction (vph)	0	20	0	0	19	0
Lane Group Flow (vph)	854	169	0	971	1502	0
Confl. Peds. (#/hr)		1				
Heavy Vehicles (%)	1%	2%	0%	1%	1%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	27.0	27.0		35.0	35.0	
Effective Green, g (s)	27.0	27.0		35.0	35.0	
Actuated g/C Ratio	0.39	0.39		0.50	0.50	
Clearance Time (s)	3.0	3.0		5.0	5.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	1337	602		1787	1752	
v/s Ratio Prot	c0.25			0.27	c0.43	
v/s Ratio Perm		0.11				
v/c Ratio	0.64	0.28		0.54	0.86	
Uniform Delay, d1	17.5	14.8		12.0	15.3	
Progression Factor	1.00	1.00		0.37	1.00	
Incremental Delay, d2	2.3	1.2		1.0	5.7	
Delay (s)	19.9	16.0		5.5	21.0	
Level of Service	B	B		A	C	
Approach Delay (s)	19.2			5.5	21.0	
Approach LOS	B			A	C	

Intersection Summary				
HCM 2000 Control Delay	16.2	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.76			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	69.5%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
37: Nave Dr & Hamilton Center

02/15/2018

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	40	21	730	86	102	1128
Future Volume (vph)	40	21	730	86	102	1128
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.2	3.2	4.4		3.0	4.4
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	1615	1868		1770	1881
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1805	1615	1868		1770	1881
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	23	793	93	111	1226
RTOR Reduction (vph)	0	22	5	0	0	0
Lane Group Flow (vph)	43	1	881	0	111	1226
Confl. Peds. (#/hr)				2		
Heavy Vehicles (%)	0%	0%	0%	0%	2%	1%
Turn Type	Prot	Perm	NA		Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8				
Actuated Green, G (s)	3.6	3.6	48.6		7.2	58.8
Effective Green, g (s)	3.6	3.6	48.6		7.2	58.8
Actuated g/C Ratio	0.05	0.05	0.69		0.10	0.84
Clearance Time (s)	3.2	3.2	4.4		3.0	4.4
Vehicle Extension (s)	1.0	1.0	1.0		1.0	1.0
Lane Grp Cap (vph)	92	83	1296		182	1580
v/s Ratio Prot	c0.02		0.47		0.06	c0.65
v/s Ratio Perm		0.00				
v/c Ratio	0.47	0.01	0.68		0.61	0.78
Uniform Delay, d1	32.3	31.5	6.2		30.1	2.6
Progression Factor	1.00	1.00	0.76		1.29	1.55
Incremental Delay, d2	1.4	0.0	2.3		2.3	2.3
Delay (s)	33.6	31.5	7.0		41.0	6.3
Level of Service	C	C	A		D	A
Approach Delay (s)	32.9		7.0			9.1
Approach LOS	C		A			A

Intersection Summary				
HCM 2000 Control Delay	9.0	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.80			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	10.6	
Intersection Capacity Utilization	71.4%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
38: Nave Dr & Hamilton Pkwy

02/15/2018

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	119	283	498	42	360	773
Future Volume (vph)	119	283	498	42	360	773
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.2	3.2	4.4	4.4	3.0	4.4
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1599	1900	1578	1787	1850
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1599	1900	1578	1787	1900
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	129	308	541	46	391	840
RTOR Reduction (vph)	0	266	0	13	0	0
Lane Group Flow (vph)	129	42	541	33	391	840
Confl. Peds. (#/hr)				2		
Heavy Vehicles (%)	2%	1%	0%	0%	1%	0%
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Actuated Green, G (s)	9.6	9.6	25.4	25.4	24.4	52.8
Effective Green, g (s)	9.6	9.6	25.4	25.4	24.4	52.8
Actuated g/C Ratio	0.14	0.14	0.36	0.36	0.35	0.75
Clearance Time (s)	3.2	3.2	4.4	4.4	3.0	4.4
Vehicle Extension (s)	2.0	2.0	3.0	3.0	2.0	3.0
Lane Grp Cap (vph)	242	219	689	572	622	1395
v/s Ratio Prot	c0.07		c0.28		c0.22	0.45
v/s Ratio Perm		0.03		0.02		
v/c Ratio	0.53	0.19	0.79	0.06	0.63	0.60
Uniform Delay, d1	28.1	26.8	19.9	14.5	19.0	3.9
Progression Factor	1.00	1.00	1.00	1.00	1.25	0.67
Incremental Delay, d2	1.1	0.2	8.8	0.2	1.0	1.3
Delay (s)	29.2	26.9	28.6	14.7	24.7	3.9
Level of Service	C	C	C	B	C	A
Approach Delay (s)	27.6		27.5			10.5
Approach LOS	C		C			B

Intersection Summary				
HCM 2000 Control Delay	18.3	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.68			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	10.6	
Intersection Capacity Utilization	63.1%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
39: Nave Dr & Main Gate Dr

02/15/2018

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	264	185	231	460	301	337
Future Volume (vph)	264	185	231	460	301	337
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	4.1	4.1	3.0	4.4
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1805	1615	1900	1615	1805	1881
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1805	1615	1900	1615	1805	1881
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	284	199	248	495	324	362
RTOR Reduction (vph)	0	149	0	369	0	0
Lane Group Flow (vph)	284	50	248	126	324	362
Heavy Vehicles (%)	0%	0%	0%	0%	0%	1%
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Actuated Green, G (s)	11.4	11.4	11.5	11.5	12.2	26.4
Effective Green, g (s)	11.4	11.4	11.5	11.5	12.2	26.4
Actuated g/C Ratio	0.25	0.25	0.25	0.25	0.27	0.58
Clearance Time (s)	3.0	3.0	4.1	4.1	3.0	4.4
Vehicle Extension (s)	2.0	2.0	1.0	1.0	1.0	1.0
Lane Grp Cap (vph)	455	407	483	410	487	1098
v/s Ratio Prot	c0.16		c0.13		c0.18	0.19
v/s Ratio Perm		0.03		0.08		
v/c Ratio	0.62	0.12	0.51	0.31	0.67	0.33
Uniform Delay, d1	15.0	13.0	14.5	13.6	14.7	4.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.9	0.0	0.4	0.2	2.7	0.1
Delay (s)	16.9	13.1	14.8	13.8	17.3	4.9
Level of Service	B	B	B	B	B	A
Approach Delay (s)	15.3		14.1			10.8
Approach LOS	B		B			B

Intersection Summary				
HCM 2000 Control Delay	13.2	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.60			
Actuated Cycle Length (s)	45.2	Sum of lost time (s)	10.1	
Intersection Capacity Utilization	53.5%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
40: Nave Dr & Bolling Dr

02/15/2018

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	338	110	523	98	83	532
Future Volume (vph)	338	110	523	98	83	532
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	4.1		3.0	3.5
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	0.97	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.98		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1787	1571	1844		1805	1881
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1787	1571	1844		1805	1881
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	367	120	568	107	90	578
RTOR Reduction (vph)	0	85	9	0	0	0
Lane Group Flow (vph)	367	35	666	0	90	578
Confl. Peds. (#/hr)		6				
Heavy Vehicles (%)	1%	0%	1%	0%	0%	1%
Turn Type	Prot	Perm	NA		Prot	NA
Protected Phases	4		6		5	2
Permitted Phases		4				
Actuated Green, G (s)	17.5	17.5	25.5		6.5	35.6
Effective Green, g (s)	17.5	17.5	25.5		6.5	35.6
Actuated g/C Ratio	0.29	0.29	0.43		0.11	0.60
Clearance Time (s)	3.0	3.0	4.1		3.0	3.5
Vehicle Extension (s)	2.0	2.0	2.0		2.0	2.0
Lane Grp Cap (vph)	524	461	788		196	1123
v/s Ratio Prot	c0.21		c0.36		0.05	c0.31
v/s Ratio Perm		0.02				
v/c Ratio	0.70	0.08	0.84		0.46	0.51
Uniform Delay, d1	18.7	15.2	15.3		24.9	7.0
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	3.4	0.0	8.0		0.6	0.2
Delay (s)	22.2	15.2	23.2		25.5	7.1
Level of Service	C	B	C		C	A
Approach Delay (s)	20.5		23.2			9.6
Approach LOS	C		C			A

Intersection Summary				
HCM 2000 Control Delay	17.5	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.75			
Actuated Cycle Length (s)	59.6	Sum of lost time (s)	10.1	
Intersection Capacity Utilization	70.0%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM 2010 AWSC
41: Alameda Del Prado & Clay Ct/Nave Dr

02/15/2018

Intersection	
Intersection Delay, s/veh	33.9
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	131	12	0	66	123	620	2	164	45	109	21	6
Future Vol, veh/h	131	12	0	66	123	620	2	164	45	109	21	6
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	138	13	0	69	129	653	2	173	47	115	22	6
Number of Lanes	0	1	0	0	1	1	0	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	2	1
HCM Control Delay	13.7	45.6	16.1	13.2
HCM LOS	B	E	C	B

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	1%	92%	35%	0%	100%	0%
Vol Thru, %	78%	8%	65%	0%	0%	78%
Vol Right, %	21%	0%	0%	100%	0%	22%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	211	143	189	620	109	27
LT Vol	2	131	66	0	109	0
Through Vol	164	12	123	0	0	21
RT Vol	45	0	0	620	0	6
Lane Flow Rate	222	151	199	653	115	28
Geometry Grp	6	6	7	7	7	7
Degree of Util (X)	0.449	0.309	0.35	0.989	0.262	0.059
Departure Headway (Hd)	7.278	7.381	6.445	5.557	8.207	7.534
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	498	488	561	659	439	477
Service Time	5.278	5.408	4.145	3.257	5.925	5.251
HCM Lane V/C Ratio	0.446	0.309	0.355	0.991	0.262	0.059
HCM Control Delay	16.1	13.7	12.6	55.6	13.8	10.7
HCM Lane LOS	C	B	B	F	B	B
HCM 95th-tile Q	2.3	1.3	1.6	15.1	1	0.2

Intersection	
Intersection Delay, s/veh	131.2
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	12	482	96	342	1012	32	112	16	169	19	12	13
Future Vol, veh/h	12	482	96	342	1012	32	112	16	169	19	12	13
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	13	507	101	360	1065	34	118	17	178	20	13	14
Number of Lanes	1	2	0	1	2	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	3	3
HCM Control Delay	47.9	192.9	25.6	18
HCM LOS	E	F	D	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1
Vol Left, %	88%	0%	100%	0%	0%	100%	0%	0%	43%
Vol Thru, %	12%	0%	0%	100%	63%	0%	100%	91%	27%
Vol Right, %	0%	100%	0%	0%	37%	0%	0%	9%	30%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	128	169	12	321	257	342	675	369	44
LT Vol	112	0	12	0	0	342	0	0	19
Through Vol	16	0	0	321	161	0	675	337	12
RT Vol	0	169	0	0	96	0	0	32	13
Lane Flow Rate	135	178	13	338	270	360	710	389	46
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.431	0.514	0.035	0.902	0.701	0.905	1.683	0.914	0.154
Departure Headway (Hd)	12.819	11.656	11.097	10.58	10.309	9.046	8.529	8.466	12.996
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	283	311	325	345	354	400	426	428	278
Service Time	10.519	9.356	8.797	8.28	8.009	6.824	6.307	6.244	10.696
HCM Lane V/C Ratio	0.477	0.572	0.04	0.98	0.763	0.9	1.667	0.909	0.165
HCM Control Delay	24.9	26.1	14.2	60.4	33.9	55	338.6	54.3	18
HCM Lane LOS	C	D	B	F	D	F	F	F	C
HCM 95th-tile Q	2.1	2.8	0.1	8.8	5.1	9.5	42	10	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	482	96	342	1012	32	112	16	169	19	12	13
Future Volume (vph)	12	482	96	342	1012	32	112	16	169	19	12	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.98	
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583		1785	1583		1751	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.75	1.00		0.86	
Satd. Flow (perm)	1770	1863	1583	1770	1863	1583		1401	1583		1540	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	13	507	101	360	1065	34	118	17	178	20	13	14
RTOR Reduction (vph)	0	0	58	0	0	11	0	0	85	0	12	0
Lane Group Flow (vph)	13	507	43	360	1065	23	0	135	93	0	35	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	pm+ov	Perm	NA	
Protected Phases	7	4		3	8			2	3		6	
Permitted Phases			4			8	2		2	6		
Actuated Green, G (s)	0.7	33.2	33.2	19.2	51.7	51.7		13.6	32.8		13.6	
Effective Green, g (s)	0.7	33.2	33.2	19.2	51.7	51.7		13.6	32.8		13.6	
Actuated g/C Ratio	0.01	0.43	0.43	0.25	0.66	0.66		0.17	0.42		0.17	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	
Lane Grp Cap (vph)	15	792	673	435	1234	1049		244	746		268	
v/s Ratio Prot	0.01	0.27		c0.20	c0.57				0.03			
v/s Ratio Perm			0.03			0.01		c0.10	0.03		0.02	
v/c Ratio	0.87	0.64	0.06	0.83	0.86	0.02		0.55	0.12		0.13	
Uniform Delay, d1	38.6	17.7	13.2	27.8	10.4	4.5		29.4	13.8		27.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2	162.9	1.8	0.0	12.2	6.5	0.0		2.7	0.1		0.2	
Delay (s)	201.5	19.5	13.3	40.1	16.8	4.5		32.1	13.9		27.4	
Level of Service	F	B	B	D	B	A		C	B		C	
Approach Delay (s)		22.3			22.3			21.8			27.4	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	22.3	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	78.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	79.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

MOVEMENT SUMMARY

Site: 1 [PM Cumulative]

Simmons Lane/San Marin Drive
PM Cumulative with Project

Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NB Simmons Ln											
3	L2	117	2.0	0.399	9.7	LOS A	2.2	54.6	0.67	0.70	31.6
8	T1	17	2.0	0.399	9.7	LOS A	2.2	54.6	0.67	0.70	31.6
18	R2	176	2.0	0.399	9.7	LOS A	2.2	54.6	0.67	0.70	30.8
Approach		309	2.0	0.399	9.7	LOS A	2.2	54.6	0.67	0.70	31.2
East: WB San Marin Drive											
1	L2	356	2.0	0.293	5.6	LOS A	1.5	36.9	0.33	0.20	32.1
6	T1	1054	2.0	1.011	49.6	LOS F	72.4	1838.6	1.00	1.69	20.7
16	R2	33	2.0	1.011	49.6	LOS F	72.4	1838.6	1.00	1.69	20.3
Approach		1444	2.0	1.011	38.8	LOS D	72.4	1838.6	0.84	1.32	22.7
North: SB Simmons Ln											
7	L2	20	2.0	0.122	11.6	LOS B	0.4	9.8	0.76	0.76	30.7
4	T1	13	2.0	0.122	11.6	LOS B	0.4	9.8	0.76	0.76	30.7
14	R2	14	2.0	0.122	11.6	LOS B	0.4	9.8	0.76	0.76	30.0
Approach		46	2.0	0.122	11.6	LOS B	0.4	9.8	0.76	0.76	30.5
West: EB San Marin Drive											
5	L2	13	2.0	0.681	15.4	LOS B	8.8	222.3	0.81	1.02	30.1
2	T1	502	2.0	0.681	15.4	LOS B	8.8	222.3	0.81	1.02	30.1
12	R2	100	2.0	0.681	15.4	LOS B	8.8	222.3	0.81	1.02	29.3
Approach		615	2.0	0.681	15.4	LOS B	8.8	222.3	0.81	1.02	29.9
All Vehicles		2414	2.0	1.011	28.6	LOS C	72.4	1838.6	0.81	1.15	25.2

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Organisation: W-TRANS | Processed: Tuesday, February 27, 2018 3:51:48 PM
Project: N:\AAA\MAX\NOV\126NOV\SIDRA\Simmons-San Marin.sip7

HCM Signalized Intersection Capacity Analysis
2: W Campus Dr & San Marin Dr 02/15/2018

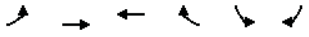
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	708	0	3	1384	45	0	0	0	207	0	36
Future Volume (vph)	8	708	0	3	1384	45	0	0	0	207	0	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.8		4.0	4.8	4.8				4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00				0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00				1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00				1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85				1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00				0.95	0.95	1.00
Satd. Flow (prot)	1805	3574		1805	3574	1615				1715	1715	1615
Flt Permitted	0.95	1.00		0.95	1.00	1.00				0.76	0.76	1.00
Satd. Flow (perm)	1805	3574		1805	3574	1615				1367	1367	1615
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	8	745	0	3	1457	47	0	0	0	218	0	38
RTOR Reduction (vph)	0	0	0	0	0	18	0	0	0	0	0	33
Lane Group Flow (vph)	8	745	0	3	1457	29	0	0	0	109	109	5
Confl. Peds. (#/hr)			2									
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA	Perm				Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8			4		4
Actuated Green, G (s)	1.5	36.7		1.3	36.5	36.5				8.4	8.4	8.4
Effective Green, g (s)	1.5	36.7		1.3	36.5	36.5				8.4	8.4	8.4
Actuated g/C Ratio	0.03	0.62		0.02	0.62	0.62				0.14	0.14	0.14
Clearance Time (s)	4.0	4.8		4.0	4.8	4.8				4.0	4.0	4.0
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0				2.0	2.0	2.0
Lane Grp Cap (vph)	45	2215		39	2203	995				193	193	229
v/s Ratio Prot	c0.00	0.21		0.00	c0.41							
v/s Ratio Perm						0.02				c0.08	0.08	0.00
v/c Ratio	0.18	0.34		0.08	0.66	0.03				0.56	0.56	0.02
Uniform Delay, d1	28.2	5.4		28.4	7.3	4.4				23.7	23.7	21.9
Progression Factor	1.00	1.00		1.00	1.00	1.00				1.00	1.00	1.00
Incremental Delay, d2	0.7	0.1		0.3	0.8	0.0				2.2	2.2	0.0
Delay (s)	28.9	5.5		28.7	8.2	4.4				25.9	25.9	21.9
Level of Service	C	A		C	A	A				C	C	C
Approach Delay (s)		5.8			8.1			0.0			25.3	
Approach LOS		A			A			A			C	

Intersection Summary			
HCM 2000 Control Delay	9.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	59.2	Sum of lost time (s)	12.8
Intersection Capacity Utilization	53.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: San Marin Dr & E Campus Drive

02/15/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	3	919	1427	136	493	12
Future Volume (vph)	3	919	1427	136	493	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.3	4.3	4.3	3.0	3.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1805	3574	3574	1615	3502	1595
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1805	3574	3574	1615	3502	1595
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	3	957	1486	142	514	12
RTOR Reduction (vph)	0	0	0	53	0	10
Lane Group Flow (vph)	3	957	1486	89	514	3
Confl. Peds. (#/hr)						1
Heavy Vehicles (%)	0%	1%	1%	0%	0%	0%
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Actuated Green, G (s)	1.3	48.8	44.5	44.5	18.2	18.2
Effective Green, g (s)	1.3	48.8	44.5	44.5	18.2	18.2
Actuated g/C Ratio	0.02	0.66	0.60	0.60	0.24	0.24
Clearance Time (s)	3.0	4.3	4.3	4.3	3.0	3.0
Vehicle Extension (s)	2.0	4.0	4.0	4.0	2.0	2.0
Lane Grp Cap (vph)	31	2347	2140	967	857	390
v/s Ratio Prot	0.00	c0.27	c0.42		c0.15	
v/s Ratio Perm				0.06		0.00
v/c Ratio	0.10	0.41	0.69	0.09	0.60	0.01
Uniform Delay, d1	35.9	6.0	10.2	6.3	24.8	21.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	0.2	1.1	0.1	0.8	0.0
Delay (s)	36.4	6.1	11.3	6.4	25.6	21.2
Level of Service	D	A	B	A	C	C
Approach Delay (s)		6.2	10.9		25.5	
Approach LOS		A	B		C	

Intersection Summary				
HCM 2000 Control Delay	11.9	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.66			
Actuated Cycle Length (s)	74.3	Sum of lost time (s)	10.3	
Intersection Capacity Utilization	60.8%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
4: Redwood Blvd & San Marin Dr

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	1168	229	417	1113	235	302	100	562	731	165	107
Future Volume (vph)	36	1168	229	417	1113	235	302	100	562	731	165	107
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.6		3.0	4.0		4.3	4.3	4.3	4.3	4.3	
Lane Util. Factor	1.00	0.91		1.00	0.91		0.97	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	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	1.00	
Frt	1.00	0.98		1.00	0.97		1.00	1.00	0.85	1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1787	4997		1752	5002		3467	1881	1568	1787	1758	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1787	4997		1752	5002		3467	1881	1568	1787	1758	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	38	1229	241	439	1172	247	318	105	592	769	174	113
RTOR Reduction (vph)	0	22	0	0	24	0	0	0	177	0	18	0
Lane Group Flow (vph)	38	1448	0	439	1395	0	318	105	415	769	269	0
Confl. Peds. (#/hr)			4									5
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	1%	1%	1%	3%	1%	1%	1%	1%	3%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA		Split	NA	Perm	Split	NA	
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases					2				7			
Actuated Green, G (s)	8.0	44.1		14.8	50.5		12.2	12.2	12.2	43.7	43.7	
Effective Green, g (s)	8.0	44.1		14.8	50.5		12.2	12.2	12.2	43.7	43.7	
Actuated g/C Ratio	0.06	0.34		0.11	0.39		0.09	0.09	0.09	0.34	0.34	
Clearance Time (s)	3.0	3.6		3.0	4.0		4.3	4.3	4.3	4.3	4.3	
Vehicle Extension (s)	2.0	4.0		5.0	4.0		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	109	1695		199	1943		325	176	147	600	590	
v/s Ratio Prot	0.02	c0.29		c0.25	0.28		0.09	0.06		c0.43	0.15	
v/s Ratio Perm									c0.26			
v/c Ratio	0.35	0.85		2.21	0.72		0.98	0.60	2.83	1.28	0.46	
Uniform Delay, d1	58.5	40.0		57.6	33.7		58.8	56.5	58.9	43.1	33.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.7	4.6		558.8	2.3		43.4	3.6	839.9	139.2	0.2	
Delay (s)	59.2	44.5		616.4	36.0		102.2	60.1	898.8	182.3	34.0	
Level of Service	E	D		F	D		F	E	F	F	C	
Approach Delay (s)		44.9			173.1			562.4			142.0	
Approach LOS		D			F			F			F	

Intersection Summary				
HCM 2000 Control Delay	204.2	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	1.40			
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	15.6	
Intersection Capacity Utilization	114.7%	ICU Level of Service	H	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
4: Redwood Blvd & San Marin Dr

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	1168	229	417	1113	235	302	100	562	731	165	107
Future Volume (vph)	36	1168	229	417	1113	235	302	100	562	731	165	107
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.6		3.0	4.0	4.3	4.3	4.3	3.0	4.3	4.3	
Lane Util. Factor	1.00	0.91		0.97	0.95	1.00	0.95	0.95	0.88	0.91	0.91	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	0.98	1.00	0.95	0.97	
Satd. Flow (prot)	1787	4996		3400	3574	1599	1698	1743	2760	1626	3235	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	0.98	1.00	0.95	0.97	
Satd. Flow (perm)	1787	4996		3400	3574	1599	1698	1743	2760	1626	3235	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	38	1229	241	439	1172	247	318	105	592	769	174	113
RTOR Reduction (vph)	0	21	0	0	0	77	0	0	49	0	12	0
Lane Group Flow (vph)	38	1449	0	439	1172	170	210	213	543	384	660	0
Confl. Peds. (#/hr)			4									5
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	1%	1%	1%	3%	1%	1%	1%	1%	3%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA	pm+ov	Split	NA	
Protected Phases	5	2		1	6	4	8	8	1	4	4	
Permitted Phases						6			8			
Actuated Green, G (s)	8.0	46.6		20.6	58.8	96.3	20.1	20.1	40.7	37.5	37.5	
Effective Green, g (s)	8.0	46.6		20.6	58.8	96.3	20.1	20.1	40.7	37.5	37.5	
Actuated g/C Ratio	0.06	0.33		0.15	0.42	0.69	0.14	0.14	0.29	0.27	0.27	
Clearance Time (s)	3.0	3.6		3.0	4.0	4.3	4.3	4.3	3.0	4.3	4.3	
Vehicle Extension (s)	2.0	4.0		5.0	4.0	2.0	2.0	2.0	5.0	2.0	2.0	
Lane Grp Cap (vph)	102	1662		500	1501	1099	243	250	802	435	866	
v/s Ratio Prot	0.02	c0.29		c0.13	0.33	0.04	c0.12	0.12	0.10	c0.24	0.20	
v/s Ratio Perm						0.06			0.10			
v/c Ratio	0.37	0.87		0.88	0.78	0.15	0.86	0.85	0.68	0.88	0.76	
Uniform Delay, d1	63.6	43.9		58.5	35.0	7.6	58.6	58.5	43.8	49.1	47.2	
Progression Factor	1.00	1.00		0.83	0.57	3.40	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.8	6.6		14.5	3.4	0.0	25.0	22.6	3.0	18.2	3.6	
Delay (s)	64.4	50.5		62.9	23.5	25.9	83.6	81.1	46.8	67.3	50.8	
Level of Service	E	D		E	C	C	F	F	D	E	D	
Approach Delay (s)		50.9			33.1			61.6			56.8	
Approach LOS		D			C			E			E	

Intersection Summary				
HCM 2000 Control Delay	48.0	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.88			
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.6	
Intersection Capacity Utilization	96.0%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
5: US 101 SB Ramps & San Marin Dr

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1302	1123	200	1433	0	0	0	0	67	2	386
Future Volume (vph)	0	1302	1123	200	1433	0	0	0	0	67	2	386
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9	4.9	3.0	5.3						4.0	4.0
Lane Util. Factor		0.95	1.00	1.00	0.95						1.00	0.88
Frpb, ped/bikes		1.00	0.98	1.00	1.00						1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		3574	1575	1805	3574						1812	2814
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		3574	1575	1805	3574						1812	2814
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	1342	1158	206	1477	0	0	0	0	69	2	398
RTOR Reduction (vph)	0	0	264	0	0	0	0	0	0	0	0	125
Lane Group Flow (vph)	0	1342	894	206	1477	0	0	0	0	0	71	273
Confl. Peds. (#/hr)			4									
Heavy Vehicles (%)	0%	1%	1%	0%	1%	0%	0%	0%	0%	0%	0%	1%
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			2									4
Actuated Green, G (s)		41.1	41.1	9.0	52.7						8.0	8.0
Effective Green, g (s)		41.1	41.1	9.0	52.7						8.0	8.0
Actuated g/C Ratio		0.59	0.59	0.13	0.75						0.11	0.11
Clearance Time (s)		4.9	4.9	3.0	5.3						4.0	4.0
Vehicle Extension (s)		4.0	4.0	2.0	4.0						2.0	2.0
Lane Grp Cap (vph)		2098	924	232	2690						207	321
v/s Ratio Prot		0.38		c0.11	0.41						0.04	
v/s Ratio Perm			c0.57									c0.10
v/c Ratio		0.64	0.97	0.89	0.55						0.34	0.85
Uniform Delay, d1		9.6	13.8	30.0	3.6						28.6	30.4
Progression Factor		1.00	1.00	1.00	1.00						1.00	1.00
Incremental Delay, d2		1.5	22.7	30.2	0.8						0.4	18.3
Delay (s)		11.1	36.5	60.2	4.5						28.9	48.8
Level of Service		B	D	E	A						C	D
Approach Delay (s)		22.8			11.3			0.0			45.8	
Approach LOS		C			B			A			D	

Intersection Summary				
HCM 2000 Control Delay	21.0	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.94			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	11.9	
Intersection Capacity Utilization	144.4%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
5: US 101 SB Ramps & San Marin Dr

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1302	1123	200	1433	0	0	0	0	67	2	386
Future Volume (vph)	0	1302	1123	200	1433	0	0	0	0	67	2	386
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9	4.9	3.0	5.3						4.0	4.0
Lane Util. Factor		0.91	0.91	1.00	0.95						1.00	0.88
Frpb, ped/bikes		1.00	1.00	1.00	1.00						1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00						1.00	1.00
Frt		0.97	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		3297	1455	1805	3574						1812	2814
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		3297	1455	1805	3574						1812	2814
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	1342	1158	206	1477	0	0	0	0	69	2	398
RTOR Reduction (vph)	0	15	229	0	0	0	0	0	0	0	0	167
Lane Group Flow (vph)	0	1721	535	206	1477	0	0	0	0	0	71	231
Confl. Peds. (#/hr)			4									
Heavy Vehicles (%)	0%	1%	1%	0%	1%	0%	0%	0%	0%	0%	0%	1%
Turn Type		NA	Prot	Prot	NA					Split	NA	Perm
Protected Phases		2	2	1	6					4	4	
Permitted Phases												4
Actuated Green, G (s)		92.0	92.0	17.4	117.4						13.3	13.3
Effective Green, g (s)		92.0	92.0	17.4	117.4						13.3	13.3
Actuated g/C Ratio		0.66	0.66	0.12	0.84						0.10	0.10
Clearance Time (s)		4.9	4.9	3.0	5.3						4.0	4.0
Vehicle Extension (s)		4.0	4.0	2.0	4.0						2.0	2.0
Lane Grp Cap (vph)		2166	956	224	2997						172	267
v/s Ratio Prot		c0.52	0.37	c0.11	c0.41						0.04	
v/s Ratio Perm												c0.08
v/c Ratio		0.79	0.56	0.92	0.49						0.41	0.87
Uniform Delay, d1		17.2	13.0	60.6	3.1						59.7	62.5
Progression Factor		0.80	0.87	0.95	2.27						1.00	1.00
Incremental Delay, d2		1.9	1.5	28.9	0.4						0.6	23.6
Delay (s)		15.6	12.8	86.3	7.4						60.3	86.1
Level of Service		B	B	F	A						E	F
Approach Delay (s)		14.8			17.1			0.0			82.1	
Approach LOS		B			B			A			F	

Intersection Summary				
HCM 2000 Control Delay	22.4	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.81			
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	14.9	
Intersection Capacity Utilization	112.3%	ICU Level of Service	H	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
6: US 101 NB Ramps & San Marin Dr

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	629	690	0	0	569	63	1163	113	269	0	0	0
Future Volume (vph)	629	690	0	0	569	63	1163	113	269	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.6			4.9	4.9	3.5	3.5				
Lane Util. Factor	0.97	1.00			0.95	1.00	0.95	0.95				
Frpb, ped/bikes	1.00	1.00			1.00	0.99	1.00	0.99				
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00				
Frt	1.00	1.00			1.00	0.85	1.00	0.95				
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.98				
Satd. Flow (prot)	3467	1881			3574	1593	1681	1622				
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.98				
Satd. Flow (perm)	3467	1881			3574	1593	1681	1622				
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)	655	719	0	0	593	66	1211	118	280	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	55	0	29	0	0	0	0
Lane Group Flow (vph)	655	719	0	0	593	11	823	757	0	0	0	0
Confl. Peds. (#/hr)			3			1			1	1		
Heavy Vehicles (%)	1%	1%	0%	0%	1%	0%	2%	0%	3%	0%	0%	0%
Turn Type	Prot	NA			NA	Perm	Split	NA				
Protected Phases	5	2			6		8	8				
Permitted Phases						6						
Actuated Green, G (s)	10.3	26.0			11.9	11.9	35.1	35.1				
Effective Green, g (s)	10.3	26.0			11.9	11.9	35.1	35.1				
Actuated g/C Ratio	0.15	0.38			0.17	0.17	0.51	0.51				
Clearance Time (s)	3.5	4.6			4.9	4.9	3.5	3.5				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	2.5	2.5				
Lane Grp Cap (vph)	516	706			614	273	852	822				
v/s Ratio Prot	c0.19	c0.38			0.17		c0.49	0.47				
v/s Ratio Perm						0.01						
v/c Ratio	1.27	1.02			0.97	0.04	0.97	0.92				
Uniform Delay, d1	29.5	21.6			28.4	23.9	16.5	15.8				
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00				
Incremental Delay, d2	135.9	38.6			27.8	0.1	22.6	15.6				
Delay (s)	165.3	60.2			56.3	24.0	39.1	31.3				
Level of Service	F	E			E	C	D	C				
Approach Delay (s)		110.3			53.0			35.3			0.0	
Approach LOS		F			D			D			A	

Intersection Summary				
HCM 2000 Control Delay	66.8	HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio	1.08			
Actuated Cycle Length (s)	69.2	Sum of lost time (s)	11.9	
Intersection Capacity Utilization	144.4%	ICU Level of Service	H	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
6: US 101 NB Ramps & San Marin Dr

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	629	690	0	0	569	63	1163	113	269	0	0	0
Future Volume (vph)	629	690	0	0	569	63	1163	113	269	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.6			4.9	4.9	3.5	3.5				
Lane Util. Factor	0.97	1.00			0.95	1.00	0.97	1.00				
Frpb, ped/bikes	1.00	1.00			1.00	0.99	1.00	0.99				
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00				
Frt	1.00	1.00			1.00	0.85	1.00	0.89				
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00				
Satd. Flow (prot)	3467	1881			3574	1593	3433	1640				
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00				
Satd. Flow (perm)	3467	1881			3574	1593	3433	1640				
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)	655	719	0	0	593	66	1211	118	280	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	39	0	56	0	0	0	0
Lane Group Flow (vph)	655	719	0	0	593	27	1211	342	0	0	0	0
Confl. Peds. (#/hr)			3			1			1	1		
Heavy Vehicles (%)	1%	1%	0%	0%	1%	0%	2%	0%	3%	0%	0%	0%
Turn Type	Prot	NA			NA	Perm	Split	NA				
Protected Phases	5	2			6		8	8				
Permitted Phases						6						
Actuated Green, G (s)	30.2	62.6			28.6	28.6	69.3	69.3				
Effective Green, g (s)	30.2	62.6			28.6	28.6	69.3	69.3				
Actuated g/C Ratio	0.22	0.45			0.20	0.20	0.49	0.49				
Clearance Time (s)	3.5	4.6			4.9	4.9	3.5	3.5				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	2.5	2.5				
Lane Grp Cap (vph)	747	841			730	325	1699	811				
v/s Ratio Prot	0.19	c0.38			0.17		c0.35	0.21				
v/s Ratio Perm						0.02						
v/c Ratio	0.88	0.85			0.81	0.08	0.71	0.42				
Uniform Delay, d1	53.1	34.6			53.1	45.1	27.6	22.6				
Progression Factor	0.72	0.55			1.00	1.00	1.00	1.00				
Incremental Delay, d2	7.3	5.8			7.2	0.2	2.6	1.6				
Delay (s)	45.5	24.8			60.4	45.2	30.2	24.2				
Level of Service	D	C			E	D	C	C				
Approach Delay (s)		34.6			58.8			28.7			0.0	
Approach LOS		C			E			C			A	

Intersection Summary				
HCM 2000 Control Delay	36.4	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.80			
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	11.9	
Intersection Capacity Utilization	112.3%	ICU Level of Service	H	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
7: Redwood Blvd & Olive St

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	166	74	37	189	107	112	77	835	216	137	539	157
Future Volume (vph)	166	74	37	189	107	112	77	835	216	137	539	157
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.1	5.1			5.1		4.0	3.9	3.9	4.0	3.9	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.95			0.96		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00			0.98		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1770			1753		1770	3539	1583	1770	3420	
Flt Permitted	0.95	1.00			0.98		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1770			1753		1770	3539	1583	1770	3420	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	175	78	39	199	113	118	81	879	227	144	567	165
RTOR Reduction (vph)	0	18	0	0	12	0	0	0	78	0	23	0
Lane Group Flow (vph)	175	99	0	0	418	0	81	879	149	144	709	0
Turn Type	Split	NA		Split	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	14.0	14.0			26.1		7.8	28.4	28.4	10.1	30.7	
Effective Green, g (s)	14.0	14.0			26.1		7.8	28.4	28.4	10.1	30.7	
Actuated g/C Ratio	0.14	0.14			0.27		0.08	0.29	0.29	0.10	0.32	
Clearance Time (s)	5.1	5.1			5.1		4.0	3.9	3.9	4.0	3.9	
Vehicle Extension (s)	1.0	1.0			1.0		1.0	1.0	1.0	1.0	1.0	
Lane Grp Cap (vph)	256	256			473		142	1039	464	184	1085	
v/s Ratio Prot	c0.10	0.06			c0.24		0.05	c0.25		c0.08	0.21	
v/s Ratio Perm									0.09			
v/c Ratio	0.68	0.39			0.88		0.57	0.85	0.32	0.78	0.65	
Uniform Delay, d1	39.2	37.5			33.9		42.8	32.1	26.6	42.2	28.4	
Progression Factor	1.00	1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	5.9	0.4			17.2		3.4	6.2	0.1	17.9	1.1	
Delay (s)	45.1	37.8			51.0		46.2	38.3	26.8	60.1	29.5	
Level of Service	D	D			D		D	D	C	E	C	
Approach Delay (s)		42.2			51.0			36.6			34.5	
Approach LOS		D			D			D			C	

Intersection Summary				
HCM 2000 Control Delay	38.8	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.81			
Actuated Cycle Length (s)	96.7	Sum of lost time (s)	18.1	
Intersection Capacity Utilization	71.9%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
8: Redwood Blvd & Grant Ave

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	141	142	330	49	178	88	420	661	74	62	558	181
Future Volume (vph)	141	142	330	49	178	88	420	661	74	62	558	181
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5		3.5	3.7	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.95	1.00	1.00	0.96	1.00	0.99		1.00	0.99	
Flpb, ped/bikes	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1751	1900	1526	1803	1900	1555	1805	3460		1805	3387	
Flt Permitted	0.55	1.00	1.00	0.62	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1017	1900	1526	1174	1900	1555	1805	3460		1805	3387	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	148	149	347	52	187	93	442	696	78	65	587	191
RTOR Reduction (vph)	0	0	256	0	0	68	0	8	0	0	29	0
Lane Group Flow (vph)	148	149	91	52	187	25	442	766	0	65	749	0
Confl. Peds. (#/hr)	22		46	2		34			36			10
Confl. Bikes (#/hr)			5			5			5			5
Heavy Vehicles (%)	2%	0%	1%	0%	0%	0%	0%	2%	0%	0%	2%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8		8	4		4						
Actuated Green, G (s)	21.5	21.5	21.5	21.5	21.5	21.5	24.6	37.2		11.9	24.3	
Effective Green, g (s)	21.5	21.5	21.5	21.5	21.5	21.5	24.6	37.2		11.9	24.3	
Actuated g/C Ratio	0.26	0.26	0.26	0.26	0.26	0.26	0.30	0.46		0.15	0.30	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5		3.5	3.7	
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0	4.0	2.5	3.0		2.5	3.0	
Lane Grp Cap (vph)	267	500	402	309	500	409	544	1577		263	1008	
v/s Ratio Prot		0.08			0.10		c0.24	0.22		0.04	c0.22	
v/s Ratio Perm	c0.15		0.06	0.04		0.02						
v/c Ratio	0.55	0.30	0.23	0.17	0.37	0.06	0.81	0.49		0.25	0.74	
Uniform Delay, d1	25.9	24.0	23.5	23.2	24.6	22.5	26.4	15.5		30.9	25.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.1	0.5	0.4	0.4	0.6	0.1	8.8	0.2		0.4	3.0	
Delay (s)	29.0	24.5	23.9	23.5	25.2	22.6	35.2	15.8		31.2	28.8	
Level of Service	C	C	C	C	C	C	D	B		C	C	
Approach Delay (s)		25.2			24.2			22.8			29.0	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM 2000 Control Delay	25.2	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.71			
Actuated Cycle Length (s)	81.6	Sum of lost time (s)	11.2	
Intersection Capacity Utilization	95.2%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

HCM 2010 AWSC
9: San Marin Dr/Sutro Ave & Novato Blvd #1

02/15/2018

Intersection	
Intersection Delay, s/veh	129.9
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	105	173	56	77	351	198	69	132	61	185	235	460
Future Vol, veh/h	105	173	56	77	351	198	69	132	61	185	235	460
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	111	182	59	81	369	208	73	139	64	195	247	484
Number of Lanes	1	1	0	1	1	0	1	1	0	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	3	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	3	2	2
HCM Control Delay	34.1	281.1	29.7	88.6
HCM LOS	D	F	D	F

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%	0%
Vol Thru, %	0%	68%	0%	76%	0%	64%	0%	100%	0%
Vol Right, %	0%	32%	0%	24%	0%	36%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	69	193	105	229	77	549	185	235	460
LT Vol	69	0	105	0	77	0	185	0	0
Through Vol	0	132	0	173	0	351	0	235	0
RT Vol	0	61	0	56	0	198	0	0	460
Lane Flow Rate	73	203	111	241	81	578	195	247	484
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.233	0.611	0.345	0.707	0.244	1.621	0.544	0.657	1.193
Departure Headway (Hd)	13.315	12.54	12.867	12.158	11.354	10.572	11.456	10.929	10.191
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	272	291	282	299	319	347	317	334	358
Service Time	11.015	10.24	10.567	9.858	9.054	8.272	9.156	8.629	7.891
HCM Lane V/C Ratio	0.268	0.698	0.394	0.806	0.254	1.666	0.615	0.74	1.352
HCM Control Delay	20	33.1	22.2	39.6	17.7	318	27	32.3	142.1
HCM Lane LOS	C	D	C	E	C	F	D	D	F
HCM 95th-tile Q	0.9	3.7	1.5	5	0.9	32.8	3.1	4.4	17.5

HCM Signalized Intersection Capacity Analysis
9: San Marin Dr/Sutro Ave & Novato Blvd #1 02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	173	56	77	351	198	69	132	61	185	235	460
Future Volume (vph)	105	173	56	77	351	198	69	132	61	185	235	460
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.95		1.00	0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1794		1770	1762		1770	1775		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	1794		1770	1762		1770	1775		1770	1863	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	111	182	59	81	369	208	73	139	64	195	247	484
RTOR Reduction (vph)	0	12	0	0	21	0	0	21	0	0	0	291
Lane Group Flow (vph)	111	229	0	81	556	0	73	182	0	195	247	193
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	7.1	29.2		6.5	28.6		4.6	14.4		11.6	21.4	21.4
Effective Green, g (s)	7.1	29.2		6.5	28.6		4.6	14.4		11.6	21.4	21.4
Actuated g/C Ratio	0.09	0.39		0.09	0.38		0.06	0.19		0.15	0.28	0.28
Clearance Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	166	692		151	665		107	337		271	526	447
v/s Ratio Prot	c0.06	0.13		0.05	c0.32		0.04	0.10		c0.11	c0.13	
v/s Ratio Perm												0.12
v/c Ratio	0.67	0.33		0.54	0.84		0.68	0.54		0.72	0.47	0.43
Uniform Delay, d1	33.2	16.4		33.2	21.4		34.8	27.7		30.5	22.5	22.2
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	9.8	0.3		3.6	9.0		16.5	1.7		8.8	0.7	0.7
Delay (s)	42.9	16.7		36.8	30.4		51.3	29.3		39.3	23.1	22.8
Level of Service	D	B		D	C		D	C		D	C	C
Approach Delay (s)		24.9			31.2			35.1			26.4	
Approach LOS		C			C			D			C	

Intersection Summary				
HCM 2000 Control Delay	28.7	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.73			
Actuated Cycle Length (s)	75.7	Sum of lost time (s)	14.0	
Intersection Capacity Utilization	72.9%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

MOVEMENT SUMMARY

Site: 9 [PM Cumulative]

Novato Boulevard/San Marin Dr-Sutro Ave
PM Cumulative with Project
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NB Sutro Ave											
3	L2	73	2.0	0.338	8.4	LOS A	1.6	40.9	0.62	0.60	32.6
8	T1	139	2.0	0.338	8.4	LOS A	1.6	40.9	0.62	0.60	32.6
18	R2	64	2.0	0.338	8.4	LOS A	1.6	40.9	0.62	0.60	31.7
Approach		276	2.0	0.338	8.4	LOS A	1.6	40.9	0.62	0.60	32.4
East: WB Novato Blvd											
1	L2	81	2.0	0.681	14.7	LOS B	9.5	240.4	0.79	0.93	30.1
6	T1	369	2.0	0.681	14.7	LOS B	9.5	240.4	0.79	0.93	30.1
16	R2	208	2.0	0.681	14.7	LOS B	9.5	240.4	0.79	0.93	29.4
Approach		659	2.0	0.681	14.7	LOS B	9.5	240.4	0.79	0.93	29.9
North: SB San Marin Drive											
7	L2	195	2.0	0.516	11.2	LOS B	3.7	93.2	0.69	0.80	31.0
4	T1	247	2.0	0.516	11.2	LOS B	3.7	93.2	0.69	0.80	30.9
14	R2	484	2.0	0.565	12.3	LOS B	4.6	116.0	0.72	0.87	30.4
Approach		926	2.0	0.565	11.8	LOS B	4.6	116.0	0.71	0.84	30.6
West: EB Novato Blvd											
5	L2	111	2.0	0.448	10.5	LOS B	2.7	69.8	0.69	0.76	31.5
2	T1	182	2.0	0.448	10.5	LOS B	2.7	69.8	0.69	0.76	31.5
12	R2	59	2.0	0.448	10.5	LOS B	2.7	69.8	0.69	0.76	30.7
Approach		352	2.0	0.448	10.5	LOS B	2.7	69.8	0.69	0.76	31.4
All Vehicles		2213	2.0	0.681	12.0	LOS B	9.5	240.4	0.72	0.82	30.7

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Organisation: W-TRANS | Processed: Tuesday, February 27, 2018 3:57:45 PM
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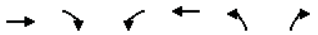
HCM Signalized Intersection Capacity Analysis
10: Wilson Ave & Novato Blvd #2

02/15/2018



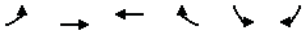
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	559	42	452	871	46	295
Future Volume (vph)	559	42	452	871	46	295
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.9		3.0	3.6	3.6	3.6
Lane Util. Factor	0.95		1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.99		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3533		1787	3610	1805	1593
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3533		1787	3610	1805	1593
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	588	44	476	917	48	311
RTOR Reduction (vph)	5	0	0	0	0	262
Lane Group Flow (vph)	627	0	476	917	48	49
Confl. Peds. (#/hr)		3			6	2
Heavy Vehicles (%)	1%	0%	1%	0%	0%	0%
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases						4
Actuated Green, G (s)	30.9		19.3	38.3	11.3	11.3
Effective Green, g (s)	30.9		19.3	38.3	11.3	11.3
Actuated g/C Ratio	0.43		0.27	0.53	0.16	0.16
Clearance Time (s)	3.9		3.0	3.6	3.6	3.6
Vehicle Extension (s)	3.0		2.0	3.0	2.0	2.0
Lane Grp Cap (vph)	1516		479	1920	283	250
v/s Ratio Prot	c0.18		c0.27	c0.25	0.03	
v/s Ratio Perm						c0.03
v/c Ratio	0.41		0.99	0.48	0.17	0.20
Uniform Delay, d1	14.3		26.3	10.6	26.3	26.4
Progression Factor	1.00		0.93	0.47	1.00	1.00
Incremental Delay, d2	0.8		35.3	0.7	0.1	0.1
Delay (s)	15.1		59.9	5.7	26.4	26.5
Level of Service	B		E	A	C	C
Approach Delay (s)	15.1			24.2	26.5	
Approach LOS	B			C	C	

Intersection Summary				
HCM 2000 Control Delay	22.1	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.58			
Actuated Cycle Length (s)	72.0	Sum of lost time (s)	10.5	
Intersection Capacity Utilization	59.7%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
11: Novato Blvd #2 & Simmons Ln

02/15/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	137	717	1037	106	113	296
Future Volume (vph)	137	717	1037	106	113	296
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.9	3.6		3.0	3.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	3574	3553		1805	1599
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1805	3574	3553		1805	1599
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	144	755	1092	112	119	312
RTOR Reduction (vph)	0	0	7	0	0	240
Lane Group Flow (vph)	144	755	1197	0	119	72
Confl. Peds. (#/hr)					2	
Confl. Bikes (#/hr)				1		
Heavy Vehicles (%)	0%	1%	0%	0%	0%	1%
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	5	2	6		8	
Permitted Phases						8
Actuated Green, G (s)	12.2	30.9	38.3		11.9	11.9
Effective Green, g (s)	12.2	30.9	38.3		11.9	11.9
Actuated g/C Ratio	0.17	0.43	0.53		0.17	0.17
Clearance Time (s)	3.0	3.9	3.6		3.0	3.0
Vehicle Extension (s)	2.0	3.0	3.0		2.0	2.0
Lane Grp Cap (vph)	305	1533	1889		298	264
v/s Ratio Prot	0.08	c0.21	c0.34		c0.07	
v/s Ratio Perm						0.04
v/c Ratio	0.47	0.49	0.63		0.40	0.27
Uniform Delay, d1	27.0	14.9	11.9		26.9	26.3
Progression Factor	0.68	0.51	1.00		1.00	1.00
Incremental Delay, d2	4.8	1.1	1.6		0.3	0.2
Delay (s)	23.2	8.6	13.5		27.2	26.5
Level of Service	C	A	B		C	C
Approach Delay (s)		11.0	13.5		26.7	
Approach LOS		B	B		C	

Intersection Summary				
HCM 2000 Control Delay	14.8	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.58			
Actuated Cycle Length (s)	72.0	Sum of lost time (s)	10.5	
Intersection Capacity Utilization	57.0%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
12: Grant Ave & Novato Blvd #2

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	160	677	1	2	952	54	1	6	4	25	1	288
Future Volume (vph)	160	677	1	2	952	54	1	6	4	25	1	288
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.5	4.5	3.5	4.9	4.9		4.0		3.5	3.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00		1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.95	1.00	1.00	0.96		0.98		1.00	0.98	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00		1.00		0.97	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.95		1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		1.00		0.95	1.00	
Satd. Flow (prot)	1787	1863	1534	1805	3539	1529		1762		1737	1591	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.53		0.75	1.00	
Satd. Flow (perm)	1787	1863	1534	1805	3539	1529		947		1372	1591	
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)	167	705	1	2	992	56	1	6	4	26	1	300
RTOR Reduction (vph)	0	0	0	0	0	19	0	4	0	0	269	0
Lane Group Flow (vph)	167	705	1	2	992	37	0	7	0	26	32	0
Confl. Peds. (#/hr)			11			8	1		14	14		1
Confl. Bikes (#/hr)			1			4			2			1
Heavy Vehicles (%)	1%	2%	0%	0%	2%	1%	0%	0%	0%	1%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8			4		
Actuated Green, G (s)	14.6	86.1	86.1	1.2	72.3	72.3		10.7		11.2	11.2	
Effective Green, g (s)	14.6	86.1	86.1	1.2	72.3	72.3		10.7		11.2	11.2	
Actuated g/C Ratio	0.13	0.78	0.78	0.01	0.66	0.66		0.10		0.10	0.10	
Clearance Time (s)	3.5	4.5	4.5	3.5	4.9	4.9		4.0		3.5	3.5	
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0	3.0		2.0		2.0	2.0	
Lane Grp Cap (vph)	237	1458	1200	19	2326	1004		92		139	161	
v/s Ratio Prot	c0.09	c0.38		0.00	0.28						c0.02	
v/s Ratio Perm			0.00			0.02		0.01		0.02		
v/c Ratio	0.70	0.48	0.00	0.11	0.43	0.04		0.08		0.19	0.20	
Uniform Delay, d1	45.6	4.2	2.6	53.9	9.0	6.6		45.2		45.2	45.3	
Progression Factor	1.00	1.00	1.00	1.41	0.23	0.20		1.00		1.00	1.00	
Incremental Delay, d2	7.5	1.2	0.0	0.6	0.4	0.0		0.1		0.2	0.2	
Delay (s)	53.2	5.3	2.6	76.4	2.4	1.4		45.3		45.5	45.5	
Level of Service	D	A	A	E	A	A		D		D	D	
Approach Delay (s)		14.5			2.5			45.3			45.5	
Approach LOS		B			A			D			D	

Intersection Summary				
HCM 2000 Control Delay	13.5	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.50			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.4	
Intersection Capacity Utilization	69.2%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
13: Tamalpais Ave/7th St & Novato Blvd #2

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	135	593	43	72	857	215	44	124	46	185	112	125
Future Volume (vph)	135	593	43	72	857	215	44	124	46	185	112	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.0		3.5	5.0	5.0	3.5	3.5		3.5	3.5	3.5
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.96	1.00	0.99		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.99	1.00		0.99	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1787	1839		1787	1863	1542	1768	1782		1765	1881	1547
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.61	1.00		0.49	1.00	1.00
Satd. Flow (perm)	1787	1839		1787	1863	1542	1144	1782		918	1881	1547
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)	141	618	45	75	893	224	46	129	48	193	117	130
RTOR Reduction (vph)	0	2	0	0	0	33	0	13	0	0	0	101
Lane Group Flow (vph)	141	661	0	75	893	191	46	164	0	193	117	29
Confl. Peds. (#/hr)			10			6	5		7	7		5
Confl. Bikes (#/hr)			3			2			5			
Heavy Vehicles (%)	1%	2%	1%	1%	2%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8			4		4
Actuated Green, G (s)	12.7	65.9		7.4	60.6	60.6	24.7	24.7		24.7	24.7	24.7
Effective Green, g (s)	12.7	65.9		7.4	60.6	60.6	24.7	24.7		24.7	24.7	24.7
Actuated g/C Ratio	0.12	0.60		0.07	0.55	0.55	0.22	0.22		0.22	0.22	0.22
Clearance Time (s)	3.5	5.0		3.5	5.0	5.0	3.5	3.5		3.5	3.5	3.5
Vehicle Extension (s)	2.0	5.0		2.0	5.0	5.0	2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	206	1101		120	1026	849	256	400		206	422	347
v/s Ratio Prot	c0.08	0.36		0.04	c0.48			0.09			0.06	
v/s Ratio Perm						0.12	0.04			c0.21		0.02
v/c Ratio	0.68	0.60		0.62	0.87	0.22	0.18	0.41		0.94	0.28	0.08
Uniform Delay, d1	46.7	13.8		49.9	21.3	12.7	34.5	36.4		41.9	35.3	33.7
Progression Factor	0.90	1.13		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	6.8	2.3		7.1	10.0	0.6	0.1	0.2		44.3	0.1	0.0
Delay (s)	48.7	17.8		57.1	31.4	13.3	34.6	36.7		86.2	35.4	33.7
Level of Service	D	B		E	C	B	C	D		F	D	C
Approach Delay (s)		23.3			29.6			36.2			57.2	
Approach LOS		C			C			D			E	

Intersection Summary				
HCM 2000 Control Delay	32.8	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.86			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	89.0%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
14: Diablo Ave & Novato Blvd #2

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	258	23	290	337	670	51	472	239	469	354	12
Future Volume (vph)	24	258	23	290	337	670	51	472	239	469	354	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	11	11	12	11	11	12	12	12	12
Total Lost time (s)		3.7		4.1	4.1	4.1	4.4	4.4	4.4	4.1	4.1	
Lane Util. Factor		0.95		0.91	0.91	1.00	1.00	1.00	1.00	0.91	0.91	
Frpb, ped/bikes		1.00		1.00	1.00	0.95	1.00	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	1.00	
Frt		0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		1.00		0.95	0.99	1.00	0.95	1.00	1.00	0.95	0.98	
Satd. Flow (prot)		3513		1557	3269	1500	1728	1801	1560	1610	3320	
Flt Permitted		1.00		0.95	0.99	1.00	0.95	1.00	1.00	0.95	0.98	
Satd. Flow (perm)		3513		1557	3269	1500	1728	1801	1560	1610	3320	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	25	272	24	305	355	705	54	497	252	494	373	13
RTOR Reduction (vph)	0	5	0	0	0	287	0	0	146	0	1	0
Lane Group Flow (vph)	0	316	0	213	447	418	54	497	106	287	592	0
Confl. Peds. (#/hr)			10			15			2			3
Confl. Bikes (#/hr)			1			1						6
Heavy Vehicles (%)	1%	1%	1%	2%	1%	2%	1%	2%	2%	2%	2%	1%
Turn Type	Split	NA		Split	NA	Perm	Split	NA	Perm	Split	NA	
Protected Phases	3	3		4	4		1	1		2	2	
Permitted Phases						4			1		2	
Actuated Green, G (s)		16.0		29.1	29.1	29.1	32.2	32.2	32.2	25.1	25.1	
Effective Green, g (s)		16.0		29.1	29.1	29.1	32.2	32.2	32.2	25.1	25.1	
Actuated g/C Ratio		0.13		0.25	0.25	0.25	0.27	0.27	0.27	0.21	0.21	
Clearance Time (s)		3.7		4.1	4.1	4.1	4.4	4.4	4.4	4.1	4.1	
Vehicle Extension (s)		2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)		473		381	801	367	468	488	423	340	702	
v/s Ratio Prot		c0.09		0.14	0.14		0.03	c0.28		0.18	c0.18	
v/s Ratio Perm						c0.28			0.07			
v/c Ratio		0.67		0.56	0.56	1.14	0.12	1.02	0.25	0.84	0.84	
Uniform Delay, d1		48.8		39.2	39.2	44.8	32.5	43.2	33.8	44.9	44.9	
Progression Factor		1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		2.8		1.0	0.5	90.5	0.0	45.5	0.1	16.5	8.8	
Delay (s)		51.6		40.2	39.7	135.3	32.6	88.7	33.9	61.4	53.7	
Level of Service		D		D	D	F	C	F	C	E	D	
Approach Delay (s)		51.6			89.1			67.8			56.2	
Approach LOS		D			F			E			E	

Intersection Summary				
HCM 2000 Control Delay	71.9	HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio	0.95			
Actuated Cycle Length (s)	118.7	Sum of lost time (s)	16.3	
Intersection Capacity Utilization	90.6%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
14: Diablo Ave & Novato Blvd #2

02/15/2018

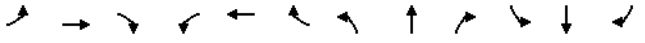
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	258	23	290	337	670	51	472	239	469	354	12
Future Volume (vph)	24	258	23	290	337	670	51	472	239	469	354	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	12	11	11	12	10	12	12
Total Lost time (s)	4.0	4.1	4.1	4.0	4.0	4.0	4.0	4.1		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		0.97	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1728	1818	1511	1711	1818	1554	1728	3233		3204	1852	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1728	1818	1511	1711	1818	1554	1728	3233		3204	1852	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	25	272	24	305	355	705	54	497	252	494	373	13
RTOR Reduction (vph)	0	0	19	0	0	79	0	54	0	0	1	0
Lane Group Flow (vph)	25	272	5	305	355	626	54	695	0	494	385	0
Confl. Peds. (#/hr)			10			15			2			3
Confl. Bikes (#/hr)			1			1						6
Heavy Vehicles (%)	1%	1%	1%	2%	1%	2%	1%	2%	2%	2%	2%	1%
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	4.9	20.2	20.2	23.0	38.4	56.7	6.5	26.4		18.3	38.3	
Effective Green, g (s)	4.9	20.2	20.2	23.0	38.4	56.7	6.5	26.4		18.3	38.3	
Actuated g/C Ratio	0.05	0.19	0.19	0.22	0.37	0.54	0.06	0.25		0.18	0.37	
Clearance Time (s)	4.0	4.1	4.1	4.0	4.0	4.0	4.0	4.1		4.0	4.0	
Vehicle Extension (s)	3.0	2.0	2.0	3.0	3.0	3.0	3.0	2.0		3.0	3.0	
Lane Grp Cap (vph)	81	352	293	378	670	846	107	819		563	681	
v/s Ratio Prot	0.01	0.15		c0.18	0.20	c0.13	0.03	c0.21		c0.15	0.21	
v/s Ratio Perm			0.00			0.27						
v/c Ratio	0.31	0.77	0.02	0.81	0.53	0.74	0.50	0.85		0.88	0.56	
Uniform Delay, d1	48.0	39.8	33.9	38.4	25.8	18.1	47.2	36.9		41.8	26.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.2	9.2	0.0	11.9	0.8	3.4	3.7	7.8		14.4	1.1	
Delay (s)	50.1	49.0	33.9	50.3	26.5	21.5	51.0	44.8		56.2	27.3	
Level of Service	D	D	C	D	C	C	D	D		E	C	
Approach Delay (s)		48.0			29.2			45.2			43.5	
Approach LOS		D			C			D			D	

Intersection Summary				
HCM 2000 Control Delay	38.6	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.83			
Actuated Cycle Length (s)	104.1	Sum of lost time (s)	16.2	
Intersection Capacity Utilization	81.7%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
15: Redwood Blvd & Diablo Ave/De Long Ave

02/15/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	293	592	111	109	991	437	142	328	87	362	248	252
Future Volume (vph)	293	592	111	109	991	437	142	328	87	362	248	252
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	9
Total Lost time (s)	4.0	3.7		4.0	4.1		3.5	4.8	4.8	3.5	3.5	3.5
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95	1.00	0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3467	3525		1805	3332		1805	3610	1508	3303	1900	1394
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3467	3525		1805	3332		1805	3610	1508	3303	1900	1394
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	299	604	113	111	1011	446	145	335	89	369	253	257
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	33	0	0	49
Lane Group Flow (vph)	299	717	0	111	1457	0	145	335	56	369	253	208
Confl. Peds. (#/hr)						2			7			14
Confl. Bikes (#/hr)												3
Heavy Vehicles (%)	1%	0%	0%	0%	2%	5%	0%	0%	5%	6%	0%	1%
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)	17.1	59.7		17.0	59.2		14.6	23.4	23.4	13.9	24.0	24.0
Effective Green, g (s)	17.1	59.7		17.0	59.2		14.6	23.4	23.4	13.9	24.0	24.0
Actuated g/C Ratio	0.13	0.46		0.13	0.46		0.11	0.18	0.18	0.11	0.18	0.18
Clearance Time (s)	4.0	3.7		4.0	4.1		3.5	4.8	4.8	3.5	3.5	3.5
Vehicle Extension (s)	2.5	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	456	1618		236	1517		202	649	271	353	350	257
v/s Ratio Prot	c0.09	0.20		0.06	c0.44		0.08	0.09		c0.11	0.13	
v/s Ratio Perm									0.04			c0.15
v/c Ratio	0.66	0.44		0.47	0.96		0.72	0.52	0.21	1.05	0.72	0.81
Uniform Delay, d1	53.7	23.9		52.3	34.3		55.7	48.2	45.4	58.0	49.9	50.8
Progression Factor	1.00	1.00		1.44	0.57		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.0	0.9		0.3	9.7		9.7	0.3	0.1	60.2	6.1	16.1
Delay (s)	56.7	24.7		75.4	29.2		65.4	48.5	45.5	118.3	56.0	66.9
Level of Service	E	C		E	C		E	D	D	F	E	E
Approach Delay (s)		34.1			32.5			52.3			85.3	
Approach LOS		C			C			D			F	

Intersection Summary				
HCM 2000 Control Delay	47.2	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.90			
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.4	
Intersection Capacity Utilization	98.6%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
16: Reichert Ave & De Long Ave

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	87	912	23	100	1405	359	19	32	60	257	19	83
Future Volume (vph)	87	912	23	100	1405	359	19	32	60	257	19	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.1		3.0	4.1		3.5	3.5	3.5	3.5	3.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00	0.98	1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00	1.00	0.99	1.00	
Frt	1.00	1.00		1.00	0.97		1.00	1.00	0.85	1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1805	3525		1805	3428		1794	1900	1577	1763	1636	
Flt Permitted	0.95	1.00		0.95	1.00		0.62	1.00	1.00	0.73	1.00	
Satd. Flow (perm)	1805	3525		1805	3428		1170	1900	1577	1364	1636	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	92	960	24	105	1479	378	20	34	63	271	20	87
RTOR Reduction (vph)	0	1	0	0	14	0	0	0	15	0	28	0
Lane Group Flow (vph)	92	983	0	105	1843	0	20	34	48	271	79	0
Confl. Peds. (#/hr)			5			11	5		5	11		5
Confl. Bikes (#/hr)			5			5			5			5
Heavy Vehicles (%)	0%	2%	0%	0%	1%	1%	0%	0%	0%	1%	0%	0%
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	11.0	79.4		11.0	79.4		29.0	29.0	29.0	29.0	29.0	
Effective Green, g (s)	11.0	79.4		11.0	79.4		29.0	29.0	29.0	29.0	29.0	
Actuated g/C Ratio	0.08	0.61		0.08	0.61		0.22	0.22	0.22	0.22	0.22	
Clearance Time (s)	3.0	4.1		3.0	4.1		3.5	3.5	3.5	3.5	3.5	
Vehicle Extension (s)	2.0	3.0		2.0	3.0		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	152	2152		152	2093		261	423	351	304	364	
v/s Ratio Prot	0.05	0.28		c0.06	c0.54			0.02			0.05	
v/s Ratio Perm							0.02		0.03	c0.20		
v/c Ratio	0.61	0.46		0.69	0.88		0.08	0.08	0.14	0.89	0.22	
Uniform Delay, d1	57.4	13.7		57.8	21.3		39.9	40.0	40.5	49.0	41.2	
Progression Factor	0.72	1.19		1.01	0.69		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.6	0.5		8.0	4.5		0.0	0.0	0.1	25.6	0.1	
Delay (s)	44.9	16.8		66.3	19.2		40.0	40.0	40.5	74.6	41.3	
Level of Service	D	B		E	B		D	D	D	E	D	
Approach Delay (s)		19.2			21.7			40.3			65.2	
Approach LOS		B			C			D			E	

Intersection Summary				
HCM 2000 Control Delay	26.2	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.87			
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	10.6	
Intersection Capacity Utilization	89.3%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
17: US 101 SB Ramps & De Long Ave

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	223	1047	28	1802	0	0	0	0	10	7	187
Future Volume (vph)	0	223	1047	28	1802	0	0	0	0	10	7	187
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.6	3.6	3.0	3.6					4.0	4.0	
Lane Util. Factor		0.95	1.00	1.00	0.95					0.95	0.95	
Frt		1.00	0.85	1.00	1.00					1.00	0.86	
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (prot)		3574	1599	1770	3539					1681	1514	
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (perm)		3574	1599	1770	3539					1681	1514	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	228	1068	29	1839	0	0	0	0	10	7	191
RTOR Reduction (vph)	0	0	280	0	0	0	0	0	0	0	37	0
Lane Group Flow (vph)	0	228	788	29	1839	0	0	0	0	9	162	0
Heavy Vehicles (%)	0%	1%	1%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type		NA	Perm	Prot	NA					Split	NA	
Protected Phases		6		5	2					4	4	
Permitted Phases			6									
Actuated Green, G (s)		91.5	91.5	9.4	103.9					18.5	18.5	
Effective Green, g (s)		91.5	91.5	9.4	103.9					18.5	18.5	
Actuated g/C Ratio		0.70	0.70	0.07	0.80					0.14	0.14	
Clearance Time (s)		3.6	3.6	3.0	3.6					4.0	4.0	
Vehicle Extension (s)		4.0	4.0	2.0	4.0					2.5	2.5	
Lane Grp Cap (vph)		2515	1125	127	2828					239	215	
v/s Ratio Prot		0.06		0.02	c0.52					0.01	c0.11	
v/s Ratio Perm			c0.49									
v/c Ratio		0.09	0.70	0.23	0.65					0.04	0.75	
Uniform Delay, d1		6.1	11.3	56.9	5.5					48.1	53.6	
Progression Factor		0.75	4.38	0.88	0.61					1.00	1.00	
Incremental Delay, d2		0.1	3.2	0.2	0.8					0.0	13.3	
Delay (s)		4.6	52.5	50.5	4.1					48.1	66.9	
Level of Service		A	D	D	A					D	E	
Approach Delay (s)		44.1			4.8			0.0			66.0	
Approach LOS		D			A			A			E	

Intersection Summary				
HCM 2000 Control Delay	23.7	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.71			
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	10.6	
Intersection Capacity Utilization	132.6%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
18: US 101 NB Ramps & De Long Ave

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	190	45	0	0	63	29	1754	25	33	0	0	0
Future Volume (vph)	190	45	0	0	63	29	1754	25	33	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.6			3.6		4.5	4.5				
Lane Util. Factor	1.00	0.95			0.95		0.95	0.95				
Frpb, ped/bikes	1.00	1.00			1.00		1.00	1.00				
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00				
Frt	1.00	1.00			0.95		1.00	0.99				
Flt Protected	0.95	1.00			1.00		0.95	0.96				
Satd. Flow (prot)	1770	3610			3353		1698	1695				
Flt Permitted	0.95	1.00			1.00		0.95	0.96				
Satd. Flow (perm)	1770	3610			3353		1698	1695				
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)	198	47	0	0	66	30	1827	26	34	0	0	0
RTOR Reduction (vph)	0	0	0	0	28	0	0	1	0	0	0	0
Lane Group Flow (vph)	198	47	0	0	68	0	950	936	0	0	0	0
Confl. Peds. (#/hr)						1						
Heavy Vehicles (%)	2%	0%	0%	0%	0%	7%	1%	0%	6%	0%	0%	0%
Turn Type	Prot	NA			NA		Split	NA				
Protected Phases	1	6			2		4	4				
Permitted Phases												
Actuated Green, G (s)	16.1	27.9			8.3		94.0	94.0				
Effective Green, g (s)	16.1	27.9			8.3		94.0	94.0				
Actuated g/C Ratio	0.12	0.21			0.06		0.72	0.72				
Clearance Time (s)	3.5	3.6			3.6		4.5	4.5				
Vehicle Extension (s)	2.5	2.0			2.0		3.0	3.0				
Lane Grp Cap (vph)	219	774			214		1227	1225				
v/s Ratio Prot	c0.11	0.01			c0.02		c0.56	0.55				
v/s Ratio Perm												
v/c Ratio	0.90	0.06			0.32		0.77	0.76				
Uniform Delay, d1	56.2	40.6			58.1		11.3	11.1				
Progression Factor	1.05	1.13			1.00		1.00	1.00				
Incremental Delay, d2	35.6	0.0			0.3		4.8	4.6				
Delay (s)	94.6	45.8			58.5		16.1	15.7				
Level of Service	F	D			E		B	B				
Approach Delay (s)		85.2			58.5			15.9			0.0	
Approach LOS		F			E			B			A	

Intersection Summary				
HCM 2000 Control Delay	25.4	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.76			
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	11.6	
Intersection Capacity Utilization	132.6%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
19: Redwood Blvd & Lamont Ave

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	4	24	48	3	57	22	525	63	74	453	16
Future Volume (vph)	33	4	24	48	3	57	22	525	63	74	453	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	3.5		3.5	3.5	3.5	4.8		3.5	4.8	4.8
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes		1.00	1.00		1.00	0.99	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85		1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected		0.96	1.00		0.95	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1818	1615		1814	1595	1805	3544		1805	3610	1615
Flt Permitted		0.79	1.00		0.77	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1504	1615		1461	1595	1805	3544		1805	3610	1615
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	35	4	25	51	3	60	23	553	66	78	477	17
RTOR Reduction (vph)	0	0	19	0	0	46	0	8	0	0	0	8
Lane Group Flow (vph)	0	39	6	0	54	14	23	611	0	78	477	9
Confl. Peds. (#/hr)	1					1			2			
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8		8	4		4						2
Actuated Green, G (s)		12.2	12.2		12.2	12.2	1.0	22.7		5.4	27.1	27.1
Effective Green, g (s)		12.2	12.2		12.2	12.2	1.0	22.7		5.4	27.1	27.1
Actuated g/C Ratio		0.23	0.23		0.23	0.23	0.02	0.44		0.10	0.52	0.52
Clearance Time (s)		3.5	3.5		3.5	3.5	3.5	4.8		3.5	4.8	4.8
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0	3.0		2.0	3.0	3.0
Lane Grp Cap (vph)		352	378		342	373	34	1544		187	1877	840
v/s Ratio Prot							0.01	c0.17		c0.04	0.13	
v/s Ratio Perm		0.03	0.00		c0.04	0.01						0.01
v/c Ratio		0.11	0.02		0.16	0.04	0.68	0.40		0.42	0.25	0.01
Uniform Delay, d1		15.7	15.3		15.9	15.4	25.4	10.0		21.9	6.9	6.0
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		0.1	0.0		0.1	0.0	34.5	0.2		0.5	0.1	0.0
Delay (s)		15.7	15.3		15.9	15.4	59.9	10.2		22.4	7.0	6.0
Level of Service		B	B		B	B	E	B		C	A	A
Approach Delay (s)		15.6			15.7			12.0			9.1	
Approach LOS		B			B			B			A	

Intersection Summary				
HCM 2000 Control Delay	11.2	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.33			
Actuated Cycle Length (s)	52.1	Sum of lost time (s)	11.8	
Intersection Capacity Utilization	46.7%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
20: Redwood Blvd & Landing Ct

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	3	30	0	27	1	592	27	18	572	1
Future Volume (vph)	0	0	3	30	0	27	1	592	27	18	572	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5		3.5		3.5		4.8	4.8	3.5	4.8	4.8
Lane Util. Factor		1.00		1.00		1.00		0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes		0.99		1.00		1.00		1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes		1.00		1.00		1.00		1.00	1.00	1.00	1.00	1.00
Frt		0.86		1.00		0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected		1.00		0.95		1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1622		1802		1615		3610	1579	1805	3610	1571
Flt Permitted		1.00		0.76		1.00		0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1622		1434		1615		3446	1579	1805	3610	1571
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	3	32	0	28	1	623	28	19	602	1
RTOR Reduction (vph)	0	3	0	0	0	24	0	0	12	0	0	0
Lane Group Flow (vph)	0	0	0	32	0	4	0	624	16	19	602	1
Confl. Peds. (#/hr)			4	4					3			6
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type		NA		Perm		Perm	Perm	NA	Perm	Prot	NA	Perm
Protected Phases		4						2		1	6	
Permitted Phases	4			8		8	2		2			6
Actuated Green, G (s)		7.0		7.0		7.0		28.0	28.0	0.8	32.3	32.3
Effective Green, g (s)		7.0		7.0		7.0		28.0	28.0	0.8	32.3	32.3
Actuated g/C Ratio		0.15		0.15		0.15		0.59	0.59	0.02	0.68	0.68
Clearance Time (s)		3.5		3.5		3.5		4.8	4.8	3.5	4.8	4.8
Vehicle Extension (s)		3.0		2.0		2.0		4.0	4.0	2.0	4.0	4.0
Lane Grp Cap (vph)		238		210		237		2027	928	30	2449	1066
v/s Ratio Prot		0.00								c0.01	0.17	
v/s Ratio Perm				c0.02		0.00		c0.18	0.01			0.00
v/c Ratio		0.00		0.15		0.02		0.31	0.02	0.63	0.25	0.00
Uniform Delay, d1		17.3		17.7		17.4		4.9	4.1	23.3	3.0	2.5
Progression Factor		1.00		1.00		1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.0		0.1		0.0		0.1	0.0	27.8	0.1	0.0
Delay (s)		17.3		17.8		17.4		5.0	4.1	51.1	3.0	2.5
Level of Service		B		B		B		A	A	D	A	A
Approach Delay (s)		17.3			17.6			5.0			4.5	
Approach LOS		B			B			A			A	

Intersection Summary				
HCM 2000 Control Delay	5.4	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.28			
Actuated Cycle Length (s)	47.6	Sum of lost time (s)	11.8	
Intersection Capacity Utilization	42.6%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
21: Novato Blvd #3 & Center Rd/Garden Ct

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	155	1	206	4	2	2	210	607	5	2	582	102
Future Volume (vph)	155	1	206	4	2	2	210	607	5	2	582	102
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.2	3.2			3.0		3.0	4.4		3.0	4.4	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.85			0.97		1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1616			1791		1805	3605		1805	3483	
Flt Permitted	0.75	1.00			0.90		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1430	1616			1654		1805	3605		1805	3483	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	163	1	217	4	2	2	221	639	5	2	613	107
RTOR Reduction (vph)	0	180	0	0	2	0	0	0	0	0	10	0
Lane Group Flow (vph)	163	38	0	0	6	0	221	644	0	2	710	0
Confl. Peds. (#/hr)									9			6
Confl. Bikes (#/hr)									2			
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4								
Actuated Green, G (s)	16.9	16.9			17.1		16.6	70.3		2.2	55.9	
Effective Green, g (s)	16.9	16.9			17.1		16.6	70.3		2.2	55.9	
Actuated g/C Ratio	0.17	0.17			0.17		0.17	0.70		0.02	0.56	
Clearance Time (s)	3.2	3.2			3.0		3.0	4.4		3.0	4.4	
Vehicle Extension (s)	3.0	3.0			2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	241	273			282		299	2534		39	1946	
v/s Ratio Prot		0.02					c0.12	0.18		0.00	c0.20	
v/s Ratio Perm	c0.11				0.00							
v/c Ratio	0.68	0.14			0.02		0.74	0.25		0.05	0.37	
Uniform Delay, d1	39.0	35.4			34.5		39.6	5.4		47.9	12.2	
Progression Factor	1.00	1.00			1.00		0.91	1.45		1.00	1.00	
Incremental Delay, d2	7.3	0.2			0.0		7.7	0.2		0.2	0.5	
Delay (s)	46.3	35.6			34.5		44.0	8.0		48.1	12.7	
Level of Service	D	D			C		D	A		D	B	
Approach Delay (s)		40.2			34.5			17.2			12.8	
Approach LOS		D			C			B			B	

Intersection Summary				
HCM 2000 Control Delay	20.1	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.49			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.6	
Intersection Capacity Utilization	56.6%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
22: Novato Blvd #3 & Arthur Street

02/15/2018

Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	93	128	158	893	7	751	87
Future Volume (vph)	93	128	158	893	7	751	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5	3.5	4.9	3.5	4.9	
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	0.95	
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	1.00	0.98	
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1797	1589	1805	3574	1805	3554	
Flt Permitted	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (perm)	1797	1589	1805	3574	1805	3554	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	98	135	166	940	7	791	92
RTOR Reduction (vph)	0	118	0	0	0	5	0
Lane Group Flow (vph)	98	17	166	940	7	878	0
Confl. Peds. (#/hr)	4	2					
Confl. Bikes (#/hr)		1					
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%	0%
Turn Type	Perm	Perm	Prot	NA	Prot	NA	
Protected Phases			1	6	5	2	
Permitted Phases	4	4					
Actuated Green, G (s)	12.5	12.5	13.7	74.4	1.2	61.9	
Effective Green, g (s)	12.5	12.5	13.7	74.4	1.2	61.9	
Actuated g/C Ratio	0.12	0.12	0.14	0.74	0.01	0.62	
Clearance Time (s)	3.5	3.5	3.5	4.9	3.5	4.9	
Vehicle Extension (s)	2.0	2.0	2.0	4.0	2.0	4.0	
Lane Grp Cap (vph)	224	198	247	2659	21	2199	
v/s Ratio Prot			c0.09	0.26	0.00	c0.25	
v/s Ratio Perm	c0.05	0.01					
v/c Ratio	0.44	0.09	0.67	0.35	0.33	0.40	
Uniform Delay, d1	40.5	38.7	41.0	4.4	49.0	9.6	
Progression Factor	1.00	1.00	0.87	1.21	0.83	1.10	
Incremental Delay, d2	0.5	0.1	3.6	0.2	3.3	0.5	
Delay (s)	41.0	38.8	39.1	5.6	43.8	11.1	
Level of Service	D	D	D	A	D	B	
Approach Delay (s)	39.7			10.7		11.4	
Approach LOS	D			B		B	

Intersection Summary				
HCM 2000 Control Delay	14.0	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.45			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.9	
Intersection Capacity Utilization	49.3%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
23: Novato Blvd #3 & Rowland Boulevard 02/15/2018

Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	40	128	16	28	240	203	621	28	369	188	449	389
Future Volume (vph)	40	128	16	28	240	203	621	28	369	188	449	389
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5			3.5	4.1	4.1	3.5	4.1		3.5	4.4
Lane Util. Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00		0.97	1.00
Frpb, ped/bikes	1.00	0.99			1.00	1.00	0.99	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	1.00
Frt	1.00	0.98			1.00	1.00	0.85	1.00	0.95		1.00	0.98
Flt Protected	0.95	1.00			0.95	1.00	1.00	0.95	1.00		0.95	1.00
Satd. Flow (prot)	1805	1858			1789	1900	1592	1805	1775		3502	1852
Flt Permitted	0.95	1.00			0.95	1.00	1.00	0.95	1.00		0.95	1.00
Satd. Flow (perm)	1805	1858			1789	1900	1592	1805	1775		3502	1852
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	42	135	17	29	253	214	654	29	388	198	473	409
RTOR Reduction (vph)	0	5	0	0	0	0	386	0	16	0	0	5
Lane Group Flow (vph)	42	147	0	0	282	214	268	29	570	0	473	471
Confl. Peds. (#/hr)			13				2			5		
Confl. Bikes (#/hr)			1							1		
Heavy Vehicles (%)	0%	0%	0%	0%	1%	0%	0%	0%	1%	1%	0%	0%
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Prot	NA		Prot	NA
Protected Phases	3	8		7	7	4		1	6		5	2
Permitted Phases							4					
Actuated Green, G (s)	5.5	16.6			15.5	26.0	26.0	6.0	39.1		14.2	47.0
Effective Green, g (s)	5.5	16.6			15.5	26.0	26.0	6.0	39.1		14.2	47.0
Actuated g/C Ratio	0.06	0.17			0.16	0.26	0.26	0.06	0.39		0.14	0.47
Clearance Time (s)	3.5	3.5			3.5	4.1	4.1	3.5	4.1		3.5	4.4
Vehicle Extension (s)	2.0	2.0			2.0	2.0	2.0	2.0	3.0		2.0	2.0
Lane Grp Cap (vph)	99	308			277	494	413	108	694		497	870
v/s Ratio Prot	0.02	c0.08			c0.16	0.11		0.02	c0.32		c0.14	0.25
v/s Ratio Perm							c0.17					
v/c Ratio	0.42	0.48			1.02	0.43	0.65	0.27	0.82		0.95	0.54
Uniform Delay, d1	45.7	37.8			42.2	30.9	32.9	44.9	27.3		42.6	18.8
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00		0.70	0.54
Incremental Delay, d2	1.1	0.4			58.8	0.2	2.8	0.5	7.8		29.0	2.3
Delay (s)	46.8	38.2			101.0	31.1	35.7	45.4	35.1		58.7	12.5
Level of Service	D	D			F	C	D	D	D		E	B
Approach Delay (s)		40.1				50.9			35.6			35.5
Approach LOS		D				D			D			D

Intersection Summary				
HCM 2000 Control Delay	41.9	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.84			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.5	
Intersection Capacity Utilization	87.4%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

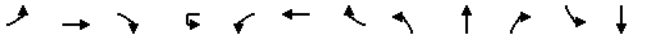
HCM Signalized Intersection Capacity Analysis
23: Novato Blvd #3 & Rowland Boulevard 02/15/2018

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	64
Future Volume (vph)	64
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.95
Adj. Flow (vph)	67
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	6
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	0%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Novato General Plan Update EIR W-Trans
PM Peak Hour Cumulative with Project

HCM Signalized Intersection Capacity Analysis
24: Rowland Boulevard & Redwood Blvd 02/15/2018



Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	116	655	49	1	142	982	456	24	30	64	433	27
Future Volume (vph)	116	655	49	1	142	982	456	24	30	64	433	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.5	4.5		3.5	4.5		3.5	4.1		3.5	4.8
Lane Util. Factor	1.00	0.95	1.00		1.00	0.95		1.00	0.95		0.97	1.00
Frpb, ped/bikes	1.00	1.00	0.98		1.00	1.00		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	1.00
Frt	1.00	1.00	0.85		1.00	0.95		1.00	0.90		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00		0.95	1.00		0.95	1.00
Satd. Flow (prot)	1805	3574	1590		1805	3422		1805	3209		3502	1900
Flt Permitted	0.95	1.00	1.00		0.95	1.00		0.95	1.00		0.95	1.00
Satd. Flow (perm)	1805	3574	1590		1805	3422		1805	3209		3502	1900
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	122	689	52	1	149	1034	480	25	32	67	456	28
RTOR Reduction (vph)	0	0	31	0	0	41	0	0	57	0	0	0
Lane Group Flow (vph)	122	689	21	0	150	1473	0	25	42	0	456	28
Confl. Peds. (#/hr)			4				4			3		
Confl. Bikes (#/hr)										1		
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	Prot	NA		Prot	NA		Prot	NA
Protected Phases	5	2		1	1	6		3	8		7	4
Permitted Phases			2									
Actuated Green, G (s)	11.2	38.2	38.2		12.7	39.7		4.0	13.9		12.8	22.0
Effective Green, g (s)	11.2	38.2	38.2		12.7	39.7		4.0	13.9		12.8	22.0
Actuated g/C Ratio	0.12	0.41	0.41		0.14	0.43		0.04	0.15		0.14	0.24
Clearance Time (s)	3.5	4.5	4.5		3.5	4.5		3.5	4.1		3.5	4.8
Vehicle Extension (s)	2.0	4.0	4.0		2.0	4.0		2.0	2.5		2.5	2.5
Lane Grp Cap (vph)	216	1464	651		245	1457		77	478		480	448
v/s Ratio Prot	0.07	0.19			c0.08	c0.43		0.01	0.01		c0.13	0.01
v/s Ratio Perm			0.01									
v/c Ratio	0.56	0.47	0.03		0.61	1.01		0.32	0.09		0.95	0.06
Uniform Delay, d1	38.7	20.1	16.4		37.9	26.8		43.3	34.2		39.9	27.6
Progression Factor	1.00	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	2.0	0.3	0.0		3.2	26.2		0.9	0.1		28.4	0.0
Delay (s)	40.7	20.4	16.5		41.1	53.0		44.2	34.2		68.3	27.6
Level of Service	D	C	B		D	D		D	C		E	C
Approach Delay (s)		23.1				51.9			36.2			56.7
Approach LOS		C				D			D			E

Intersection Summary				
HCM 2000 Control Delay	44.7	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.80			
Actuated Cycle Length (s)	93.2	Sum of lost time (s)	16.3	
Intersection Capacity Utilization	81.7%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
24: Rowland Boulevard & Redwood Blvd 02/15/2018

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	148
Future Volume (vph)	148
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.8
Lane Util. Factor	1.00
Frpb, ped/bikes	0.99
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1593
Flt Permitted	1.00
Satd. Flow (perm)	1593
Peak-hour factor, PHF	0.95
Adj. Flow (vph)	156
RTOR Reduction (vph)	119
Lane Group Flow (vph)	37
Confl. Peds. (#/hr)	2
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	0%
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	22.0
Effective Green, g (s)	22.0
Actuated g/C Ratio	0.24
Clearance Time (s)	4.8
Vehicle Extension (s)	2.5
Lane Grp Cap (vph)	376
v/s Ratio Prot	
v/s Ratio Perm	c0.02
v/c Ratio	0.10
Uniform Delay, d1	27.8
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	27.9
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary

Novato General Plan Update EIR W-Trans
PM Peak Hour Cumulative with Project

HCM Signalized Intersection Capacity Analysis
25: Rowland Boulevard & Highway 101 SB Ramps 02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	545	615	765	1365	0	0	0	0	321	6	186
Future Volume (vph)	0	545	615	765	1365	0	0	0	0	321	6	186
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	3.0	4.0					3.0	3.0	
Lane Util. Factor		0.91	0.91	0.97	0.95					0.91	0.91	
Frpb, ped/bikes		1.00	0.99	1.00	1.00					1.00	0.99	
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	
Frt		0.95	0.85	1.00	1.00					1.00	0.92	
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.98	
Satd. Flow (prot)		3255	1450	3502	3610					1643	3057	
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.98	
Satd. Flow (perm)		3255	1450	3502	3610					1643	3057	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	574	647	805	1437	0	0	0	0	338	6	196
RTOR Reduction (vph)	0	55	241	0	0	0	0	0	0	0	12	0
Lane Group Flow (vph)	0	791	134	805	1437	0	0	0	0	189	339	0
Confl. Peds. (#/hr)			2									7
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	33%	0%
Turn Type		NA	Perm	Prot	NA					Split	NA	
Protected Phases		2		1	6					4	4	
Permitted Phases			2									
Actuated Green, G (s)		20.8	20.8	13.4	37.2					13.8	13.8	
Effective Green, g (s)		20.8	20.8	13.4	37.2					13.8	13.8	
Actuated g/C Ratio		0.36	0.36	0.23	0.64					0.24	0.24	
Clearance Time (s)		4.0	4.0	3.0	4.0					3.0	3.0	
Vehicle Extension (s)		4.0	4.0	2.0	2.5					2.0	2.0	
Lane Grp Cap (vph)		1167	520	809	2315					390	727	
v/s Ratio Prot		0.24		c0.23	c0.40					c0.12	0.11	
v/s Ratio Perm			0.09									
v/c Ratio		0.68	0.26	1.00	0.62					0.48	0.47	
Uniform Delay, d1		15.8	13.1	22.3	6.2					19.0	18.9	
Progression Factor		1.00	1.00	1.00	1.00					1.00	1.00	
Incremental Delay, d2		1.7	0.4	30.2	0.5					0.3	0.2	
Delay (s)		17.5	13.5	52.5	6.6					19.4	19.1	
Level of Service		B	B	D	A					B	B	
Approach Delay (s)		16.3			23.1			0.0			19.2	
Approach LOS		B			C			A			B	

Intersection Summary				
HCM 2000 Control Delay	20.5	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	58.0	Sum of lost time (s)	10.0	
Intersection Capacity Utilization	72.1%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
26: Highway 101 NB Ramps & Rowland Boulevard 02/15/2018

Movement	EBL2	EBL	EBT	WBT	WBR	WBR2	NBL2	NBL	NBT	NBR	NEL2	NEL
Lane Configurations												
Traffic Volume (vph)	4	99	776	1266	2	517	838	15	2	801	20	20
Future Volume (vph)	4	99	776	1266	2	517	838	15	2	801	20	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	4.0	4.0		4.0	3.5		3.5	3.0		3.5
Lane Util. Factor		1.00	0.95	0.86		0.86	0.95		0.95	0.88		1.00
Frpb, ped/bikes		1.00	1.00	1.00		1.00	1.00		1.00	1.00		1.00
Flpb, ped/bikes		1.00	1.00	1.00		1.00	1.00		1.00	1.00		1.00
Frt		1.00	1.00	0.99		0.85	1.00		1.00	0.85		0.98
Flt Protected		0.95	1.00	1.00		1.00	0.95		0.95	1.00		0.96
Satd. Flow (prot)		1804	3574	4640		1323	1715		1717	2842		1742
Flt Permitted		0.95	1.00	1.00		1.00	0.95		0.95	1.00		0.96
Satd. Flow (perm)		1804	3574	4640		1323	1715		1717	2842		1742
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	4	104	817	1333	2	544	882	16	2	843	21	21
RTOR Reduction (vph)	0	0	0	8	0	214	0	0	0	0	0	0
Lane Group Flow (vph)	0	108	817	1452	0	205	450	0	450	843	0	48
Confl. Peds. (#/hr)					1					8		
Heavy Vehicles (%)	2%	0%	1%	4%	0%	5%	0%	2%	13%	0%	2%	0%
Turn Type	Prot	Prot	NA	NA		Perm	Split	Split	NA	custom	Perm	Prot
Protected Phases	5	5	2	6			8	8	8	1 8		7
Permitted Phases						6					7	
Actuated Green, G (s)		10.2	48.4	49.7		49.7	37.3		37.3	48.8		8.8
Effective Green, g (s)		10.2	48.4	49.7		49.7	37.3		37.3	48.8		8.8
Actuated g/C Ratio		0.08	0.40	0.41		0.41	0.31		0.31	0.41		0.07
Clearance Time (s)		3.0	4.0	4.0		4.0	3.5		3.5			3.5
Vehicle Extension (s)		2.0	2.0	2.0		2.0	2.0		2.0			2.0
Lane Grp Cap (vph)		153	1441	1921		547	533		533	1155		127
v/s Ratio Prot		0.06	0.23	c0.31			c0.26		0.26	c0.30		
v/s Ratio Perm						0.15						0.03
v/c Ratio		0.71	0.57	0.76		0.37	0.84		0.84	0.73		0.38
Uniform Delay, d1		53.4	27.7	30.0		24.4	38.6		38.6	30.0		53.0
Progression Factor		1.00	1.00	0.90		1.28	1.00		1.00	1.00		1.00
Incremental Delay, d2		11.4	1.6	2.4		1.7	11.2		11.2	2.0		0.7
Delay (s)		64.9	29.3	29.4		32.8	49.9		49.9	32.0		53.7
Level of Service		E	C	C		C	D		D	C		D
Approach Delay (s)			33.5	30.2					41.2			53.7
Approach LOS			C	C					D			D

Intersection Summary				
HCM 2000 Control Delay	35.3	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.76			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.0	
Intersection Capacity Utilization	82.1%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
26: Highway 101 NB Ramps & Rowland Boulevard 02/15/2018

Movement	NER
Lane Configurations	
Traffic Volume (vph)	6
Future Volume (vph)	6
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.95
Adj. Flow (vph)	6
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	15%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM Signalized Intersection Capacity Analysis
27: Rowland Boulevard & Rowland Way 02/15/2018

Movement	EBU	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Volume (vph)	6	236	1347	1441	27	38	356
Future Volume (vph)	6	236	1347	1441	27	38	356
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	4.0	4.0		3.2	3.2
Lane Util. Factor		0.97	0.91	0.95		1.00	0.95
Frpb, ped/bikes		1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00		1.00	1.00
Frt		1.00	1.00	1.00		0.88	0.85
Flt Protected		0.95	1.00	1.00		0.99	1.00
Satd. Flow (prot)		3468	5187	3594		1634	1519
Flt Permitted		0.95	1.00	1.00		0.99	1.00
Satd. Flow (perm)		3468	5187	3594		1634	1519
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	6	243	1389	1486	28	39	367
RTOR Reduction (vph)	0	0	0	1	0	147	180
Lane Group Flow (vph)	0	249	1389	1513	0	57	22
Confl. Peds. (#/hr)					12	2	
Heavy Vehicles (%)	0%	1%	0%	0%	7%	2%	1%
Turn Type	Prot	Prot	NA	NA		Prot	Perm
Protected Phases	5	5	2	6		4	
Permitted Phases							4
Actuated Green, G (s)		13.1	99.7	83.1		13.1	13.1
Effective Green, g (s)		13.1	99.7	83.1		13.1	13.1
Actuated g/C Ratio		0.11	0.83	0.69		0.11	0.11
Clearance Time (s)		3.5	4.0	4.0		3.2	3.2
Vehicle Extension (s)		2.0	4.0	4.0		2.0	2.0
Lane Grp Cap (vph)		378	4309	2488		178	165
v/s Ratio Prot		c0.07	0.27	c0.42		c0.03	
v/s Ratio Perm							0.01
v/c Ratio		0.66	0.32	0.61		0.32	0.13
Uniform Delay, d1		51.3	2.3	9.8		49.3	48.3
Progression Factor		1.02	1.17	1.00		1.00	1.00
Incremental Delay, d2		2.5	0.2	1.0		0.4	0.1
Delay (s)		54.7	2.9	10.8		49.7	48.5
Level of Service		D	A	B		D	D
Approach Delay (s)			10.8	10.8		49.1	
Approach LOS			B	B		D	

Intersection Summary			
HCM 2000 Control Delay	15.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.58		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	10.7
Intersection Capacity Utilization	73.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
28: Rowland Boulevard & Vintage Way

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	544	831	2	640	6	839	3	2	4	3	0
Future Volume (vph)	18	544	831	2	640	6	839	3	2	4	3	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0	4.0	3.0	4.0		3.6	3.6			3.2	
Lane Util. Factor	1.00	0.95	0.88	1.00	0.95		0.97	1.00			1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	0.99			1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.94			1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00			0.97	
Satd. Flow (prot)	1805	3539	2842	1805	3568		3502	1768			1847	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00			0.97	
Satd. Flow (perm)	1805	3539	2842	1805	3568		3502	1768			1847	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	19	573	875	2	674	6	883	3	2	4	3	0
RTOR Reduction (vph)	0	0	0	0	1	0	0	1	0	0	0	0
Lane Group Flow (vph)	19	573	875	2	679	0	883	4	0	0	7	0
Confl. Peds. (#/hr)			9	9		13			11			
Confl. Bikes (#/hr)			2			2						
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Prot	NA	pt+ov	Prot	NA		Split	NA		Split	NA	
Protected Phases	5	2	2 3	1	6		3	3		4	4	
Permitted Phases												
Actuated Green, G (s)	5.4	49.6	105.0	2.8	47.0		51.4	51.4			2.4	
Effective Green, g (s)	5.4	49.6	105.0	2.8	47.0		51.4	51.4			2.4	
Actuated g/C Ratio	0.05	0.41	0.88	0.02	0.39		0.43	0.43			0.02	
Clearance Time (s)	3.0	4.0		3.0	4.0		3.6	3.6			3.2	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		3.0	3.0			2.0	
Lane Grp Cap (vph)	81	1462	2486	42	1397		1500	757			36	
v/s Ratio Prot	0.01	0.16	c0.31	0.00	c0.19		c0.25	0.00			c0.00	
v/s Ratio Perm												
v/c Ratio	0.23	0.39	0.35	0.05	0.49		0.59	0.01			0.19	
Uniform Delay, d1	55.3	24.6	1.4	57.3	27.4		26.2	19.7			57.8	
Progression Factor	1.17	1.17	0.96	1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.5	0.8	0.4	0.2	1.2		1.7	0.0			1.0	
Delay (s)	65.4	29.6	1.7	57.5	28.6		27.9	19.7			58.8	
Level of Service	E	C	A	E	C		C	B			E	
Approach Delay (s)		13.4			28.7			27.9			58.8	
Approach LOS		B			C			C			E	

Intersection Summary				
HCM 2000 Control Delay	21.2	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.53			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.8	
Intersection Capacity Utilization	60.6%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
29: Novato Blvd #3 & Sunset Parkway

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	210	19	35	32	12	38	46	304	54	36	333	228
Future Volume (vph)	210	19	35	32	12	38	46	304	54	36	333	228
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.0		3.5	3.5		3.5	4.9		3.5	4.6	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.98		1.00	0.98		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.90		1.00	0.89		1.00	0.98		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	1674		1805	1644		1805	1835		1805	1777	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1787	1674		1805	1644		1805	1835		1805	1777	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	221	20	37	34	13	40	48	320	57	38	351	240
RTOR Reduction (vph)	0	30	0	0	36	0	0	5	0	0	19	0
Lane Group Flow (vph)	221	27	0	34	17	0	48	372	0	38	572	0
Confl. Peds. (#/hr)			11			6			3			
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	1%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases												
Actuated Green, G (s)	13.1	15.6		5.2	8.2		5.2	38.3		5.2	38.6	
Effective Green, g (s)	13.1	15.6		5.2	8.2		5.2	38.3		5.2	38.6	
Actuated g/C Ratio	0.16	0.19		0.06	0.10		0.06	0.48		0.06	0.48	
Clearance Time (s)	3.5	4.0		3.5	3.5		3.5	4.9		3.5	4.6	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	291	325		117	168		117	876		117	855	
v/s Ratio Prot	c0.12	c0.02		0.02	0.01		c0.03	0.20		0.02	c0.32	
v/s Ratio Perm												
v/c Ratio	0.76	0.08		0.29	0.10		0.41	0.42		0.32	0.67	
Uniform Delay, d1	32.0	26.4		35.7	32.7		36.0	13.7		35.8	15.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	9.7	0.0		0.5	0.1		0.9	1.5		0.6	4.1	
Delay (s)	41.7	26.5		36.2	32.8		36.9	15.2		36.4	20.0	
Level of Service	D	C		D	C		D	B		D	C	
Approach Delay (s)		38.6			34.1			17.7			21.0	
Approach LOS		D			C			B			C	

Intersection Summary				
HCM 2000 Control Delay	24.3	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.60			
Actuated Cycle Length (s)	80.2	Sum of lost time (s)	15.9	
Intersection Capacity Utilization	65.0%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM 2010 AWSC
30: Redwood Blvd & Novato Blvd #3 02/15/2018

Intersection	
Intersection Delay, s/veh	49.6
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	46	274	74	74	370	114	121	14	141	88	11	48
Future Vol, veh/h	46	274	74	74	370	114	121	14	141	88	11	48
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	1	2	1	1	2	1	1	1	1	1	1	1
Mvmt Flow	48	288	78	78	389	120	127	15	148	93	12	51
Number of Lanes	1	1	0	1	1	0	1	1	1	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	3	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	2	2	2
HCM Control Delay	34.4	86.3	15.7	14.9
HCM LOS	D	F	C	B

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	100%	0%	0%	79%	0%	76%	0%	19%
Vol Right, %	0%	0%	100%	0%	21%	0%	24%	0%	81%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	121	14	141	46	348	74	484	88	59
LT Vol	121	0	0	46	0	74	0	88	0
Through Vol	0	14	0	0	274	0	370	0	11
RT Vol	0	0	141	0	74	0	114	0	48
Lane Flow Rate	127	15	148	48	366	78	509	93	62
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.326	0.036	0.328	0.115	0.805	0.182	1.096	0.249	0.148
Departure Headway (Hd)	9.586	9.067	8.341	8.909	8.261	8.406	7.744	10.096	8.975
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	377	397	433	405	440	429	474	358	402
Service Time	7.286	6.767	6.041	6.609	5.961	6.106	5.444	7.796	6.675
HCM Lane V/C Ratio	0.337	0.038	0.342	0.119	0.832	0.182	1.074	0.26	0.154
HCM Control Delay	16.9	12.1	15.1	12.8	37.2	13	97.5	16.1	13.2
HCM Lane LOS	C	B	C	B	E	B	F	C	B
HCM 95th-tile Q	1.4	0.1	1.4	0.4	7.3	0.7	16.9	1	0.5

HCM Signalized Intersection Capacity Analysis
30: Redwood Blvd & Novato Blvd #3 02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	46	274	74	74	370	114	121	14	141	88	11	48
Future Volume (vph)	46	274	74	74	370	114	121	14	141	88	11	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	16	12	16	16	12	12	12	12	12	12
Total Lost time (s)	3.5	4.0		3.5	4.0		3.5	4.0	4.0	3.5	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	0.96		1.00	1.00	0.85	1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1787	2048		1787	2041		1787	1881	1599	1787	1653	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1787	2048		1787	2041		1787	1881	1599	1787	1653	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	48	288	78	78	389	120	127	15	148	93	12	51
RTOR Reduction (vph)	0	9	0	0	11	0	0	0	125	0	46	0
Lane Group Flow (vph)	48	357	0	78	498	0	127	15	23	93	17	0
Heavy Vehicles (%)	1%	2%	1%	1%	2%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	2.6	20.0		4.2	21.6		9.6	8.4	8.4	6.4	5.2	
Effective Green, g (s)	2.6	20.0		4.2	21.6		9.6	8.4	8.4	6.4	5.2	
Actuated g/C Ratio	0.05	0.37		0.08	0.40		0.18	0.16	0.16	0.12	0.10	
Clearance Time (s)	3.5	4.0		3.5	4.0		3.5	4.0	4.0	3.5	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	86	758		138	816		317	292	248	211	159	
v/s Ratio Prot	0.03	0.17		c0.04	c0.24		c0.07	0.01		0.05	0.01	
v/s Ratio Perm									c0.01			
v/c Ratio	0.56	0.47		0.57	0.61		0.40	0.05	0.09	0.44	0.11	
Uniform Delay, d1	25.1	13.0		24.0	12.9		19.7	19.4	19.5	22.1	22.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	7.6	0.5		5.2	1.3		0.8	0.1	0.2	1.5	0.3	
Delay (s)	32.8	13.4		29.2	14.2		20.5	19.5	19.7	23.6	22.6	
Level of Service	C	B		C	B		C	B	B	C	C	
Approach Delay (s)		15.7			16.2			20.0			23.2	
Approach LOS		B			B			C			C	

Intersection Summary				
HCM 2000 Control Delay	17.6	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.49			
Actuated Cycle Length (s)	54.0	Sum of lost time (s)	15.0	
Intersection Capacity Utilization	53.1%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

MOVEMENT SUMMARY

Site: 30 [PM Cumulative]

Novato Boulevard/Redwood Boulevard
PM Cumulative with Project

Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NB Redwood Boulevard											
3	L2	127	2.0	0.336	7.9	LOS A	1.6	41.5	0.60	0.55	32.3
8	T1	15	2.0	0.336	7.9	LOS A	1.6	41.5	0.60	0.55	32.3
18	R2	148	2.0	0.336	7.9	LOS A	1.6	41.5	0.60	0.55	31.5
Approach		291	2.0	0.336	7.9	LOS A	1.6	41.5	0.60	0.55	31.9
East: WB Novato Blvd											
1	L2	78	2.0	0.529	9.5	LOS A	3.7	93.5	0.55	0.39	32.4
6	T1	389	2.0	0.529	9.5	LOS A	3.7	93.5	0.55	0.39	32.4
16	R2	120	2.0	0.529	9.5	LOS A	3.7	93.5	0.55	0.39	31.5
Approach		587	2.0	0.529	9.5	LOS A	3.7	93.5	0.55	0.39	32.2
North: SB Redwood Boulevard											
7	L2	93	2.0	0.212	7.3	LOS A	0.9	22.7	0.61	0.60	32.2
4	T1	12	2.0	0.212	7.3	LOS A	0.9	22.7	0.61	0.60	32.2
14	R2	51	2.0	0.212	7.3	LOS A	0.9	22.7	0.61	0.60	31.4
Approach		155	2.0	0.212	7.3	LOS A	0.9	22.7	0.61	0.60	32.0
West: EB Novato Blvd											
5	L2	48	2.0	0.287	5.7	LOS A	1.4	35.3	0.37	0.24	34.2
2	T1	288	2.0	0.287	5.7	LOS A	1.4	35.3	0.37	0.24	34.2
12	R2	78	2.0	0.066	3.6	LOS A	0.3	6.6	0.30	0.17	34.5
Approach		415	2.0	0.287	5.3	LOS A	1.4	35.3	0.35	0.23	34.2
All Vehicles		1447	2.0	0.529	7.7	LOS A	3.7	93.5	0.51	0.40	32.7

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: N:\AAA\MAX\NOV\126NOV\SIDRA\Novato-Redwood.sip7

HCM Signalized Intersection Capacity Analysis
31: Alameda Del Prado & Ignacio Blvd 02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	459	81	348	742	36	102	4	170	29	5	1
Future Volume (vph)	11	459	81	348	742	36	102	4	170	29	5	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.6	3.6	3.0	3.6			3.5	3.5		3.7	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00			1.00	0.98		1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00			0.99	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	0.99			1.00	0.85		1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00		0.96	
Satd. Flow (prot)	1770	3610	1573	1900	3585			1784	1589		1811	
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.76	1.00		0.75	
Satd. Flow (perm)	1770	3610	1573	1805	3585			1413	1589		1417	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	12	483	85	366	781	38	107	4	179	31	5	1
RTOR Reduction (vph)	0	0	31	0	2	0	0	0	152	0	1	0
Lane Group Flow (vph)	12	483	54	366	817	0	0	111	27	0	36	0
Confl. Peds. (#/hr)			4				7		4	4		7
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2				8		8	4		
Actuated Green, G (s)	1.2	47.4	47.4	27.4	73.6			15.1	15.1		14.9	
Effective Green, g (s)	1.2	47.4	47.4	27.4	73.6			15.1	15.1		14.9	
Actuated g/C Ratio	0.01	0.47	0.47	0.27	0.74			0.15	0.15		0.15	
Clearance Time (s)	3.0	3.6	3.6	3.0	3.6			3.5	3.5		3.7	
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0			2.0	2.0		2.0	
Lane Grp Cap (vph)	21	1711	745	520	2638			213	239		211	
v/s Ratio Prot	c0.01	0.13		c0.19	c0.23							
v/s Ratio Perm			0.03					c0.08	0.02		0.03	
v/c Ratio	0.57	0.28	0.07	0.70	0.31			0.52	0.11		0.17	
Uniform Delay, d1	49.1	16.0	14.3	32.7	4.5			39.1	36.7		37.2	
Progression Factor	1.00	1.00	1.00	0.74	0.74			1.00	1.00		1.00	
Incremental Delay, d2	21.2	0.4	0.2	3.2	0.3			1.1	0.1		0.1	
Delay (s)	70.4	16.4	14.5	27.2	3.6			40.2	36.7		37.3	
Level of Service	E	B	B	C	A			D	D		D	
Approach Delay (s)		17.2			10.9			38.1			37.3	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	16.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.3
Intersection Capacity Utilization	69.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
32: US 101 SB Off Ramp/Enfrente Rd & Ignacio Blvd/Ignacio Blvd #3 02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	403	267	668	821	145	0	0	813	201	92	308
Future Volume (vph)	35	403	267	668	821	145	0	0	813	201	92	308
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			2%			0%	
Total Lost time (s)	3.0	8.0	8.0	4.0	5.0				4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95				0.88		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.96	1.00	0.99				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	1.00	0.85	1.00	0.98				0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00				1.00		0.97	1.00
Satd. Flow (prot)	1805	3610	1550	1770	3500				2759		1809	1578
Flt Permitted	0.95	1.00	1.00	0.95	1.00				1.00		0.97	1.00
Satd. Flow (perm)	1805	3610	1550	1770	3500				2759		1809	1578
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)	36	420	278	696	855	151	0	0	847	209	96	321
RTOR Reduction (vph)	0	0	205	0	11	0	0	0	389	0	0	240
Lane Group Flow (vph)	36	420	73	696	995	0	0	0	458	0	305	81
Confl. Peds. (#/hr)			7			20						1
Confl. Bikes (#/hr)						3						
Heavy Vehicles (%)	0%	0%	0%	2%	0%	0%	0%	0%	2%	0%	5%	1%
Turn Type	Prot	NA	Perm	Prot	NA				Over	Split	NA	Perm
Protected Phases	5	2		1	6				1	7	7	
Permitted Phases			2									7
Actuated Green, G (s)	6.6	26.3	26.3	35.2	58.9				35.2		22.5	22.5
Effective Green, g (s)	6.6	26.3	26.3	35.2	58.9				35.2		22.5	22.5
Actuated g/C Ratio	0.07	0.26	0.26	0.35	0.59				0.35		0.22	0.22
Clearance Time (s)	3.0	8.0	8.0	4.0	5.0				4.0		4.0	4.0
Vehicle Extension (s)	2.0	2.5	2.5	3.0	4.0				3.0		2.5	2.5
Lane Grp Cap (vph)	119	949	407	623	2061				971		407	355
v/s Ratio Prot	0.02	c0.12		c0.39	c0.28				0.17		c0.17	
v/s Ratio Perm			0.05									0.05
v/c Ratio	0.30	0.44	0.18	1.12	0.48				0.47		0.75	0.23
Uniform Delay, d1	44.5	30.7	28.5	32.4	11.8				25.2		36.1	31.7
Progression Factor	0.98	0.69	0.44	0.82	0.74				1.00		1.00	1.00
Incremental Delay, d2	0.5	1.5	0.9	62.8	0.4				0.4		7.0	0.2
Delay (s)	44.2	22.7	13.4	89.3	9.1				25.5		43.1	31.9
Level of Service	D	C	B	F	A				C		D	C
Approach Delay (s)		20.3			41.9			25.5			37.4	
Approach LOS		C			D			C			D	

Intersection Summary				
HCM 2000 Control Delay	33.5	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.83			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	83.9%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
32: US 101 SB Off Ramp/Enfrente Rd & Ignacio Blvd/Ignacio Blvd #3 02/16/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	403	267	668	821	145	0	0	813	201	92	308
Future Volume (vph)	35	403	267	668	821	145	0	0	813	201	92	308
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			2%			0%	
Total Lost time (s)	3.0	8.0	8.0	4.0	5.0				4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95				0.88		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.96	1.00	0.99				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	1.00	0.85	1.00	0.98				0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00				1.00		0.97	1.00
Satd. Flow (prot)	1805	3610	1550	1770	3500				2759		1809	1578
Flt Permitted	0.95	1.00	1.00	0.95	1.00				1.00		0.97	1.00
Satd. Flow (perm)	1805	3610	1550	1770	3500				2759		1809	1578
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)	36	420	278	696	855	151	0	0	847	209	96	321
RTOR Reduction (vph)	0	0	205	0	11	0	0	0	389	0	0	240
Lane Group Flow (vph)	36	420	73	696	995	0	0	0	458	0	305	81
Confl. Peds. (#/hr)			7			20						1
Confl. Bikes (#/hr)						3						
Heavy Vehicles (%)	0%	0%	0%	2%	0%	0%	0%	0%	2%	0%	5%	1%
Turn Type	Prot	NA	Perm	Prot	NA				Over	Split	NA	Perm
Protected Phases	5	2		1	6				1	7	7	
Permitted Phases			2									7
Actuated Green, G (s)	6.6	26.3	26.3	35.2	58.9				35.2		22.5	22.5
Effective Green, g (s)	6.6	26.3	26.3	35.2	58.9				35.2		22.5	22.5
Actuated g/C Ratio	0.07	0.26	0.26	0.35	0.59				0.35		0.22	0.22
Clearance Time (s)	3.0	8.0	8.0	4.0	5.0				4.0		4.0	4.0
Vehicle Extension (s)	2.0	2.5	2.5	3.0	4.0				3.0		2.5	2.5
Lane Grp Cap (vph)	119	949	407	623	2061				971		407	355
v/s Ratio Prot	0.02	c0.12		c0.39	c0.28				0.17		c0.17	
v/s Ratio Perm			0.05									0.05
v/c Ratio	0.30	0.44	0.18	1.12	0.48				0.47		0.75	0.23
Uniform Delay, d1	44.5	30.7	28.5	32.4	11.8				25.2		36.1	31.7
Progression Factor	0.93	0.65	0.39	0.83	0.73				1.00		1.00	1.00
Incremental Delay, d2	0.5	1.5	0.9	62.8	0.4				0.4		7.0	0.2
Delay (s)	42.1	21.6	12.2	89.6	8.9				25.5		43.1	31.9
Level of Service	D	C	B	F	A				C		D	C
Approach Delay (s)		19.0			41.9			25.5			37.4	
Approach LOS		B			D			C			D	

Intersection Summary				
HCM 2000 Control Delay	33.3	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.83			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	83.9%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
33: Nave Dr & Ignacio Blvd #3/Bel Marin Keys Blvd #3

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	379	1044	134	769	778	870	769	276	0	0	0
Future Volume (vph)	0	379	1044	134	769	778	870	769	276	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.6	3.0	4.0		4.6	4.6	3.0			
Lane Util. Factor		0.95	1.00	1.00	0.95		0.91	0.91	1.00			
Frpb, ped/bikes		1.00	0.99	1.00	0.99		1.00	1.00	0.99			
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00			
Frt		1.00	0.85	1.00	0.92		1.00	1.00	0.85			
Flt Protected		1.00	1.00	0.95	1.00		0.95	0.98	1.00			
Satd. Flow (prot)		3539	1605	1805	3250		1643	3382	1584			
Flt Permitted		1.00	1.00	0.95	1.00		0.95	0.98	1.00			
Satd. Flow (perm)		3539	1605	1805	3250		1643	3382	1584			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	399	1099	141	809	819	916	809	291	0	0	0
RTOR Reduction (vph)	0	0	72	0	39	0	0	0	105	0	0	0
Lane Group Flow (vph)	0	399	1027	141	1589	0	559	1166	186	0	0	0
Confl. Peds. (#/hr)			1			1			1			
Heavy Vehicles (%)	0%	2%	0%	0%	2%	2%	0%	1%	1%	0%	0%	0%
Turn Type		NA	pm+ov	Prot	NA		Split	NA	pm+ov			
Protected Phases		2	3	1	6		3	3	1			
Permitted Phases			2						3			
Actuated Green, G (s)		35.4	75.6	12.8	51.2		40.2	40.2	53.0			
Effective Green, g (s)		35.4	75.6	12.8	51.2		40.2	40.2	53.0			
Actuated g/C Ratio		0.35	0.76	0.13	0.51		0.40	0.40	0.53			
Clearance Time (s)		4.0	4.6	3.0	4.0		4.6	4.6	3.0			
Vehicle Extension (s)		4.0	2.0	2.0	4.0		2.0	2.0	2.0			
Lane Grp Cap (vph)		1252	1213	231	1664		660	1359	839			
v/s Ratio Prot		0.11	0.34	0.08	c0.49		0.34	c0.34	0.03			
v/s Ratio Perm			0.30						0.09			
v/c Ratio		0.32	0.85	0.61	0.95		0.85	0.86	0.22			
Uniform Delay, d1		23.5	8.3	41.2	23.3		27.1	27.3	12.5			
Progression Factor		1.10	1.01	1.00	1.00		1.00	1.00	1.00			
Incremental Delay, d2		0.6	4.6	3.3	13.7		9.5	5.4	0.0			
Delay (s)		26.4	13.0	44.6	37.0		36.6	32.7	12.6			
Level of Service		C	B	D	D		D	C	B			
Approach Delay (s)		16.5			37.6			30.9			0.0	
Approach LOS		B			D			C			A	

Intersection Summary				
HCM 2000 Control Delay	29.0	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.94			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.6	
Intersection Capacity Utilization	84.5%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
34: Bel Marin Keys Blvd #3 & Commercial Blvd

02/16/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	0	40	292	1	29	48	562	82	33	1448	7
Future Volume (vph)	3	0	40	292	1	29	48	562	82	33	1448	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	3.0	3.9		3.0	3.5	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			1.00	0.99	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.87			1.00	0.85	1.00	0.98		1.00	1.00	
Flt Protected		1.00			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1631			1754	1396	1805	3456		1805	3537	
Flt Permitted		0.98			0.69	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1608			1275	1396	1805	3456		1805	3537	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	3	0	44	324	1	32	53	624	91	37	1609	8
RTOR Reduction (vph)	0	32	0	0	0	22	0	12	0	0	1	0
Lane Group Flow (vph)	0	15	0	0	325	10	53	703	0	37	1616	0
Confl. Peds. (#/hr)	3		2	2		3			3			
Heavy Vehicles (%)	2%	0%	0%	3%	0%	14%	0%	2%	3%	0%	2%	0%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		23.2			23.2	23.2	3.9	37.3		3.6	37.4	
Effective Green, g (s)		23.2			23.2	23.2	3.9	37.3		3.6	37.4	
Actuated g/C Ratio		0.31			0.31	0.31	0.05	0.50		0.05	0.50	
Clearance Time (s)		4.0			4.0	4.0	3.0	3.9		3.0	3.5	
Vehicle Extension (s)		3.0			3.0	3.0	2.5	3.0		2.5	4.0	
Lane Grp Cap (vph)		497			394	431	93	1718		86	1763	
v/s Ratio Prot							c0.03	0.20		0.02	c0.46	
v/s Ratio Perm		0.01			c0.25	0.01						
v/c Ratio		0.03			0.82	0.02	0.57	0.41		0.43	0.92	
Uniform Delay, d1		18.1			24.0	18.0	34.7	11.9		34.7	17.4	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.09	1.02	
Incremental Delay, d2		0.0			13.1	0.0	6.4	0.7		1.4	5.5	
Delay (s)		18.1			37.1	18.0	41.1	12.6		39.3	23.2	
Level of Service		B			D	B	D	B		D	C	
Approach Delay (s)		18.1			35.4			14.6			23.6	
Approach LOS		B			D			B			C	

Intersection Summary				
HCM 2000 Control Delay	22.5	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.87			
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	10.9	
Intersection Capacity Utilization	69.9%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
35: Bel Marin Keys Blvd #3 & Hamilton Dr/Digital Dr

02/16/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	7	162	630	4	14	47	404	132	6	732	2
Future Volume (vph)	5	7	162	630	4	14	47	404	132	6	732	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	3.5	3.5	3.5		3.0	4.0		3.0	4.0	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.98	1.00	0.99		1.00	0.99		1.00	1.00	
Flpb, ped/bikes		1.00	1.00	0.99	1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85	1.00	0.88		1.00	0.96		1.00	1.00	
Flt Protected		0.98	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1864	1522	1739	1658		1770	3378		1805	3538	
Flt Permitted		0.96	1.00	0.75	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1822	1522	1371	1658		1770	3378		1805	3538	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	8	176	685	4	15	51	439	143	7	796	2
RTOR Reduction (vph)	0	0	104	0	9	0	0	36	0	0	0	0
Lane Group Flow (vph)	0	13	72	685	10	0	51	546	0	7	798	0
Confl. Peds. (#/hr)	1		10	10		1			2			8
Confl. Bikes (#/hr)									5			5
Heavy Vehicles (%)	0%	0%	4%	3%	0%	0%	2%	2%	3%	0%	2%	0%
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8								
Actuated Green, G (s)		30.5	30.5	30.5	30.5		5.4	32.2		1.8	28.6	
Effective Green, g (s)		30.5	30.5	30.5	30.5		5.4	32.2		1.8	28.6	
Actuated g/C Ratio		0.41	0.41	0.41	0.41		0.07	0.43		0.02	0.38	
Clearance Time (s)		3.5	3.5	3.5	3.5		3.0	4.0		3.0	4.0	
Vehicle Extension (s)		2.0	2.0	2.5	2.5		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)		740	618	557	674		127	1450		43	1349	
v/s Ratio Prot					0.01		c0.03	0.16		0.00	c0.23	
v/s Ratio Perm		0.01	0.05	c0.50								
v/c Ratio		0.02	0.12	1.23	0.01		0.40	0.38		0.16	0.59	
Uniform Delay, d1		13.3	13.9	22.2	13.3		33.3	14.6		35.9	18.5	
Progression Factor		1.00	1.00	1.00	1.00		0.77	1.63		1.00	1.00	
Incremental Delay, d2		0.0	0.0	118.5	0.0		0.7	0.7		0.7	1.9	
Delay (s)		13.3	13.9	140.8	13.3		26.3	24.5		36.5	20.4	
Level of Service		B	B	F	B		C	C		D	C	
Approach Delay (s)		13.8			137.3			24.7			20.6	
Approach LOS		B			F			C			C	

Intersection Summary				
HCM 2000 Control Delay	56.4	HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio	0.88			
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	10.5	
Intersection Capacity Utilization	80.0%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
35: Bel Marin Keys Blvd #3 & Hamilton Dr/Digital Dr

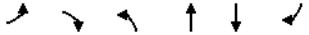
02/16/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	7	162	630	4	14	47	404	132	6	732	2
Future Volume (vph)	5	7	162	630	4	14	47	404	132	6	732	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	3.5	3.5	3.5		3.0	4.5		3.0	4.5	
Lane Util. Factor		1.00	1.00	0.95	0.95		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.99	1.00	1.00		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	0.85	1.00	0.99		1.00	0.96		1.00	1.00	
Flt Protected		0.98	1.00	0.95	0.95		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1864	1533	1665	1664		1770	3381		1805	3538	
Flt Permitted		0.98	1.00	0.95	0.95		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1864	1533	1665	1664		1770	3381		1805	3538	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	8	176	685	4	15	51	439	143	7	796	2
RTOR Reduction (vph)	0	0	120	0	1	0	0	23	0	0	0	0
Lane Group Flow (vph)	0	13	56	356	347	0	51	559	0	7	798	0
Confl. Peds. (#/hr)			1			1			2			8
Heavy Vehicles (%)	0%	0%	4%	3%	0%	0%	2%	2%	3%	0%	2%	0%
Turn Type	Split	NA	Perm	Split	NA		Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)		12.1	12.1	25.6	25.6		5.0	47.0		0.8	42.8	
Effective Green, g (s)		12.1	12.1	25.6	25.6		5.0	47.0		0.8	42.8	
Actuated g/C Ratio		0.12	0.12	0.26	0.26		0.05	0.47		0.01	0.43	
Clearance Time (s)		3.5	3.5	3.5	3.5		3.0	4.5		3.0	4.5	
Vehicle Extension (s)		2.0	2.0	2.5	2.5		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)		225	185	426	425		88	1589		14	1514	
v/s Ratio Prot		0.01		c0.21	0.21		c0.03	0.17		0.00	c0.23	
v/s Ratio Perm			c0.04									
v/c Ratio		0.06	0.31	0.84	0.82		0.58	0.35		0.50	0.53	
Uniform Delay, d1		38.9	40.1	35.2	35.0		46.5	16.8		49.4	21.1	
Progression Factor		1.00	1.00	1.00	1.00		0.59	0.28		1.00	1.00	
Incremental Delay, d2		0.0	0.3	13.0	11.2		5.4	0.6		9.9	1.3	
Delay (s)		38.9	40.5	48.3	46.2		32.6	5.3		59.3	22.4	
Level of Service		D	D	D	D		C	A		E	C	
Approach Delay (s)		40.4			47.2			7.5			22.8	
Approach LOS		D			D			A			C	

Intersection Summary				
HCM 2000 Control Delay	27.4	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.59			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.5	
Intersection Capacity Utilization	59.4%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
36: Nave Dr & US 101 NB Off Ramp

02/15/2018



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	730	233	0	1197	922	246
Future Volume (vph)	730	233	0	1197	922	246
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		5.0	5.0	
Lane Util. Factor	0.97	1.00		0.95	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	0.97	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3467	1563		3574	3469	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3467	1563		3574	3469	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	745	238	0	1221	941	251
RTOR Reduction (vph)	0	36	0	0	35	0
Lane Group Flow (vph)	745	202	0	1221	1157	0
Confl. Peds. (#/hr)		1				
Heavy Vehicles (%)	1%	2%	0%	1%	1%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	31.0	31.0		31.0	31.0	
Effective Green, g (s)	31.0	31.0		31.0	31.0	
Actuated g/C Ratio	0.44	0.44		0.44	0.44	
Clearance Time (s)	3.0	3.0		5.0	5.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	1535	692		1582	1536	
v/s Ratio Prot	c0.21			c0.34	0.33	
v/s Ratio Perm		0.13				
v/c Ratio	0.49	0.29		0.77	0.75	
Uniform Delay, d1	13.8	12.5		16.5	16.3	
Progression Factor	1.00	1.00		0.51	1.00	
Incremental Delay, d2	1.1	1.1		2.7	3.5	
Delay (s)	14.9	13.6		11.0	19.8	
Level of Service	B	B		B	B	
Approach Delay (s)	14.6			11.0	19.8	
Approach LOS	B			B	B	

Intersection Summary				
HCM 2000 Control Delay	15.1	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.63			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	63.3%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
37: Nave Dr & Hamilton Center

02/15/2018

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	120	45	921	133	147	813
Future Volume (vph)	120	45	921	133	147	813
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.2	3.2	4.4		3.0	4.4
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.98		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	1615	1862		1770	1881
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1805	1615	1862		1770	1881
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	125	47	959	139	153	847
RTOR Reduction (vph)	0	43	6	0	0	0
Lane Group Flow (vph)	125	4	1092	0	153	847
Confl. Peds. (#/hr)				2		
Heavy Vehicles (%)	0%	0%	0%	0%	2%	1%
Turn Type	Prot	Perm	NA		Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8				
Actuated Green, G (s)	6.5	6.5	44.8		8.1	55.9
Effective Green, g (s)	6.5	6.5	44.8		8.1	55.9
Actuated g/C Ratio	0.09	0.09	0.64		0.12	0.80
Clearance Time (s)	3.2	3.2	4.4		3.0	4.4
Vehicle Extension (s)	1.0	1.0	1.0		1.0	1.0
Lane Grp Cap (vph)	167	149	1191		204	1502
v/s Ratio Prot	c0.07		c0.59		c0.09	0.45
v/s Ratio Perm		0.00				
v/c Ratio	0.75	0.03	0.92		0.75	0.56
Uniform Delay, d1	31.0	28.9	11.0		30.0	2.6
Progression Factor	1.00	1.00	0.86		1.08	0.91
Incremental Delay, d2	14.8	0.0	10.5		9.6	1.1
Delay (s)	45.7	28.9	20.0		42.1	3.5
Level of Service	D	C	C		D	A
Approach Delay (s)	41.1		20.0			9.4
Approach LOS	D		C			A

Intersection Summary				
HCM 2000 Control Delay	16.9	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.87			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	10.6	
Intersection Capacity Utilization	81.7%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
38: Nave Dr & Hamilton Pkwy

02/15/2018

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	92	393	536	55	339	453
Future Volume (vph)	92	393	536	55	339	453
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.2	3.2	4.4	4.4	3.0	4.4
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1599	1900	1578	1787	1850
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1599	1900	1578	1787	1900
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	97	414	564	58	357	477
RTOR Reduction (vph)	0	360	0	15	0	0
Lane Group Flow (vph)	97	54	564	43	357	477
Confl. Peds. (#/hr)				2		
Heavy Vehicles (%)	2%	1%	0%	0%	1%	0%
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Actuated Green, G (s)	9.2	9.2	27.1	27.1	23.1	53.2
Effective Green, g (s)	9.2	9.2	27.1	27.1	23.1	53.2
Actuated g/C Ratio	0.13	0.13	0.39	0.39	0.33	0.76
Clearance Time (s)	3.2	3.2	4.4	4.4	3.0	4.4
Vehicle Extension (s)	2.0	2.0	3.0	3.0	2.0	3.0
Lane Grp Cap (vph)	232	210	735	610	589	1406
v/s Ratio Prot	c0.05		c0.30		c0.20	0.26
v/s Ratio Perm		0.03		0.03		
v/c Ratio	0.42	0.26	0.77	0.07	0.61	0.34
Uniform Delay, d1	27.9	27.3	18.7	13.5	19.6	2.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	0.23
Incremental Delay, d2	0.4	0.2	7.5	0.2	1.0	0.6
Delay (s)	28.4	27.6	26.2	13.7	20.6	1.2
Level of Service	C	C	C	B	C	A
Approach Delay (s)	27.7		25.1			9.5
Approach LOS	C		C			A

Intersection Summary				
HCM 2000 Control Delay	19.2	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.65			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	10.6	
Intersection Capacity Utilization	62.4%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
39: Nave Dr & Main Gate Dr

02/15/2018

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	354	283	294	319	285	274
Future Volume (vph)	354	283	294	319	285	274
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	4.1	4.1	3.0	4.4
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1805	1615	1900	1615	1805	1881
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1805	1615	1900	1615	1805	1881
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	373	298	309	336	300	288
RTOR Reduction (vph)	0	211	0	248	0	0
Lane Group Flow (vph)	373	87	309	88	300	288
Heavy Vehicles (%)	0%	0%	0%	0%	0%	1%
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Actuated Green, G (s)	14.8	14.8	13.2	13.2	12.4	28.3
Effective Green, g (s)	14.8	14.8	13.2	13.2	12.4	28.3
Actuated g/C Ratio	0.29	0.29	0.26	0.26	0.25	0.56
Clearance Time (s)	3.0	3.0	4.1	4.1	3.0	4.4
Vehicle Extension (s)	2.0	2.0	1.0	1.0	1.0	1.0
Lane Grp Cap (vph)	528	473	496	422	443	1054
v/s Ratio Prot	c0.21		c0.16		c0.17	0.15
v/s Ratio Perm		0.05		0.05		
v/c Ratio	0.71	0.18	0.62	0.21	0.68	0.27
Uniform Delay, d1	15.9	13.3	16.5	14.6	17.2	5.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.5	0.1	1.8	0.1	3.2	0.1
Delay (s)	19.4	13.4	18.2	14.7	20.5	5.8
Level of Service	B	B	B	B	C	A
Approach Delay (s)	16.8		16.4			13.3
Approach LOS	B		B			B

Intersection Summary				
HCM 2000 Control Delay	15.5	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.67			
Actuated Cycle Length (s)	50.5	Sum of lost time (s)	10.1	
Intersection Capacity Utilization	61.0%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
40: Nave Dr & Bolling Dr

02/15/2018

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	220	63	563	346	98	575
Future Volume (vph)	220	63	563	346	98	575
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	4.1		3.0	3.5
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	0.97	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.95		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1787	1569	1791		1805	1881
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1787	1569	1791		1805	1881
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	229	66	586	360	102	599
RTOR Reduction (vph)	0	52	23	0	0	0
Lane Group Flow (vph)	229	14	923	0	102	599
Confl. Peds. (#/hr)		6				
Heavy Vehicles (%)	1%	0%	1%	0%	0%	1%
Turn Type	Prot	Perm	NA		Prot	NA
Protected Phases	4		6		5	2
Permitted Phases		4				
Actuated Green, G (s)	14.1	14.1	37.6		6.9	48.1
Effective Green, g (s)	14.1	14.1	37.6		6.9	48.1
Actuated g/C Ratio	0.21	0.21	0.55		0.10	0.70
Clearance Time (s)	3.0	3.0	4.1		3.0	3.5
Vehicle Extension (s)	2.0	2.0	2.0		2.0	2.0
Lane Grp Cap (vph)	366	322	980		181	1316
v/s Ratio Prot	c0.13		c0.52		c0.06	0.32
v/s Ratio Perm		0.01				
v/c Ratio	0.63	0.04	0.94		0.56	0.46
Uniform Delay, d1	24.9	21.9	14.5		29.5	4.5
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	2.4	0.0	16.3		2.4	0.1
Delay (s)	27.3	21.9	30.8		31.8	4.6
Level of Service	C	C	C		C	A
Approach Delay (s)	26.1		30.8			8.6
Approach LOS	C		C			A

Intersection Summary				
HCM 2000 Control Delay	22.1	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.82			
Actuated Cycle Length (s)	68.7	Sum of lost time (s)	10.1	
Intersection Capacity Utilization	81.9%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

HCM 2010 AWSC
41: Alameda Del Prado & Clay Ct/Nave Dr

02/15/2018

Intersection	
Intersection Delay, s/veh	19.9
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	8	11	1	107	21	759	0	70	39	273	71	13
Future Vol, veh/h	8	11	1	107	21	759	0	70	39	273	71	13
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	11	1	110	22	782	0	72	40	281	73	13
Number of Lanes	0	1	0	0	1	1	0	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	2	1
HCM Control Delay	10.8	21.8	12	18
HCM LOS	B	C	B	C

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	0%	40%	24%	0%	100%	0%
Vol Thru, %	64%	55%	5%	0%	0%	85%
Vol Right, %	36%	5%	72%	100%	0%	15%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	109	20	454	433	273	84
LT Vol	0	8	107	0	273	0
Through Vol	70	11	21	0	0	71
RT Vol	39	1	326	433	0	13
Lane Flow Rate	112	21	468	446	281	87
Geometry Grp	6	6	7	7	7	7
Degree of Util (X)	0.218	0.042	0.755	0.68	0.583	0.164
Departure Headway (Hd)	6.98	7.378	5.806	5.487	7.451	6.833
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	514	483	623	656	484	525
Service Time	5.031	5.454	3.555	3.236	5.2	4.582
HCM Lane V/C Ratio	0.218	0.043	0.751	0.68	0.581	0.166
HCM Control Delay	12	10.8	24.3	19.2	20.2	10.9
HCM Lane LOS	B	B	C	C	C	B
HCM 95th-tile Q	0.8	0.1	6.8	5.3	3.7	0.6

Roadway Segment Level of Service Calculations

Arterial Level of Service: EB Novato Blvd #1

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
San Marin Dr	9	10.1	24.3	0.1	18
Eucalyptus	132	10.1	46.0	0.4	34
Total		20.2	70.3	0.6	28

Arterial Level of Service: WB Novato Blvd #1

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Sutro Ave	9	16.7	52.6	0.4	29
	131	3.0	16.9	0.1	26
Total		19.6	69.5	0.6	29

Arterial Level of Service: EB Novato Blvd #2

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	135	3.9	45.5	0.4	34
Raposa Vista	134	10.1	25.6	0.2	24
Wilson Ave	10	15.5	28.3	0.1	17
Simmons Ln	11	5.9	12.3	0.1	19
Grant Ave	12	8.9	43.8	0.4	34
Tamalpais Ave	13	19.6	49.4	0.3	20
Diablo Ave	14	49.1	88.9	0.4	15
Total		113.0	293.9	1.9	23

Arterial Level of Service: WB Novato Blvd #2

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
7th St	13	22.8	58.2	0.4	23
Grant Ave	12	5.0	37.5	0.3	27
Simmons Ln	11	15.9	49.6	0.4	30
Wilson Ave	10	6.0	12.6	0.1	18
Raposa Vista	134	12.7	26.1	0.1	19
	135	4.0	21.1	0.2	29
Eucalyptus	132	11.1	49.6	0.4	31
Total		77.5	254.6	1.9	26

Arterial Level of Service: NB Novato Blvd #3

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Redwood Blvd	30	12.3	28.2	0.2	21
	92	4.6	55.6	0.5	34
Sunset Parkway	29	8.7	36.3	0.3	32
Rowland Boulevard	23	39.5	62.1	0.3	15
Arthur Street	22	6.4	33.2	0.3	36
Garden Ct	21	6.7	41.6	0.4	38
Diablo Ave	14	61.0	90.0	0.4	15
Total		139.1	347.0	2.4	25

Arterial Level of Service: SB Novato Blvd #3

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Center Rd	21	10.9	40.6	0.4	32
Arthur Street	22	10.1	46.8	0.4	34
	23	16.1	43.9	0.3	27
Sunset Parkway	29	15.6	40.1	0.3	24
	92	3.3	35.7	0.3	33
Redwood Blvd	30	12.5	62.4	0.5	30
Total		68.6	269.6	2.3	30

Arterial Level of Service: NB #3

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Nave Dr	33	27.4	39.6	0.1	12
Commercial Blvd	34	10.1	23.1	0.1	23
Digital Dr	35	8.7	19.8	0.1	24
Total		46.3	82.5	0.4	18

Arterial Level of Service: WB #3

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Hamilton Dr	35	12.4	24.1	0.1	20
Commercial Blvd	34	8.2	19.0	0.1	25
US 101 NB On Ramp	33	15.7	27.7	0.1	19
Enfrente Rd	32	17.3	30.4	0.1	15
Total		53.7	101.2	0.5	19

Arterial Level of Service: EB Novato Blvd #1

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
San Marin Dr	9	12.6	25.6	0.1	18
Eucalyptus	135	11.1	45.5	0.4	33
Total		23.7	71.1	0.5	28

Arterial Level of Service: WB Novato Blvd #1

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Sutro Ave	9	28.1	63.2	0.4	24
	134	3.8	16.5	0.1	28
Total		31.9	79.8	0.5	25

Arterial Level of Service: EB Novato Blvd #2

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	138	4.0	45.6	0.4	33
Raposa Vista	137	11.8	27.1	0.2	22
Wilson Ave	10	15.8	28.3	0.1	17
Simmons Ln	11	5.6	12.3	0.1	19
Grant Ave	12	11.4	51.6	0.4	29
Tamalpais Ave	13	25.5	55.3	0.3	18
Diablo Ave	14	76.4	114.3	0.4	12
Total		150.5	334.5	1.9	20

Arterial Level of Service: WB Novato Blvd #2

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
7th St	13	23.4	60.2	0.4	23
Grant Ave	12	6.6	38.5	0.3	26
Simmons Ln	11	14.7	52.2	0.4	28
Wilson Ave	10	6.1	12.7	0.1	18
Raposa Vista	137	13.9	27.1	0.1	18
	138	4.0	21.2	0.2	28
Eucalyptus	135	11.0	48.8	0.4	31
Total		79.8	260.6	1.9	26

Arterial Level of Service
PM Peak Hour Existing plus Project 02/16/2018

Arterial Level of Service: NB Novato Blvd #3

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Redwood Blvd	30	12.6	28.5	0.2	21
	92	4.6	71.5	0.5	26
Sunset Parkway	29	11.0	39.0	0.3	30
Rowland Boulevard	23	57.9	79.3	0.3	12
Arthur Street	22	11.9	39.5	0.3	30
Garden Ct	21	8.2	46.3	0.4	35
Diablo Ave	14	77.6	109.3	0.4	12
Total		183.8	413.4	2.4	21

Arterial Level of Service: SB Novato Blvd #3

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Center Rd	21	13.1	46.1	0.4	29
Arthur Street	22	11.0	45.7	0.4	35
	23	13.0	44.6	0.3	27
Sunset Parkway	29	17.0	40.3	0.3	24
	92	3.5	36.1	0.3	33
Redwood Blvd	30	15.2	66.0	0.5	29
Total		72.8	278.9	2.3	29

Arterial Level of Service: NB #3

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Nave Dr	33	28.6	39.5	0.1	12
Commercial Blvd	34	12.4	25.7	0.1	21
Digital Dr	35	8.8	19.9	0.1	24
Total		49.7	85.0	0.4	17

Arterial Level of Service: WB #3

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Hamilton Dr	35	16.7	28.3	0.1	17
Commercial Blvd	34	26.5	37.4	0.1	13
US 101 NB On Ramp	33	29.3	40.8	0.1	13
Enfrente Rd	32	16.6	29.6	0.1	16
Total		89.2	136.1	0.5	14

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Arterial Level of Service: EB Novato Blvd #2

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	138	4.1	45.9	0.4	33
Raposa Vista	137	12.1	27.6	0.2	22
Wilson Ave	10	16.5	29.1	0.1	17
Simmons Ln	11	6.1	12.8	0.1	18
Grant Ave	12	10.6	50.2	0.4	29
Tamalpais Ave	13	25.2	55.2	0.3	18
	45	5.1	41.6	0.3	27
Diablo Ave	14	19.3	26.6	0.1	9
Center Rd	21	14.2	48.0	0.4	27
Total		113.4	337.1	2.2	24

Arterial Level of Service: WB Novato Blvd #2

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Diablo Ave	14	46.0	74.1	0.4	18
	45	5.5	13.7	0.1	17
7th St	13	42.2	77.6	0.3	15
Grant Ave	12	6.7	38.5	0.3	26
Simmons Ln	11	14.2	51.7	0.4	29
Wilson Ave	10	6.2	12.8	0.1	18
Raposa Vista	137	14.3	27.4	0.1	18
	138	4.3	21.4	0.2	28
Eucalyptus	135	12.5	50.8	0.4	30
Total		151.9	368.0	2.2	22

Arterial Level of Service: NB Novato Blvd #3

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Redwood Blvd	30	16.2	32.1	0.2	18
	92	5.6	72.1	0.5	26
Sunset Parkway	29	9.9	38.7	0.3	30
Rowland Boulevard	23	68.7	90.7	0.3	11
Arthur Street	22	9.6	40.8	0.3	29
Garden Ct	21	7.8	46.0	0.4	35
Diablo Ave	14	46.0	74.1	0.4	18
Total		163.7	394.5	2.4	22

Arterial Level of Service
PM Peak Hour Existing + Project MITIGATED 02/16/2018

Arterial Level of Service: SB Novato Blvd #3

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Center Rd	21	14.2	48.0	0.4	27
Arthur Street	22	13.4	53.7	0.4	30
	23	15.0	46.6	0.3	26
Sunset Parkway	29	14.7	38.2	0.3	25
	92	3.4	35.9	0.3	33
Redwood Blvd	30	18.9	68.2	0.5	28
Total		79.6	290.5	2.3	28

Arterial Level of Service: NB #3

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Nave Dr	33	33.3	45.9	0.1	10
Commercial Blvd	34	8.9	22.7	0.1	23
Digital Dr	35	8.1	19.1	0.1	25
Total		50.3	87.8	0.4	17

Arterial Level of Service: WB #3

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Hamilton Dr	35	16.1	29.1	0.1	17
Commercial Blvd	34	19.8	31.7	0.1	15
US 101 NB On Ramp	33	24.0	37.3	0.1	14
Enfrente Rd	32	16.1	29.0	0.1	16
Total		76.1	127.2	0.5	15

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Arterial Level of Service: EB Novato Blvd #1

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
San Marin Dr	9	14.5	27.8	0.1	17
Eucalyptus	136	11.1	45.1	0.4	33
Total		25.6	72.9	0.5	27

Arterial Level of Service: WB Novato Blvd #1

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Sutro Ave	9	35.7	71.3	0.4	21
	135	3.8	16.7	0.1	28
Total		39.4	88.0	0.5	22

Arterial Level of Service: EB Novato Blvd #2

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	139	4.0	45.8	0.4	33
Raposa Vista	138	12.2	27.8	0.2	22
Wilson Ave	10	19.8	32.2	0.1	15
Simmons Ln	11	7.4	14.2	0.1	16
Grant Ave	12	12.7	53.1	0.4	28
Tamalpais Ave	13	28.5	58.5	0.3	17
Diablo Ave	14	63.5	101.8	0.4	13
Total		148.2	333.3	1.9	20

Arterial Level of Service: WB Novato Blvd #2

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
7th St	13	29.0	65.1	0.4	21
Grant Ave	12	6.0	38.4	0.3	26
Simmons Ln	11	18.3	55.5	0.4	27
Wilson Ave	10	7.6	14.2	0.1	16
Raposa Vista	138	14.5	27.8	0.1	17
	139	4.3	21.4	0.2	28
Eucalyptus	136	11.9	50.1	0.4	30
Total		91.7	272.4	1.9	25

Arterial Level of Service: NB Novato Blvd #3

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Redwood Blvd	30	15.5	31.6	0.2	19
	114	5.1	74.0	0.5	26
Sunset Parkway	29	11.7	40.3	0.3	29
Rowland Boulevard	23	60.9	82.6	0.3	12
Arthur Street	22	9.9	41.7	0.3	29
Garden Ct	21	7.2	45.6	0.4	35
Diablo Ave	14	80.1	112.3	0.4	12
Total		190.4	428.0	2.4	20

Arterial Level of Service: SB Novato Blvd #3

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Center Rd	21	12.5	46.3	0.4	28
Arthur Street	22	12.4	52.3	0.4	31
	23	13.1	44.9	0.3	27
Sunset Parkway	29	15.3	38.7	0.3	25
	114	3.3	35.4	0.3	33
Redwood Blvd	30	14.7	65.1	0.5	29
Total		71.4	282.7	2.3	29

Arterial Level of Service: NB #3

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Nave Dr	33	30.9	40.9	0.1	11
Commercial Blvd	34	13.7	27.1	0.1	20
Digital Dr	35	18.3	29.6	0.1	16
Total		62.9	97.7	0.4	15

Arterial Level of Service: WB #3

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Hamilton Dr	35	16.7	28.6	0.1	17
Commercial Blvd	34	28.4	38.8	0.1	12
US 101 NB On Ramp	33	30.5	41.9	0.1	13
Enfrente Rd	32	17.4	30.2	0.1	15
Total		93.0	139.4	0.5	14

Arterial Level of Service: EB Novato Blvd #2

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	139	4.3	46.4	0.4	33
Raposa Vista	138	13.1	28.3	0.2	21
Wilson Ave	10	19.6	32.1	0.1	15
Simmons Ln	11	6.2	12.9	0.1	18
Grant Ave	12	11.4	51.0	0.4	29
Tamalpais Ave	13	26.0	55.7	0.3	18
	200	4.3	37.8	0.3	28
Diablo Ave	14	21.8	31.9	0.1	10
Center Rd	21	15.5	50.1	0.4	26
Total		122.3	346.1	2.2	23

Arterial Level of Service: WB Novato Blvd #2

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Diablo Ave	14	41.4	70.6	0.4	19
	200	6.2	17.3	0.1	18
7th St	13	42.7	75.0	0.3	14
Grant Ave	12	5.7	37.9	0.3	27
Simmons Ln	11	16.2	53.7	0.4	28
Wilson Ave	10	6.8	13.4	0.1	17
Raposa Vista	138	14.9	28.1	0.1	17
	139	4.1	21.1	0.2	29
Eucalyptus	136	11.6	49.8	0.4	31
Total		149.5	366.9	2.2	22

Arterial Level of Service: NB Novato Blvd #3

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Redwood Blvd	30	16.1	32.2	0.2	18
	114	5.7	73.0	0.5	26
Sunset Parkway	29	11.6	39.8	0.3	29
Rowland Boulevard	23	62.9	83.4	0.3	11
Arthur Street	22	10.9	42.3	0.3	28
Garden Ct	21	8.3	46.3	0.4	35
Diablo Ave	14	41.4	70.6	0.4	19
Total		157.0	387.8	2.4	23

Arterial Level of Service: SB Novato Blvd #3

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Center Rd	21	15.5	50.1	0.4	26
Arthur Street	22	13.3	53.2	0.4	30
	23	13.4	45.1	0.3	26
Sunset Parkway	29	19.7	43.4	0.3	22
	114	3.6	36.2	0.3	32
Redwood Blvd	30	16.0	65.1	0.5	29
Total		81.6	293.1	2.3	28

Arterial Level of Service: NB #3

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Nave Dr	33	34.0	44.1	0.1	10
Commercial Blvd	34	7.5	20.7	0.1	26
Digital Dr	35	8.5	19.8	0.1	24
Total		50.0	84.5	0.4	17

Arterial Level of Service: WB #3

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Hamilton Dr	35	14.8	26.4	0.1	19
Commercial Blvd	34	22.6	33.1	0.1	14
US 101 NB On Ramp	33	26.1	37.7	0.1	14
Enfrente Rd	32	18.3	31.3	0.1	15
Total		81.8	128.4	0.5	15

Freeway Level of Service Calculations

HCS7 Freeway Facilities Report

Project Information

Analyst	W-Trans	Agency	
Jurisdiction	City of Novato	Time Period Analyzed	AM Peak Hour - Northbound
Analysis Year	2016	Date	4/18/2017
Project Description	City of Novato General Plan Update EIR		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	24
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	Novato S City Limits->Alameda del Prado	2000	5
2	Diverge	Basic	Alameda del Prado Off->	1500	5
3	Basic	Basic	Alameda del Prado Off->Alameda del Prado On	2000	4
4	Merge	Merge	Alameda del Prado On->	1000	4
5	Basic	Basic	Alameda del Prado On->Nave Off	2600	4
6	Diverge	Diverge	Nave Off->	1000	4
7	Basic	Basic	Nave Off->Nave On	2000	4
8	Merge	Basic	Nave On->	500	5
9	Merge	Merge	Ignacio On->	1500	5
10	Diverge	Basic	SR37 Off->	1500	5
11	Diverge	Diverge	Novato Blvd Off->	1500	4
12	Basic	Basic	Novato Blvd Off->SR 37 On	2650	4
13	Weaving	Weaving	SR37->Rowland Blvd	2050	5
14	Basic	Basic	Rowland Blvd Off->Rowland Blvd On	2900	4
15	Merge	Merge	Rowland Blvd On->	1200	4
16	Diverge	Diverge	De Long Off->	1200	4
17	Basic	Basic	De Long Off->De Long On	2000	4
18	Merge	Merge	De Long Ave On->	1200	4
19	Diverge	Diverge	Atherton Ave Off->	1200	4
20	Basic	Basic	Atherton Ave Off->Atherton Ave On	900	4
21	Merge	Merge	Atherton Ave On->	1000	4
22	Basic	Basic	Atherton On -> End HOV	2300	3
23	Basic	Basic	End HOV	2000	2
24	Basic	Basic	End HOV -> Begin 2 lane fwy	2500	2

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	4598	12000	0.38	75.4	12.2	B

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	4598	363	12000	2000	0.38	0.18	75.4	-	12.2	-	B

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	4237	9600	0.44	75.3	14.1	B

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	4311	74	9600	2000	0.45	0.04	69.1	64.7	15.6	17.1	B

Segment 5: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	4310	9600	0.45	75.3	14.3	B

Segment 6: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	1.00	0.957	1.000	4310	810	9600	2000	0.45	0.40	67.7	58.7	15.9	22.5	C

Segment 7: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	3464	9600	0.36	75.4	11.5	B

Segment 8: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	3659	195	12000	2000	0.29	0.10	75.4	-	9.7	-	A

Segment 9: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	4241	584	12000	2000	0.35	0.29	69.3	64.4	9.9	17.5	B

Segment 10: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	4237	926	12000	4200	0.35	0.22	75.4	-	11.2	-	B

Segment 11: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	3318	179	9600	2000	0.35	0.09	70.7	60.6	11.7	17.6	B

Segment 12: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	3140	9600	0.33	75.4	10.4	A

Segment 13: Weaving

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	3737	6630	0.57	65.9	11.4	B

Segment 14: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	2931	9600	0.31	75.4	9.7	A

Segment 15: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	3257	326	9600	2000	0.34	0.16	70.3	66.4	11.6	10.8	B

Segment 16: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	3255	726	9600	2000	0.34	0.36	67.4	58.9	12.1	15.9	B

Segment 17: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	2534	9600	0.26	75.4	8.4	A

Segment 18: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	2713	179	9600	2000	0.28	0.09	70.8	66.6	9.6	8.5	A

Segment 19: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	0.990	2712	590	9600	2000	0.28	0.30	67.8	59.3	10.0	13.2	B

Segment 20: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	2132	9600	0.22	75.4	7.1	A

Segment 21: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	2574	442	9014	1878	0.29	0.24	66.3	64.3	9.7	10.0	A

Segment 22: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	1.000	2617	7200	0.36	71.7	12.2	B

Segment 23: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	2571	4472	0.57	67.7	19.0	C

Segment 24: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	2571	3628	0.71	51.8	24.8	C

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	71.1	12.0	11.6	6.4	B

Facility Overall Results

Space Mean Speed, mi/h	71.1	Density, veh/mi/ln	11.6
Average Travel Time, min	6.4		

HCS7 Freeway Facilities Report

Project Information

Analyst	W-Trans	Agency	
Jurisdiction	City of Novato	Time Period Analyzed	AM Peak Hour - Southbound
Analysis Year	2016	Date	4/21/2017
Project Description	City of Novato General Plan EIR		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	24
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	N Novato City Limits->San Marin Dr	3200	3
2	Diverge	Diverge	San Marin Dr Off->	1500	3
3	Basic	Basic	San Marin Dr Off->San Marin Dr On	2100	3
4	Merge	Merge	San Marin Dr On->	1175	3
5	Diverge	Diverge	De Long Ave Off->	1175	3
6	Basic	Basic	De Long Ave Off->De Long Ave On	1975	3
7	Merge	Merge	De Long Ave On->	1170	3
8	Diverge	Diverge	BEGIN HOV	200	3
9	Diverge	Diverge	Rowland Blvd Off->	1170	3
10	Basic	Basic	Rowland Blvd Off->Rowland Blvd On	3150	3
11	Merge	Merge	Rowland Blvd On->	1200	3
12	Basic	Basic	Rowland Blvd->SR37-Novato Blvd	770	3
13	Diverge	Diverge	SR37-Novato Blvd Off->	1200	3
14	Basic	Basic	SR37-Novato Blvd Off->SR37-Novato Blvd On	3400	3
15	Merge	Basic	SR37-Novato Blvd On->	1030	4
16	Diverge	Diverge	Ignacio-Enfrente Off->	1000	4
17	Diverge	Basic	BMK-Nave Off->	800	4
18	Basic	Basic	Ignacio Blvd Off->Ignacio Blvd On	1425	3
19	Merge	Merge	Ignacio Blvd On->	1500	3
20	Basic	Basic	Ignacio Blvd->Alameda Del Prado	2250	3
21	Diverge	Diverge	ADP Off->	1500	3
22	Basic	Basic	ADP Off->ADP On	1200	3
23	Merge	Basic	ADP On->	1500	3
24	Basic	Basic	Alameda Del Prado->S Novato City Limits	1000	4

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.957	6664	7200	0.93	58.6	37.9	E

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.957	0.980	6664	575	7200	2000	0.93	0.29	66.6	61.5	33.4	37.5	E

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.954	6089	7200	0.85	63.4	32.0	D

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.960	0.980	6605	516	7200	2100	0.92	0.25	61.2	57.8	36.0	35.3	E

Segment 5: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.960	0.980	6605	333	7200	2000	0.91	0.17	67.2	62.3	32.8	36.6	E

Segment 6: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.958	6272	7200	0.87	61.9	33.8	D

Segment 7: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.963	0.980	6798	526	7200	2000	0.94	0.26	60.3	56.8	37.6	36.2	E

Segment 8: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	1.00	0.963	0.990	6798	1091	7200	2200	0.94	0.50	69.9	66.5	32.4	41.9	E

Segment 9: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	

1	0.98	0.95	0.963	0.980	5707	784	7200	2000	0.78	0.39	66.3	60.9	28.7	34.7	D

Segment 10: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.960	4923	7200	0.67	70.6	23.2	C

Segment 11: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.966	0.980	5406	483	7200	2000	0.74	0.24	64.6	61.7	27.9	29.7	D

Segment 12: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.966	5406	7200	0.74	68.0	26.5	D

Segment 13: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.966	0.962	5406	274	7200	2100	0.74	0.13	69.2	64.6	26.0	32.7	D

Segment 14: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.967	5054	7200	0.70	70.0	24.1	C

Segment 15: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.966	0.962	7647	2779	9600	4000	0.52	0.69	60.3	-	31.7	-	D

Segment 16: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.966	0.980	7460	639	9600	2000	0.80	0.32	40.7	61.3	45.8	31.8	F

Segment 17: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.964	0.980	6644	763	9600	2000	0.74	0.38	28.7	-	57.9	-	F

Segment 18: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.962	5720	7200	0.88	30.2	63.0	F

Segment 19: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.965	0.980	6262	650	7200	2000	0.97	0.32	34.2	55.2	61.0	37.4	F

Segment 20: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.965	6112	7200	0.97	31.5	64.7	F

Segment 21: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.932	0.980	5992	134	7200	2000	1.00	0.07	29.7	62.9	67.2	39.2	F

Segment 22: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.931	5775	7200	0.99	26.4	72.9	F

Segment 23: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.934	0.980	6704	929	7200	2000	0.98	0.46	60.4	-	37.0	-	F

Segment 24: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.934	6704	9600	0.84	70.1	23.9	C

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	49.2	39.1	37.4	8.5	F

Facility Overall Results

Space Mean Speed, mi/h	49.2	Density, veh/mi/ln	37.4
Average Travel Time, min	8.5		

HCS7 Freeway Facilities Report

Project Information

Analyst	W-Trans	Agency	
Jurisdiction	City of Novato	Time Period Analyzed	PM Peak Hour - Northbound
Analysis Year	2016	Date	4/18/2017
Project Description	City of Novato General Plan Update EIR		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	23
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	Novato S City Limits->Alameda del Prado	2000	4
2	Diverge	Basic	Alameda del Prado Off->	1500	4
3	Basic	Basic	Alameda del Prado Off->Alameda del Prado On	2000	3
4	Merge	Merge	Alameda del Prado On->	1000	3
5	Basic	Basic	Alameda del Prado On->Nave Off	2600	3
6	Diverge	Diverge	Nave Off->	1000	3
7	Basic	Basic	Nave Off->Nave On	2000	3
8	Merge	Basic	Nave On->	500	4
9	Merge	Merge	Ignacio On->	1500	4
10	Diverge	Basic	SR37 Off->	1500	4
11	Diverge	Diverge	Novato Blvd Off->	1500	3
12	Basic	Basic	Novato Blvd Off->SR 37 On	2650	3
13	Weaving	Weaving	SR37->Rowland Blvd	2050	4
14	Basic	Basic	Rowland Blvd Off->Rowland Blvd On	2900	3
15	Merge	Merge	Rowland Blvd On->	1200	3
16	Diverge	Diverge	De Long Off->	1200	3
17	Basic	Basic	De Long Off->De Long On	2000	3
18	Merge	Merge	De Long Ave On->	1200	3
19	Diverge	Diverge	Atherton Ave Off->	1200	3
20	Basic	Basic	Atherton Ave Off->Atherton Ave On	900	3
21	Merge	Merge	Atherton Ave On->	1000	3
22	Merge	Merge	End HOV	1000	3
23	Basic	Basic	End HOV -> Begin 2 lane fwy	5100	2

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	7638	9600	0.80	66.0	28.9	D

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	7638	874	9600	2000	0.80	0.44	67.3	-	28.4	-	D

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	6764	7200	0.94	57.6	39.1	E

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	6964	200	7200	2000	0.97	0.10	59.8	56.2	38.8	36.5	E

Segment 5: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	6964	7200	0.97	55.7	41.7	E

Segment 6: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	1.00	0.957	1.000	6964	885	7200	2000	0.97	0.44	64.2	58.4	36.2	39.1	E

Segment 7: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	6079	7200	0.84	63.4	31.9	D

Segment 8: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	6326	247	9600	2000	0.63	0.12	67.6	-	23.4	-	C

Segment 9: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	7421	1095	9600	2000	0.77	0.55	65.1	60.3	28.5	32.1	D

Segment 10: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	7421	2453	9600	4200	0.77	0.58	67.0	-	27.7	-	D

Segment 11: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	4968	384	7200	2000	0.69	0.19	65.7	59.9	25.2	31.9	D

Segment 12: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	4584	7200	0.63	72.1	21.2	C

Segment 13: Weaving

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	5477	5568	1.00	61.9	22.5	C

Segment 14: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	4004	7200	0.55	74.0	18.0	C

Segment 15: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	4525	521	7200	2000	0.63	0.26	66.8	64.5	22.6	22.0	C

Segment 16: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	4525	1568	7200	2000	0.62	0.78	61.7	56.4	24.4	28.3	D

Segment 17: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	2957	7200	0.41	74.4	13.1	B

Segment 18: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	3257	300	7200	2000	0.45	0.15	68.3	65.9	15.9	15.5	B

Segment 19: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	0.990	3257	946	7200	2000	0.45	0.47	63.1	58.3	17.2	21.0	C

Segment 20: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	2286	7200	0.32	73.2	10.1	A

Segment 21: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	2816	800	6761	1878	0.46	0.43	18.1	64.0	52.0	13.2	F

Segment 22: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	3049	474	6761	1878	0.53	0.25	10.0	62.2	101.2	20.3	F

Segment 23: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	3049	3274	1.09	55.6	21.1	F

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	55.6	28.2	27.0	8.1	F

Facility Overall Results

Space Mean Speed, mi/h	55.6	Density, veh/mi/ln	27.0
Average Travel Time, min	8.1		

HCS7 Freeway Facilities Report

Project Information

Analyst	W-Trans	Agency	
Jurisdiction	City of Novato	Time Period Analyzed	PM Peak Hour - Southbound
Analysis Year	2016	Date	4/21/2017
Project Description			

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	24
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	N Novato City Limits->San Marin Dr	3200	3
2	Diverge	Diverge	San Marin Dr Off->	1500	3
3	Basic	Basic	San Marin Dr Off->San Marin Dr On	2100	3
4	Merge	Merge	San Marin Dr On->	1175	3
5	Diverge	Diverge	De Long Ave Off->	1175	3
6	Basic	Basic	De Long Ave Off->De Long Ave On	1975	3
7	Merge	Basic	De Long Ave On->	1170	3
8	Diverge	Diverge	BEGIN HOV	200	4
9	Diverge	Diverge	Rowland Blvd Off->	1170	4
10	Basic	Basic	Rowland Blvd Off->Rowland Blvd On	3150	4
11	Merge	Merge	Rowland Blvd On->	1200	4
12	Basic	Basic	Rowland Blvd->SR37-Novato Blvd	770	4
13	Diverge	Diverge	SR37-Novato Blvd Off->	1200	4
14	Basic	Basic	SR37-Novato Blvd Off->SR37-Novato Blvd On	3400	4
15	Merge	Basic	SR37-Novato Blvd On->	1030	5
16	Diverge	Diverge	Ignacio-Enfrente Off->	1000	5
17	Diverge	Basic	BMK-Nave Off->	800	5
18	Basic	Basic	Ignacio Blvd Off->Ignacio Blvd On	1425	4
19	Merge	Merge	Ignacio Blvd On->	1500	4
20	Basic	Basic	Ignacio Blvd->Alameda Del Prado	2250	4
21	Diverge	Diverge	ADP Off->	1500	4
22	Basic	Basic	ADP Off->ADP On	1200	4
23	Merge	Merge	ADP On->	1500	4
24	Basic	Basic	Alameda Del Prado->S Novato City Limits	1000	4

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.957	3455	7200	0.48	75.1	15.3	B

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.957	0.980	3455	338	7200	2000	0.48	0.17	64.2	58.4	17.9	23.4	C

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.954	3129	7200	0.43	75.4	13.8	B

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.960	0.980	3861	752	7200	2000	0.54	0.38	66.5	63.8	19.4	23.4	C

Segment 5: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.960	0.980	3853	199	7200	2000	0.54	0.10	67.9	62.7	18.9	24.7	C

Segment 6: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.958	3664	7200	0.51	74.8	16.3	B

Segment 7: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.963	0.980	4537	892	7200	2000	0.51	0.45	72.3	-	20.9	-	C

Segment 8: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	1.00	0.963	0.990	4525	0	9600	2200	0.47	0.00	75.7	69.8	14.9	22.9	C

Segment 9: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	

1	0.98	0.95	0.963	0.980	4525	419	9600	2000	0.47	0.21	70.9	62.0	16.0	22.3	C

Segment 10: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.960	4124	9600	0.43	75.4	13.7	B

Segment 11: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.966	0.980	5329	1230	9600	2000	0.56	0.62	67.3	63.2	19.8	25.5	C

Segment 12: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.966	5308	9600	0.55	74.1	17.9	B

Segment 13: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.966	0.962	5308	596	9600	2100	0.55	0.28	71.4	63.6	18.6	26.1	C

Segment 14: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.967	4727	9600	0.49	75.0	15.8	B

Segment 15: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.966	0.962	6127	1395	12000	4000	0.39	0.35	74.8	-	16.4	-	B

Segment 16: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.966	0.980	6079	591	12000	2000	0.51	0.30	70.5	61.5	14.7	22.0	C

Segment 17: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.964	0.980	5510	542	12000	2000	0.46	0.27	75.2	-	14.7	-	B

Segment 18: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.962	4985	9600	0.52	74.6	16.7	B

Segment 19: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.965	0.980	5921	951	9600	2000	0.62	0.48	67.1	63.0	22.1	26.2	C

Segment 20: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.965	5906	9600	0.62	72.7	20.3	C

Segment 21: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.932	0.980	6115	247	9600	2000	0.64	0.12	71.0	62.5	21.5	24.3	C

Segment 22: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.931	5869	9600	0.61	72.8	20.2	C

Segment 23: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.934	0.980	6473	623	9600	2000	0.67	0.31	68.7	66.2	23.6	19.0	B

Segment 24: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.934	6484	9600	0.68	70.9	22.9	C

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	72.0	17.7	16.9	5.8	B

Facility Overall Results

Space Mean Speed, mi/h	72.0	Density, veh/mi/ln	16.9
Average Travel Time, min	5.8		

HCS7 Freeway Facilities Report

Project Information

Analyst	W-Trans	Agency	
Jurisdiction	City of Novato	Time Period Analyzed	AM Peak Existing+Project - Northbound
Analysis Year	2016	Date	6/8/17
Project Description	City of Novato General Plan Update EIR		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	24
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	Novato S City Limits->Alameda del Prado	2000	5
2	Diverge	Basic	Alameda del Prado Off->	1500	5
3	Basic	Basic	Alameda del Prado Off->Alameda del Prado On	2000	4
4	Merge	Merge	Alameda del Prado On->	1000	4
5	Basic	Basic	Alameda del Prado On->Nave Off	2600	4
6	Diverge	Diverge	Nave Off->	1000	4
7	Basic	Basic	Nave Off->Nave On	2000	4
8	Merge	Basic	Nave On->	500	5
9	Merge	Merge	Ignacio On->	1500	5
10	Diverge	Basic	SR37 Off->	1500	5
11	Diverge	Diverge	Novato Blvd Off->	1500	4
12	Basic	Basic	Novato Blvd Off->SR 37 On	2650	4
13	Weaving	Weaving	SR37->Rowland Blvd	2050	5
14	Basic	Basic	Rowland Blvd Off->Rowland Blvd On	2900	4
15	Merge	Merge	Rowland Blvd On->	1200	4
16	Diverge	Diverge	De Long Off->	1200	4
17	Basic	Basic	De Long Off->De Long On	2000	4
18	Merge	Merge	De Long Ave On->	1200	4
19	Diverge	Diverge	Atherton Ave Off->	1200	4
20	Basic	Basic	Atherton Ave Off->Atherton Ave On	900	4
21	Merge	Merge	Atherton Ave On->	1000	4
22	Basic	Basic	Atherton On -> End HOV	2300	3
23	Basic	Basic	End HOV	2000	2
24	Basic	Basic	End HOV -> Begin 2 lane fwy	2500	2

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	5068	12000	0.42	75.4	13.4	B

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	5068	374	12000	2000	0.42	0.19	75.4	-	13.4	-	B

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	4697	9600	0.49	75.0	15.7	B

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	4814	117	9600	2000	0.50	0.06	68.7	64.5	17.5	18.9	B

Segment 5: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	4813	9600	0.50	74.9	16.1	B

Segment 6: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	1.00	0.957	1.000	4813	949	9600	2000	0.50	0.47	67.2	58.3	17.9	25.1	C

Segment 7: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	3821	9600	0.40	75.4	12.7	B

Segment 8: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	4019	198	12000	2000	0.32	0.10	75.4	-	10.7	-	A

Segment 9: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	4811	793	12000	2000	0.40	0.40	68.9	64.1	11.4	19.9	B

Segment 10: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	4805	952	12000	4200	0.40	0.23	75.4	-	12.7	-	B

Segment 11: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	3860	183	9600	2000	0.40	0.09	70.7	60.6	13.6	19.6	B

Segment 12: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	3678	9600	0.38	75.4	12.2	B

Segment 13: Weaving

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	4326	6576	0.66	65.1	13.4	B

Segment 14: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	3344	9600	0.35	75.4	11.1	B

Segment 15: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	3753	409	9600	2000	0.39	0.20	70.0	66.3	13.4	12.7	B

Segment 16: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	3750	845	9600	2000	0.39	0.42	67.1	58.6	14.0	18.4	B

Segment 17: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	2911	9600	0.30	75.4	9.7	A

Segment 18: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	3096	185	9600	2000	0.32	0.09	70.6	66.5	11.0	9.7	A

Segment 19: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	0.990	3095	876	9600	2000	0.32	0.44	66.4	58.5	11.7	16.1	B

Segment 20: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	2234	9600	0.23	75.4	7.4	A

Segment 21: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	2723	489	9014	1878	0.30	0.26	66.3	64.3	10.3	10.8	B

Segment 22: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	1.000	2769	7200	0.38	71.7	12.9	B

Segment 23: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	2720	4472	0.61	67.3	20.2	C

Segment 24: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	2720	3628	0.75	51.0	26.7	D

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	70.9	13.5	13.0	6.4	B

Facility Overall Results

Space Mean Speed, mi/h	70.9	Density, veh/mi/ln	13.0
Average Travel Time, min	6.4		

HCS7 Freeway Facilities Report

Project Information

Analyst	W-Trans	Agency	
Jurisdiction	City of Novato	Time Period Analyzed	AM Peak Existing + Project - Southbound
Analysis Year	2016	Date	6/8/17
Project Description	City of Novato General Plan EIR		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	24
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	N Novato City Limits->San Marin Dr	3200	3
2	Diverge	Diverge	San Marin Dr Off->	1500	3
3	Basic	Basic	San Marin Dr Off->San Marin Dr On	2100	3
4	Merge	Merge	San Marin Dr On->	1175	3
5	Diverge	Diverge	De Long Ave Off->	1175	3
6	Basic	Basic	De Long Ave Off->De Long Ave On	1975	3
7	Merge	Merge	De Long Ave On->	1170	3
8	Diverge	Diverge	BEGIN HOV	200	3
9	Diverge	Diverge	Rowland Blvd Off->	1170	3
10	Basic	Basic	Rowland Blvd Off->Rowland Blvd On	3150	3
11	Merge	Merge	Rowland Blvd On->	1200	3
12	Basic	Basic	Rowland Blvd->SR37-Novato Blvd	770	3
13	Diverge	Diverge	SR37-Novato Blvd Off->	1200	3
14	Basic	Basic	SR37-Novato Blvd Off->SR37-Novato Blvd On	3400	3
15	Merge	Basic	SR37-Novato Blvd On->	1030	4
16	Diverge	Diverge	Ignacio-Enfrente Off->	1000	4
17	Diverge	Basic	BMK-Nave Off->	800	4
18	Basic	Basic	Ignacio Blvd Off->Ignacio Blvd On	1425	3
19	Merge	Merge	Ignacio Blvd On->	1500	3
20	Basic	Basic	Ignacio Blvd->Alameda Del Prado	2250	3
21	Diverge	Diverge	ADP Off->	1500	3
22	Basic	Basic	ADP Off->ADP On	1200	3
23	Merge	Basic	ADP On->	1500	3
24	Basic	Basic	Alameda Del Prado->S Novato City Limits	1000	4

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.957	6922	7200	0.97	56.1	41.1	E

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.957	0.980	6828	723	7200	2000	0.97	0.36	66.3	61.1	34.3	38.4	E

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.954	5899	7200	0.87	38.4	51.2	F

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.960	0.980	6524	690	7200	2100	0.96	0.33	40.5	55.4	53.7	37.3	F

Segment 5: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.960	0.980	6447	339	7200	2000	0.96	0.17	39.0	62.2	55.1	38.8	F

Segment 6: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.958	5960	7200	0.92	30.0	66.3	F

Segment 7: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.963	0.980	6704	744	7200	2000	1.02	0.37	60.2	56.5	37.1	36.4	F

Segment 8: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	1.00	0.963	0.990	6704	1091	7200	2200	1.01	0.50	70.0	66.5	31.9	41.6	F

Segment 9: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	

1	0.98	0.95	0.963	0.980	5613	857	7200	2000	0.86	0.43	66.1	60.7	28.3	34.4	D

Segment 10: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.960	4756	7200	0.74	71.4	22.2	C

Segment 11: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.966	0.980	5417	661	7200	2000	0.83	0.33	64.3	61.4	28.1	30.3	D

Segment 12: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.966	5417	7200	0.83	68.0	26.6	D

Segment 13: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.966	0.962	5417	316	7200	2100	0.83	0.15	69.1	64.5	26.1	32.8	D

Segment 14: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.967	5101	7200	0.78	69.8	24.4	C

Segment 15: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.966	0.962	7988	2896	9600	4000	0.59	0.72	57.6	-	34.7	-	D

Segment 16: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.966	0.980	7832	657	9600	2000	0.88	0.33	69.2	61.3	28.3	32.3	D

Segment 17: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.964	0.980	7024	1232	9600	2000	0.81	0.62	36.5	-	48.1	-	F

Segment 18: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.962	5640	7200	0.92	30.2	62.2	F

Segment 19: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.965	0.980	6248	694	7200	2000	1.01	0.35	34.9	52.8	59.6	39.1	F

Segment 20: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.965	6119	7200	1.01	32.5	62.7	F

Segment 21: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.932	0.980	6032	215	7200	2000	1.05	0.11	30.3	62.6	66.4	41.7	F

Segment 22: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.931	5736	7200	1.02	26.1	73.3	F

Segment 23: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.934	0.980	6704	968	7200	2000	1.01	0.48	60.3	-	37.1	-	F

Segment 24: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.934	6704	9600	0.86	70.1	23.9	C

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	45.8	42.3	40.5	9.1	F

Facility Overall Results

Space Mean Speed, mi/h	45.8	Density, veh/mi/ln	40.5
Average Travel Time, min	9.1		

HCS7 Freeway Facilities Report

Project Information

Analyst	W-Trans	Agency	
Jurisdiction	City of Novato	Time Period Analyzed	PM Peak Existing + Project - Northbound
Analysis Year	2016	Date	6/8/17
Project Description	City of Novato General Plan Update EIR		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	23
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	Novato S City Limits->Alameda del Prado	2000	4
2	Diverge	Basic	Alameda del Prado Off->	1500	4
3	Basic	Basic	Alameda del Prado Off->Alameda del Prado On	2000	3
4	Merge	Merge	Alameda del Prado On->	1000	3
5	Basic	Basic	Alameda del Prado On->Nave Off	2600	3
6	Diverge	Diverge	Nave Off->	1000	3
7	Basic	Basic	Nave Off->Nave On	2000	3
8	Merge	Basic	Nave On->	500	4
9	Merge	Merge	Ignacio On->	1500	4
10	Diverge	Basic	SR37 Off->	1500	4
11	Diverge	Diverge	Novato Blvd Off->	1500	3
12	Basic	Basic	Novato Blvd Off->SR 37 On	2650	3
13	Weaving	Weaving	SR37->Rowland Blvd	2050	4
14	Basic	Basic	Rowland Blvd Off->Rowland Blvd On	2900	3
15	Merge	Merge	Rowland Blvd On->	1200	3
16	Diverge	Diverge	De Long Off->	1200	3
17	Basic	Basic	De Long Off->De Long On	2000	3
18	Merge	Merge	De Long Ave On->	1200	3
19	Diverge	Diverge	Atherton Ave Off->	1200	3
20	Basic	Basic	Atherton Ave Off->Atherton Ave On	900	3
21	Merge	Merge	Atherton Ave On->	1000	3
22	Merge	Merge	End HOV	1000	3
23	Basic	Basic	End HOV -> Begin 2 lane fwy	5100	2

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	7628	9600	0.83	39.6	48.2	F

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	7409	929	9600	2000	0.83	0.46	28.2	-	65.6	-	F

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	6397	7200	0.98	35.4	60.2	F

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	6704	307	7200	2000	1.02	0.15	61.1	57.9	36.6	34.9	F

Segment 5: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	6704	7200	1.02	58.2	38.4	F

Segment 6: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	1.00	0.957	1.000	6704	953	7200	2000	1.02	0.48	64.1	58.2	34.9	37.8	F

Segment 7: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	5751	7200	0.89	65.8	29.1	D

Segment 8: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	6003	252	9600	2000	0.66	0.13	67.9	-	22.1	-	C

Segment 9: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	7600	1597	9600	2000	0.86	0.80	63.4	58.0	30.0	34.7	D

Segment 10: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	7600	2556	9600	4200	0.86	0.61	66.7	-	28.5	-	D

Segment 11: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	5044	389	7200	2000	0.79	0.19	65.7	59.9	25.6	32.3	D

Segment 12: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	4630	7200	0.74	72.0	21.4	C

Segment 13: Weaving

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	4487	4819	1.12	26.8	45.0	F

Segment 14: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	3617	7200	0.64	74.5	16.1	B

Segment 15: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	4244	627	7200	2000	0.72	0.31	67.1	64.8	21.1	21.0	C

Segment 16: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	4244	1861	7200	2000	0.72	0.93	60.3	55.5	23.5	27.9	C

Segment 17: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	2383	7200	0.47	74.3	10.5	A

Segment 18: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	2695	312	7200	2000	0.51	0.16	68.7	66.2	13.1	12.8	B

Segment 19: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	0.990	2695	1222	7200	2000	0.51	0.61	61.1	57.4	14.7	18.8	B

Segment 20: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	1473	7200	0.34	72.8	6.5	A

Segment 21: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	2435	962	6761	1878	0.51	0.51	65.8	64.3	12.3	10.3	B

Segment 22: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	2909	474	6761	1878	0.58	0.25	64.7	62.7	15.0	16.8	B

Segment 23: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	2909	3274	1.19	55.9	19.9	F

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	52.3	29.8	28.5	8.6	F

Facility Overall Results

Space Mean Speed, mi/h	52.3	Density, veh/mi/ln	28.5
Average Travel Time, min	8.6		

HCS7 Freeway Facilities Report

Project Information

Analyst	W-Trans	Agency	
Jurisdiction	City of Novato	Time Period Analyzed	PM Peak Existing + Project - Southbound
Analysis Year	2016	Date	6/8/17
Project Description			

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	24
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	N Novato City Limits->San Marin Dr	3200	3
2	Diverge	Diverge	San Marin Dr Off->	1500	3
3	Basic	Basic	San Marin Dr Off->San Marin Dr On	2100	3
4	Merge	Merge	San Marin Dr On->	1175	3
5	Diverge	Diverge	De Long Ave Off->	1175	3
6	Basic	Basic	De Long Ave Off->De Long Ave On	1975	3
7	Merge	Basic	De Long Ave On->	1170	3
8	Diverge	Diverge	BEGIN HOV	200	4
9	Diverge	Diverge	Rowland Blvd Off->	1170	4
10	Basic	Basic	Rowland Blvd Off->Rowland Blvd On	3150	4
11	Merge	Merge	Rowland Blvd On->	1200	4
12	Basic	Basic	Rowland Blvd->SR37-Novato Blvd	770	4
13	Diverge	Diverge	SR37-Novato Blvd Off->	1200	4
14	Basic	Basic	SR37-Novato Blvd Off->SR37-Novato Blvd On	3400	4
15	Merge	Basic	SR37-Novato Blvd On->	1030	5
16	Diverge	Diverge	Ignacio-Enfrente Off->	1000	5
17	Diverge	Basic	BMK-Nave Off->	800	5
18	Basic	Basic	Ignacio Blvd Off->Ignacio Blvd On	1425	4
19	Merge	Merge	Ignacio Blvd On->	1500	4
20	Basic	Basic	Ignacio Blvd->Alameda Del Prado	2250	4
21	Diverge	Diverge	ADP Off->	1500	4
22	Basic	Basic	ADP Off->ADP On	1200	4
23	Merge	Merge	ADP On->	1500	4
24	Basic	Basic	Alameda Del Prado->S Novato City Limits	1000	4

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.957	3626	7200	0.50	74.8	16.2	B

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.957	0.980	3626	423	7200	2000	0.50	0.21	63.9	58.1	18.9	24.4	C

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.954	3216	7200	0.45	75.3	14.2	B

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.960	0.980	4309	1113	7200	2000	0.60	0.56	65.5	62.9	21.9	26.4	C

Segment 5: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.960	0.980	4297	212	7200	2000	0.60	0.11	67.8	62.6	21.1	26.9	C

Segment 6: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.958	4097	7200	0.57	73.8	18.5	C

Segment 7: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.963	0.980	5194	1119	7200	2000	0.57	0.56	69.3	-	25.0	-	C

Segment 8: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	1.00	0.963	0.990	5179	0	9600	2200	0.54	0.00	75.4	69.8	17.2	25.6	C

Segment 9: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	

1	0.98	0.95	0.963	0.980	5179	524	9600	2000	0.54	0.26	70.4	61.7	18.4	25.3	C

Segment 10: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98		0.960		4677		9600		0.49		75.0		15.6		B

Segment 11: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.966	0.980	6077	1429	9600	2000	0.63	0.71	66.3	62.0	22.9	28.7	D

Segment 12: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98		0.966		6053		9600		0.63		72.3		20.9		C

Segment 13: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.966	0.962	6053	677	9600	2100	0.63	0.32	71.0	63.4	21.3	29.3	D

Segment 14: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98		0.967		5393		9600		0.56		73.9		18.2		C

Segment 15: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.966	0.962	6835	1436	12000	4000	0.45	0.36	73.8	-	18.5	-	C

Segment 16: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.966	0.980	6785	597	12000	2000	0.57	0.30	70.7	61.5	16.3	24.3	C

Segment 17: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.964	0.980	6210	843	12000	2000	0.52	0.42	74.7	-	16.6	-	B

Segment 18: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.962	5391	9600	0.56	73.9	18.2	C

Segment 19: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.965	0.980	6465	1091	9600	2000	0.67	0.55	66.4	62.1	24.3	28.4	D

Segment 20: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.965	6448	9600	0.67	71.1	22.7	C

Segment 21: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.932	0.980	6676	347	9600	2000	0.70	0.17	70.5	62.2	23.7	26.9	C

Segment 22: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.931	6330	9600	0.66	71.5	22.1	C

Segment 23: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.934	0.980	7031	722	9600	2000	0.73	0.36	67.9	65.3	25.9	21.1	C

Segment 24: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.934	7043	9600	0.73	68.8	25.6	C

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	71.2	19.7	18.9	5.8	C

Facility Overall Results

Space Mean Speed, mi/h	71.2	Density, veh/mi/ln	18.9
Average Travel Time, min	5.8		

HCS7 Freeway Facilities Report

Project Information

Analyst	W-Trans	Agency	
Jurisdiction	City of Novato	Time Period Analyzed	AM Peak Cumulative with Project - Northbound
Analysis Year	2016	Date	6/8/17
Project Description	City of Novato General Plan Update EIR		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	24
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	Novato S City Limits->Alameda del Prado	2000	5
2	Diverge	Basic	Alameda del Prado Off->	1500	5
3	Basic	Basic	Alameda del Prado Off->Alameda del Prado On	2000	4
4	Merge	Merge	Alameda del Prado On->	1000	4
5	Basic	Basic	Alameda del Prado On->Nave Off	2600	4
6	Diverge	Diverge	Nave Off->	1000	4
7	Basic	Basic	Nave Off->Nave On	2000	4
8	Merge	Basic	Nave On->	500	5
9	Merge	Merge	Ignacio On->	1500	5
10	Diverge	Basic	SR37 Off->	1500	5
11	Diverge	Diverge	Novato Blvd Off->	1500	4
12	Basic	Basic	Novato Blvd Off->SR 37 On	2650	4
13	Weaving	Weaving	SR37->Rowland Blvd	2050	5
14	Basic	Basic	Rowland Blvd Off->Rowland Blvd On	2900	4
15	Merge	Merge	Rowland Blvd On->	1200	4
16	Diverge	Diverge	De Long Off->	1200	4
17	Basic	Basic	De Long Off->De Long On	2000	4
18	Merge	Merge	De Long Ave On->	1200	4
19	Diverge	Diverge	Atherton Ave Off->	1200	4
20	Basic	Basic	Atherton Ave Off->Atherton Ave On	900	4
21	Merge	Merge	Atherton Ave On->	1000	4
22	Basic	Basic	Atherton On -> End HOV	2300	3
23	Basic	Basic	End HOV	2000	2
24	Basic	Basic	End HOV -> Begin 2 lane fwy	2500	2

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	5426	12000	0.45	75.3	14.4	B

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	5426	378	12000	2000	0.45	0.19	75.3	-	14.4	-	B

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	5051	9600	0.53	74.5	17.0	B

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	5168	117	9600	2000	0.54	0.06	68.5	64.4	18.9	20.0	B

Segment 5: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	5167	9600	0.54	74.4	17.4	B

Segment 6: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	1.00	0.957	1.000	5167	957	9600	2000	0.54	0.48	67.2	58.2	19.2	26.5	C

Segment 7: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	4167	9600	0.43	75.4	13.8	B

Segment 8: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	4367	200	12000	2000	0.35	0.10	75.4	-	11.6	-	B

Segment 9: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	5165	799	12000	2000	0.43	0.40	68.8	64.0	12.2	20.8	C

Segment 10: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	5159	1049	12000	4200	0.43	0.25	75.4	-	13.7	-	B

Segment 11: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	4117	189	9600	2000	0.43	0.09	70.6	60.5	14.6	20.6	C

Segment 12: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	3929	9600	0.41	75.4	13.0	B

Segment 13: Weaving

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	4640	6685	0.70	64.5	14.5	B

Segment 14: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	3635	9600	0.38	75.4	12.1	B

Segment 15: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	4049	414	9600	2000	0.42	0.21	69.8	66.2	14.5	13.7	B

Segment 16: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	4046	871	9600	2000	0.42	0.44	67.2	58.5	15.1	19.6	B

Segment 17: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	3182	9600	0.33	75.4	10.6	A

Segment 18: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	3374	192	9600	2000	0.35	0.10	70.4	66.4	12.0	10.6	B

Segment 19: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	0.990	3372	925	9600	2000	0.35	0.46	66.3	58.3	12.7	17.3	B

Segment 20: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	2463	9600	0.26	75.4	8.2	A

Segment 21: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	2970	507	9014	1878	0.33	0.27	66.2	64.1	11.2	12.0	B

Segment 22: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	1.000	3020	7200	0.42	71.7	14.0	B

Segment 23: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	2967	4472	0.66	66.2	22.4	C

Segment 24: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	2967	3628	0.82	49.0	30.3	D

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	70.5	14.7	14.1	6.5	B

Facility Overall Results

Space Mean Speed, mi/h	70.5	Density, veh/mi/ln	14.1
Average Travel Time, min	6.5		

HCS7 Freeway Facilities Report

Project Information

Analyst	W-Trans	Agency	
Jurisdiction	City of Novato	Time Period Analyzed	AM Peak Cumulative with Project - Southbound
Analysis Year	2016	Date	6/8/17
Project Description	City of Novato General Plan EIR		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	24
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	N Novato City Limits->San Marin Dr	3200	3
2	Diverge	Diverge	San Marin Dr Off->	1500	3
3	Basic	Basic	San Marin Dr Off->San Marin Dr On	2100	3
4	Merge	Merge	San Marin Dr On->	1175	3
5	Diverge	Diverge	De Long Ave Off->	1175	3
6	Basic	Basic	De Long Ave Off->De Long Ave On	1975	3
7	Merge	Merge	De Long Ave On->	1170	3
8	Diverge	Diverge	BEGIN HOV	200	3
9	Diverge	Diverge	Rowland Blvd Off->	1170	3
10	Basic	Basic	Rowland Blvd Off->Rowland Blvd On	3150	3
11	Merge	Merge	Rowland Blvd On->	1200	3
12	Basic	Basic	Rowland Blvd->SR37-Novato Blvd	770	3
13	Diverge	Diverge	SR37-Novato Blvd Off->	1200	3
14	Basic	Basic	SR37-Novato Blvd Off->SR37-Novato Blvd On	3400	3
15	Merge	Basic	SR37-Novato Blvd On->	1030	4
16	Diverge	Diverge	Ignacio-Enfrente Off->	1000	4
17	Diverge	Basic	BMK-Nave Off->	800	4
18	Basic	Basic	Ignacio Blvd Off->Ignacio Blvd On	1425	3
19	Merge	Merge	Ignacio Blvd On->	1500	3
20	Basic	Basic	Ignacio Blvd->Alameda Del Prado	2250	3
21	Diverge	Diverge	ADP Off->	1500	3
22	Basic	Basic	ADP Off->ADP On	1200	3
23	Merge	Basic	ADP On->	1500	3
24	Basic	Basic	Alameda Del Prado->S Novato City Limits	1000	4

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.957	6726	7200	1.02	41.1	54.6	F

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.957	0.980	6659	729	7200	2000	1.02	0.36	45.5	61.1	48.8	42.7	F

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.954	5730	7200	0.92	31.1	61.4	F

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.960	0.980	6456	776	7200	2100	1.02	0.37	38.7	51.8	55.6	39.6	F

Segment 5: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.960	0.980	6406	350	7200	2000	1.02	0.18	37.3	62.2	57.2	42.4	F

Segment 6: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.958	5928	7200	0.97	29.6	66.8	F

Segment 7: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.963	0.980	6704	776	7200	2000	1.08	0.39	60.1	56.4	37.2	36.5	F

Segment 8: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	1.00	0.963	0.990	6704	1091	7200	2200	1.08	0.50	70.0	66.5	31.9	41.6	F

Segment 9: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	

1	0.98	0.95	0.963	0.980	5613	867	7200	2000	0.92	0.43	66.1	60.7	28.3	34.5	D

Segment 10: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98		0.960		4746		7200		0.80		71.5		22.1		C

Segment 11: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.966	0.980	5451	705	7200	2000	0.89	0.35	64.1	61.2	28.3	30.5	D

Segment 12: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98		0.966		5451		7200		0.89		67.8		26.8		D

Segment 13: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.966	0.962	5451	327	7200	2100	0.89	0.16	69.1	64.5	26.3	33.0	D

Segment 14: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98		0.967		5105		7200		0.85		69.7		24.4		C

Segment 15: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.966	0.962	7960	3076	9600	4000	0.64	0.77	42.2	-	47.2	-	F

Segment 16: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.966	0.980	7812	663	9600	2000	0.95	0.33	40.5	61.3	48.2	37.0	F

Segment 17: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.964	0.980	7009	1247	9600	2000	0.88	0.62	27.4	-	63.9	-	F

Segment 18: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.98		0.962		5635		7200		1.00		25.8		72.8		F

Segment 19: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.965	0.980	6247	699	7200	2000	1.10	0.35	34.9	41.8	59.6	43.9	F

Segment 20: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.98		0.965		6118		7200		1.10		32.5		62.7		F

Segment 21: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.932	0.980	6031	215	7200	2000	1.14	0.11	30.3	62.6	66.4	47.3	F

Segment 22: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.98		0.931		5735		7200		1.11		26.1		73.3		F

Segment 23: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.934	0.980	6704	969	7200	2000	1.10	0.48	60.3	-	37.1	-	F

Segment 24: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
1	0.98		0.934		6704		9600		0.93		70.1		23.9		C

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	41.5	46.7	44.7	10.0	F

Facility Overall Results

Space Mean Speed, mi/h	41.5	Density, veh/mi/ln	44.7
Average Travel Time, min	10.0		

HCS7 Freeway Facilities Report

Project Information

Analyst	W-Trans	Agency	
Jurisdiction	City of Novato	Time Period Analyzed	PM Peak Cumulative with Project - Northbound
Analysis Year	2016	Date	6/8/17
Project Description	City of Novato General Plan Update EIR		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	23
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	Novato S City Limits->Alameda del Prado	2000	4
2	Diverge	Basic	Alameda del Prado Off->	1500	4
3	Basic	Basic	Alameda del Prado Off->Alameda del Prado On	2000	3
4	Merge	Merge	Alameda del Prado On->	1000	3
5	Basic	Basic	Alameda del Prado On->Nave Off	2600	3
6	Diverge	Diverge	Nave Off->	1000	3
7	Basic	Basic	Nave Off->Nave On	2000	3
8	Merge	Basic	Nave On->	500	4
9	Merge	Merge	Ignacio On->	1500	4
10	Diverge	Basic	SR37 Off->	1500	4
11	Diverge	Diverge	Novato Blvd Off->	1500	3
12	Basic	Basic	Novato Blvd Off->SR 37 On	2650	3
13	Weaving	Weaving	SR37->Rowland Blvd	2050	4
14	Basic	Basic	Rowland Blvd Off->Rowland Blvd On	2900	3
15	Merge	Merge	Rowland Blvd On->	1200	3
16	Diverge	Diverge	De Long Off->	1200	3
17	Basic	Basic	De Long Off->De Long On	2000	3
18	Merge	Merge	De Long Ave On->	1200	3
19	Diverge	Diverge	Atherton Ave Off->	1200	3
20	Basic	Basic	Atherton Ave Off->Atherton Ave On	900	3
21	Merge	Merge	Atherton Ave On->	1000	3
22	Merge	Merge	End HOV	1000	3
23	Basic	Basic	End HOV -> Begin 2 lane fwy	5100	2

Facility Segment Data

Segment 1: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00		0.957		7602		9600		0.90		25.3		75.2		F

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	7405	933	9600	2000	0.90	0.47	25.0	-	74.1	-	F

Segment 3: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00		0.957		6397		7200		1.07		35.2		60.6		F

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	6704	307	7200	2000	1.11	0.15	61.1	57.9	36.6	34.9	F

Segment 5: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00		0.957		6704		7200		1.11		58.2		38.4		F

Segment 6: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	1.00	0.957	1.000	6704	959	7200	2000	1.11	0.48	64.1	58.2	34.9	37.8	F

Segment 7: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00		0.957		5745		7200		0.98		65.9		29.1		D

Segment 8: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	6000	255	9600	2000	0.73	0.13	67.9	-	22.1	-	C

Segment 9: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	7617	1617	9600	2000	0.93	0.81	63.3	57.9	30.1	34.9	D

Segment 10: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	7617	2823	9600	4200	0.92	0.67	65.7	-	29.0	-	D

Segment 11: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	4794	397	7200	2000	0.84	0.20	65.6	59.9	24.4	31.2	D

Segment 12: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	4397	7200	0.79	72.8	20.1	C

Segment 13: Weaving

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	4790	4790	1.14	26.6	45.0	F

Segment 14: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	3655	7200	0.69	74.5	16.3	B

Segment 15: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	4295	640	7200	2000	0.77	0.32	67.0	64.7	21.4	21.3	C

Segment 16: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	4295	1905	7200	2000	0.77	0.95	60.2	55.4	23.8	28.2	D

Segment 17: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	2390	7200	0.51	74.3	10.6	A

Segment 18: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	2714	324	7200	2000	0.56	0.16	68.7	66.2	13.2	13.0	B

Segment 19: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	0.990	2714	1315	7200	2000	0.56	0.66	60.8	57.2	14.9	19.1	B

Segment 20: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	1399	7200	0.38	72.7	6.2	A

Segment 21: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	2376	977	6761	1878	0.55	0.52	65.8	64.3	12.0	10.1	B

Segment 22: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	3049	868	6761	1878	0.67	0.46	14.8	60.4	68.9	26.2	F

Segment 23: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	3049	3274	1.39	55.6	21.1	F

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	46.5	33.3	31.9	9.7	F

Facility Overall Results

Space Mean Speed, mi/h	46.5	Density, veh/mi/ln	31.9
Average Travel Time, min	9.7		

HCS7 Freeway Facilities Report

Project Information

Analyst	W-Trans	Agency	
Jurisdiction	City of Novato	Time Period Analyzed	PM Cumulative with Project - Southbound
Analysis Year	2016	Date	6/8/17
Project Description			

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	24
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	N Novato City Limits->San Marin Dr	3771	3
2	Diverge	Diverge	San Marin Dr Off->	1500	3
3	Basic	Basic	San Marin Dr Off->San Marin Dr On	2100	3
4	Merge	Merge	San Marin Dr On->	1175	3
5	Diverge	Diverge	De Long Ave Off->	1175	3
6	Basic	Basic	De Long Ave Off->De Long Ave On	1975	3
7	Merge	Basic	De Long Ave On->	1170	3
8	Diverge	Diverge	BEGIN HOV	200	4
9	Diverge	Diverge	Rowland Blvd Off->	1170	4
10	Basic	Basic	Rowland Blvd Off->Rowland Blvd On	3150	4
11	Merge	Merge	Rowland Blvd On->	1200	4
12	Basic	Basic	Rowland Blvd->SR37-Novato Blvd	770	4
13	Diverge	Diverge	SR37-Novato Blvd Off->	1200	4
14	Basic	Basic	SR37-Novato Blvd Off->SR37-Novato Blvd On	3400	4
15	Merge	Basic	SR37-Novato Blvd On->	1030	5
16	Diverge	Diverge	Ignacio-Enfrente Off->	1000	5
17	Diverge	Basic	BMK-Nave Off->	800	5
18	Basic	Basic	Ignacio Blvd Off->Ignacio Blvd On	1425	4
19	Merge	Merge	Ignacio Blvd On->	1500	4
20	Basic	Basic	Ignacio Blvd->Alameda Del Prado	2250	4
21	Diverge	Diverge	ADP Off->	1500	4
22	Basic	Basic	ADP Off->ADP On	1200	4
23	Merge	Merge	ADP On->	1500	4
24	Basic	Basic	Alameda Del Prado->S Novato City Limits	1000	4

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.957	4016	7200	0.56	74.0	18.1	C

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.957	0.980	4016	445	7200	2000	0.56	0.22	63.9	58.0	20.9	26.4	C

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.954	3585	7200	0.50	74.9	16.0	B

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.960	0.980	4743	1180	7200	2000	0.66	0.59	64.8	62.1	24.4	28.6	D

Segment 5: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.960	0.980	4731	222	7200	2000	0.66	0.11	67.8	62.6	23.3	28.9	D

Segment 6: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.958	4520	7200	0.63	72.4	20.8	C

Segment 7: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.963	0.980	5660	1163	7200	2000	0.62	0.58	66.4	-	28.4	-	D

Segment 8: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	1.00	0.963	0.990	5645	0	9600	2200	0.59	0.00	75.2	69.8	18.8	27.5	C

Segment 9: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	

1	0.98	0.95	0.963	0.980	5645	532	9600	2000	0.59	0.27	70.3	61.7	20.1	27.1	C

Segment 10: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.960	5136	9600	0.54	74.4	17.3	B

Segment 11: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.966	0.980	6573	1469	9600	2000	0.68	0.73	65.6	61.1	25.0	30.4	D

Segment 12: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.966	6549	9600	0.68	70.7	23.2	C

Segment 13: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.966	0.962	6549	754	9600	2100	0.68	0.36	70.7	63.2	23.2	31.6	D

Segment 14: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.967	5815	9600	0.61	73.0	19.9	C

Segment 15: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.966	0.962	7409	1588	12000	4000	0.49	0.40	72.7	-	20.4	-	C

Segment 16: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.966	0.980	7354	613	12000	2000	0.61	0.31	70.6	61.4	16.7	24.8	C

Segment 17: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.964	0.980	6765	857	12000	2000	0.56	0.43	73.9	-	18.3	-	C

Segment 18: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.962	5933	9600	0.62	72.7	20.4	C

Segment 19: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.965	0.980	7013	1099	9600	2000	0.73	0.55	65.8	61.3	26.6	30.2	D

Segment 20: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.965	6996	9600	0.73	69.0	25.3	C

Segment 21: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.932	0.980	7244	347	9600	2000	0.75	0.17	70.2	62.2	25.8	29.0	D

Segment 22: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.931	6897	9600	0.72	69.4	24.8	C

Segment 23: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.934	0.980	7603	728	9600	2000	0.79	0.36	67.3	64.5	28.2	22.9	C

Segment 24: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.934	7616	9600	0.79	66.1	28.8	D

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	70.2	21.8	20.8	6.0	C

Facility Overall Results

Space Mean Speed, mi/h	70.2	Density, veh/mi/ln	20.8
Average Travel Time, min	6.0		

HCS7 Basic Freeway Report

Project Information

Analyst	W-Trans	Date	6/9/2017
Agency		Analysis Year	2017
Jurisdiction	City of Novato	Time Period Analyzed	AM Peak Hour - Eastbound
Project Description			

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	0.80
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	72.7
Right-Side Lateral Clearance, ft	6		

Adjustment Factors

Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.968
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Volume (V), veh/h	1030	Heavy Vehicle Adjustment Factor (f_{HV})	0.971
Peak Hour Factor (PHF)	0.95	Flow Rate (v_p), pc/h/ln	558
Total Trucks, %	3.00	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2323
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.24
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	70.9
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	7.9
Total Ramp Density Adjustment	2.7	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	70.9		

HCS7 Basic Freeway Report

Project Information

Analyst	W-Trans	Date	6/9/2017
Agency		Analysis Year	2017
Jurisdiction	City of Novato	Time Period Analyzed	AM Peak Hour - Westbound
Project Description			

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	0.80
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	72.7
Right-Side Lateral Clearance, ft	6		

Adjustment Factors

Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.968
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Volume (V), veh/h	2267	Heavy Vehicle Adjustment Factor (f_{HV})	0.971
Peak Hour Factor (PHF)	0.95	Flow Rate (v_p), pc/h/ln	1229
Total Trucks, %	3.00	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2323
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.53
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	70.7
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	17.4
Total Ramp Density Adjustment	2.7	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	70.9		

HCS7 Basic Freeway Report

Project Information

Analyst	W-Trans	Date	6/9/2017
Agency		Analysis Year	2017
Jurisdiction	City of Novato	Time Period Analyzed	PM Peak Hour - Eastbound
Project Description			

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	0.80
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	72.7
Right-Side Lateral Clearance, ft	6		

Adjustment Factors

Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.968
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Volume (V), veh/h	2370	Heavy Vehicle Adjustment Factor (f_{HV})	0.971
Peak Hour Factor (PHF)	0.95	Flow Rate (v_p), pc/h/ln	1284
Total Trucks, %	3.00	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2323
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.55
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	70.4
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	18.2
Total Ramp Density Adjustment	2.7	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	70.9		

HCS7 Basic Freeway Report

Project Information

Analyst	W-Trans	Date	6/9/2017
Agency		Analysis Year	2017
Jurisdiction	City of Novato	Time Period Analyzed	PM Peak Hour - Westbound
Project Description			

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	0.80
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	72.7
Right-Side Lateral Clearance, ft	6		

Adjustment Factors

Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.968
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Volume (V), veh/h	1288	Heavy Vehicle Adjustment Factor (f_{HV})	0.971
Peak Hour Factor (PHF)	0.95	Flow Rate (v_p), pc/h/ln	698
Total Trucks, %	3.00	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2323
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.30
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	70.9
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	9.8
Total Ramp Density Adjustment	2.7	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	70.9		

HCS7 Basic Freeway Report

Project Information

Analyst	W-Trans	Date	6/9/2017
Agency		Analysis Year	2017
Jurisdiction	City of Novato	Time Period Analyzed	AM Peak Existing+Project - Eastbound
Project Description			

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	0.80
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	72.7
Right-Side Lateral Clearance, ft	6		

Adjustment Factors

Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.968
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Volume (V), veh/h	1091	Heavy Vehicle Adjustment Factor (f_{HV})	0.971
Peak Hour Factor (PHF)	0.95	Flow Rate (v_p), pc/h/ln	592
Total Trucks, %	3.00	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2323
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.25
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	70.9
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	8.3
Total Ramp Density Adjustment	2.7	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	70.9		

HCS7 Basic Freeway Report

Project Information

Analyst	W-Trans	Date	6/9/2017
Agency		Analysis Year	2017
Jurisdiction	City of Novato	Time Period Analyzed	AM Peak Existing+Project - Westbound
Project Description			

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	0.80
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	72.7
Right-Side Lateral Clearance, ft	6		

Adjustment Factors

Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.968
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Volume (V), veh/h	2411	Heavy Vehicle Adjustment Factor (f_{HV})	0.971
Peak Hour Factor (PHF)	0.95	Flow Rate (v_p), pc/h/ln	1307
Total Trucks, %	3.00	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2323
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.56
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	70.3
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	18.6
Total Ramp Density Adjustment	2.7	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	70.9		

HCS7 Basic Freeway Report

Project Information

Analyst	W-Trans	Date	6/9/2017
Agency		Analysis Year	2017
Jurisdiction	City of Novato	Time Period Analyzed	PM Peak Existing+Project - Eastbound
Project Description			

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	0.80
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	72.7
Right-Side Lateral Clearance, ft	6		

Adjustment Factors

Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.968
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Volume (V), veh/h	2524	Heavy Vehicle Adjustment Factor (f_{HV})	0.971
Peak Hour Factor (PHF)	0.95	Flow Rate (v_p), pc/h/ln	1368
Total Trucks, %	3.00	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2323
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.59
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	69.9
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	19.6
Total Ramp Density Adjustment	2.7	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	70.9		

HCS7 Basic Freeway Report

Project Information

Analyst	W-Trans	Date	6/9/2017
Agency		Analysis Year	2017
Jurisdiction	City of Novato	Time Period Analyzed	PM Peak Existing+Project - Westbound
Project Description			

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	0.80
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	72.7
Right-Side Lateral Clearance, ft	6		

Adjustment Factors

Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.968
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Volume (V), veh/h	1375	Heavy Vehicle Adjustment Factor (f_{HV})	0.971
Peak Hour Factor (PHF)	0.95	Flow Rate (v_p), pc/h/ln	746
Total Trucks, %	3.00	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2323
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.32
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	70.9
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	10.5
Total Ramp Density Adjustment	2.7	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	70.9		

HCS7 Basic Freeway Report

Project Information

Analyst	W-Trans	Date	6/9/2017
Agency		Analysis Year	2017
Jurisdiction	City of Novato	Time Period Analyzed	AM Peak Cumulative with Project - Eastbound
Project Description			

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	0.80
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	72.7
Right-Side Lateral Clearance, ft	6		

Adjustment Factors

Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.968
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Volume (V), veh/h	1154	Heavy Vehicle Adjustment Factor (f_{HV})	0.971
Peak Hour Factor (PHF)	0.95	Flow Rate (v_p), pc/h/ln	626
Total Trucks, %	3.00	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2323
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.27
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	70.9
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	8.8
Total Ramp Density Adjustment	2.7	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	70.9		

HCS7 Basic Freeway Report

Project Information

Analyst	W-Trans	Date	6/9/2017
Agency		Analysis Year	2017
Jurisdiction	City of Novato	Time Period Analyzed	AM Peak Cumulative with Project - Westbound
Project Description			

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	0.80
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	72.7
Right-Side Lateral Clearance, ft	6		

Adjustment Factors

Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.968
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Volume (V), veh/h	2585	Heavy Vehicle Adjustment Factor (f_{HV})	0.971
Peak Hour Factor (PHF)	0.95	Flow Rate (v_p), pc/h/ln	1401
Total Trucks, %	3.00	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2323
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.60
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	69.7
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	20.1
Total Ramp Density Adjustment	2.7	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	70.9		

HCS7 Basic Freeway Report

Project Information

Analyst	W-Trans	Date	6/9/2017
Agency		Analysis Year	2017
Jurisdiction	City of Novato	Time Period Analyzed	PM Peak Cumulative with Project - Eastbound
Project Description			

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	0.80
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	72.7
Right-Side Lateral Clearance, ft	6		

Adjustment Factors

Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.968
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Volume (V), veh/h	2761	Heavy Vehicle Adjustment Factor (f_{HV})	0.971
Peak Hour Factor (PHF)	0.95	Flow Rate (v_p), pc/h/ln	1496
Total Trucks, %	3.00	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2323
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.64
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	68.8
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	21.7
Total Ramp Density Adjustment	2.7	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	70.9		

HCS7 Basic Freeway Report

Project Information

Analyst	W-Trans	Date	6/9/2017
Agency		Analysis Year	2017
Jurisdiction	City of Novato	Time Period Analyzed	PM Peak Cumulative with Project - Westbound
Project Description			

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	0.80
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	72.7
Right-Side Lateral Clearance, ft	6		

Adjustment Factors

Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.968
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Volume (V), veh/h	1479	Heavy Vehicle Adjustment Factor (f_{HV})	0.971
Peak Hour Factor (PHF)	0.95	Flow Rate (v_p), pc/h/ln	802
Total Trucks, %	3.00	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2323
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.35
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	70.9
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	11.3
Total Ramp Density Adjustment	2.7	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	70.9		

Project Alternative Intersection Level of Service Calculations

Intersection	
Intersection Delay, s/veh	45.9
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	15	527	129	191	458	9	113	12	315	29	13	15
Future Vol, veh/h	15	527	129	191	458	9	113	12	315	29	13	15
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	16	567	139	205	492	10	122	13	339	31	14	16
Number of Lanes	1	2	0	1	2	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	3	3
HCM Control Delay	61.5	34.4	42.9	17.2
HCM LOS	F	D	E	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1
Vol Left, %	90%	0%	100%	0%	0%	100%	0%	0%	51%
Vol Thru, %	10%	0%	0%	100%	58%	0%	100%	94%	23%
Vol Right, %	0%	100%	0%	0%	42%	0%	0%	6%	26%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	125	315	15	351	305	191	305	162	57
LT Vol	113	0	15	0	0	191	0	0	29
Through Vol	12	0	0	351	176	0	305	153	13
RT Vol	0	315	0	0	129	0	0	9	15
Lane Flow Rate	134	339	16	378	328	205	328	174	61
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.394	0.883	0.045	1	0.839	0.569	0.861	0.454	0.2
Departure Headway (Hd)	10.559	9.38	10.054	9.532	9.223	9.797	9.294	9.254	11.637
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	345	390	357	382	393	370	391	391	310
Service Time	8.187	7.045	7.777	7.255	6.946	7.497	6.994	6.954	9.337
HCM Lane V/C Ratio	0.388	0.869	0.045	0.99	0.835	0.554	0.839	0.445	0.197
HCM Control Delay	19.8	52.1	13.3	77.8	45	24.7	48.4	19.4	17.2
HCM Lane LOS	C	F	B	F	E	C	E	C	C
HCM 95th-tile Q	1.8	8.8	0.1	11.9	7.8	3.4	8.3	2.3	0.7

MOVEMENT SUMMARY

Site: 1 [AM E+P Alt]

Simmons Lane/San Marin Drive
AM Existing plus Project Alternative

Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NB Simmons Ln											
3	L2	122	2.0	0.662	17.7	LOS B	5.1	129.3	0.83	0.96	28.6
8	T1	13	2.0	0.662	17.7	LOS B	5.1	129.3	0.83	0.96	28.6
18	R2	339	2.0	0.662	17.7	LOS B	5.1	129.3	0.83	0.96	28.0
Approach		473	2.0	0.662	17.7	LOS B	5.1	129.3	0.83	0.96	28.2
East: WB San Marin Drive											
1	L2	205	2.0	0.170	4.4	LOS A	0.7	18.7	0.30	0.17	32.6
6	T1	492	2.0	0.415	7.1	LOS A	2.4	60.6	0.39	0.25	33.7
16	R2	10	2.0	0.415	7.1	LOS A	2.4	60.6	0.39	0.25	32.8
Approach		708	2.0	0.415	6.4	LOS A	2.4	60.6	0.36	0.23	33.4
North: SB Simmons Ln											
7	L2	31	2.0	0.090	6.2	LOS A	0.3	7.8	0.57	0.56	32.9
4	T1	14	2.0	0.090	6.2	LOS A	0.3	7.8	0.57	0.56	32.9
14	R2	16	2.0	0.090	6.2	LOS A	0.3	7.8	0.57	0.56	32.1
Approach		61	2.0	0.090	6.2	LOS A	0.3	7.8	0.57	0.56	32.7
West: EB San Marin Drive											
5	L2	16	2.0	0.692	14.3	LOS B	7.1	179.4	0.76	0.68	30.5
2	T1	567	2.0	0.692	14.3	LOS B	7.1	179.4	0.76	0.68	30.5
12	R2	139	2.0	0.692	14.3	LOS B	7.1	179.4	0.76	0.68	29.8
Approach		722	2.0	0.692	14.3	LOS B	7.1	179.4	0.76	0.68	30.4
All Vehicles		1963	2.0	0.692	12.0	LOS B	7.1	179.4	0.63	0.58	30.9

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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LANE SUMMARY

Site: 1 [AM E+P Alt]

Simmons Lane/San Marin Drive
AM Existing plus Project Alternative

Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: NB Simmons Ln													
Lane 1[d]	473	2.0	714	0.662	100	17.7	LOS B	5.1	129.3	Full	1600	0.0	0.0
Approach	473	2.0		0.662		17.7	LOS B	5.1	129.3				
East: WB San Marin Drive													
Lane 1	205	2.0	1211	0.170	100	4.4	LOS A	0.7	18.7	Short	100	0.0	NA
Lane 2[d]	502	2.0	1211	0.415	100	7.1	LOS A	2.4	60.6	Full	1600	0.0	0.0
Approach	708	2.0		0.415		6.4	LOS A	2.4	60.6				
North: SB Simmons Ln													
Lane 1[d]	61	2.0	684	0.090	100	6.2	LOS A	0.3	7.8	Full	1600	0.0	0.0
Approach	61	2.0		0.090		6.2	LOS A	0.3	7.8				
West: EB San Marin Drive													
Lane 1[d]	722	2.0	1043	0.692	100	14.3	LOS B	7.1	179.4	Full	1600	0.0	0.0
Approach	722	2.0		0.692		14.3	LOS B	7.1	179.4				
Intersection	1963	2.0		0.692		12.0	LOS B	7.1	179.4				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Organisation: W-TRANS | Processed: Tuesday, June 13, 2017 3:12:45 PM
Project: N:\AAA\MAX\NOV\126NOV\SIDRA\Simmons-San Marin.sip7

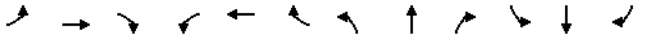
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	527	129	191	458	9	113	12	315	29	13	15
Future Volume (vph)	15	527	129	191	458	9	113	12	315	29	13	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.98	
Satd. Flow (prot)	1787	1881	1599	1787	1881	1599		1800	1599		1770	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.77	1.00		0.83	
Satd. Flow (perm)	1787	1881	1599	1787	1881	1599		1445	1599		1498	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	16	567	139	205	492	10	122	13	339	31	14	16
RTOR Reduction (vph)	0	0	62	0	0	4	0	0	104	0	13	0
Lane Group Flow (vph)	16	567	77	205	492	6	0	135	235	0	48	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	pm+ov	Perm	NA	
Protected Phases	7	4		3	8			2	3		6	
Permitted Phases			4			8	2		2	6		
Actuated Green, G (s)	0.6	28.4	28.4	12.7	40.5	40.5		13.1	25.8		13.1	
Effective Green, g (s)	0.6	28.4	28.4	12.7	40.5	40.5		13.1	25.8		13.1	
Actuated g/C Ratio	0.01	0.43	0.43	0.19	0.61	0.61		0.20	0.39		0.20	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	
Lane Grp Cap (vph)	16	806	685	342	1150	978		285	719		296	
v/s Ratio Prot	0.01	c0.30		c0.11	0.26				c0.06			
v/s Ratio Perm			0.05			0.00		c0.09	0.08		0.03	
v/c Ratio	1.00	0.70	0.11	0.60	0.43	0.01		0.47	0.33		0.16	
Uniform Delay, d1	32.8	15.5	11.3	24.4	6.8	5.0		23.5	14.1		22.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2	225.0	2.8	0.1	2.8	0.3	0.0		1.2	0.3		0.3	
Delay (s)	257.8	18.3	11.4	27.2	7.0	5.0		24.7	14.4		22.3	
Level of Service	F	B	B	C	A	A		C	B		C	
Approach Delay (s)		22.2			12.9			17.3			22.3	
Approach LOS		C			B			B			C	

Intersection Summary			
HCM 2000 Control Delay	17.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	66.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	60.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
2: W Campus Dr & San Marin Dr

11/22/2017



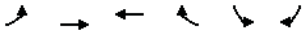
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	890	2	2	669	77	1	0	4	8	0	1
Future Volume (vph)	13	890	2	2	669	77	1	0	4	8	0	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.8		4.0	4.8	4.8		4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00		0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		0.89		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99		0.95	0.95	1.00
Satd. Flow (prot)	1805	3573		1805	3574	1615		1678		1715	1715	1615
Flt Permitted	0.95	1.00		0.95	1.00	1.00		1.00		1.00	1.00	1.00
Satd. Flow (perm)	1805	3573		1805	3574	1615		1695		1805	1805	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	14	967	2	2	727	84	1	0	4	9	0	1
RTOR Reduction (vph)	0	0	0	0	0	39	0	5	0	0	0	1
Lane Group Flow (vph)	14	969	0	2	727	45	0	0	0	4	5	0
Confl. Peds. (#/hr)			2									
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8			4		4
Actuated Green, G (s)	0.8	16.4		0.7	16.3	16.3		0.8		0.8	0.8	0.8
Effective Green, g (s)	0.8	16.4		0.7	16.3	16.3		0.8		0.8	0.8	0.8
Actuated g/C Ratio	0.03	0.53		0.02	0.53	0.53		0.03		0.03	0.03	0.03
Clearance Time (s)	4.0	4.8		4.0	4.8	4.8		4.0		4.0	4.0	4.0
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0		2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	47	1908		41	1897	857		44		47	47	42
v/s Ratio Prot	c0.01	c0.27		0.00	0.20							
v/s Ratio Perm						0.03		0.00		0.00	c0.00	0.00
v/c Ratio	0.30	0.51		0.05	0.38	0.05		0.00		0.09	0.11	0.00
Uniform Delay, d1	14.7	4.6		14.7	4.2	3.5		14.6		14.6	14.6	14.6
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	1.3	0.3		0.2	0.2	0.0		0.0		0.3	0.4	0.0
Delay (s)	16.0	4.9		14.9	4.4	3.5		14.6		14.9	15.0	14.6
Level of Service	B	A		B	A	A		B		B	B	B
Approach Delay (s)		5.0			4.3			14.6			14.9	
Approach LOS		A			A			B			B	

Intersection Summary				
HCM 2000 Control Delay	4.8	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.48			
Actuated Cycle Length (s)	30.7	Sum of lost time (s)	12.8	
Intersection Capacity Utilization	45.8%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: San Marin Dr & E Campus Drive

11/22/2017



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	0	903	747	20	11	0
Future Volume (vph)	0	903	747	20	11	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.3	4.3	4.3	3.0	
Lane Util. Factor		0.95	0.95	1.00	0.97	
Frpb, ped/bikes		1.00	1.00	1.00	1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00	
Frt		1.00	1.00	0.85	1.00	
Flt Protected		1.00	1.00	1.00	0.95	
Satd. Flow (prot)		3574	3574	1615	3502	
Flt Permitted		1.00	1.00	1.00	0.95	
Satd. Flow (perm)		3574	3574	1615	3502	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	982	812	22	12	0
RTOR Reduction (vph)	0	0	0	3	0	0
Lane Group Flow (vph)	0	982	812	19	12	0
Confl. Peds. (#/hr)						1
Heavy Vehicles (%)	0%	1%	1%	0%	0%	0%
Turn Type	Prot	NA	NA	Perm	Perm	Perm
Protected Phases	5	2	6			
Permitted Phases				6	4	4
Actuated Green, G (s)		115.1	115.1	115.1	7.6	
Effective Green, g (s)		115.1	115.1	115.1	7.6	
Actuated g/C Ratio		0.89	0.89	0.89	0.06	
Clearance Time (s)		4.3	4.3	4.3	3.0	
Vehicle Extension (s)		4.0	4.0	4.0	2.0	
Lane Grp Cap (vph)		3164	3164	1429	204	
v/s Ratio Prot		c0.27	0.23			
v/s Ratio Perm				0.01	c0.00	
v/c Ratio		0.31	0.26	0.01	0.06	
Uniform Delay, d1		1.2	1.1	0.9	57.8	
Progression Factor		1.00	0.91	1.09	1.00	
Incremental Delay, d2		0.3	0.1	0.0	0.0	
Delay (s)		1.4	1.1	0.9	57.9	
Level of Service		A	A	A	E	
Approach Delay (s)		1.4	1.1		57.9	
Approach LOS		A	A		E	

Intersection Summary			
HCM 2000 Control Delay	1.6	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.30		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	10.3
Intersection Capacity Utilization	37.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
4: Redwood Blvd & San Marin Dr 11/22/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	67	686	165	352	589	670	134	133	302	167	58	43
Future Volume (vph)	67	686	165	352	589	670	134	133	302	167	58	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.6		3.0	4.0		4.3	4.3	4.3	4.3	4.3	
Lane Util. Factor	1.00	0.91		1.00	0.91		0.97	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	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	1.00	
Frt	1.00	0.97		1.00	0.92		1.00	1.00	0.85	1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1787	4971		1752	4726		3467	1881	1568	1787	1748	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1787	4971		1752	4726		3467	1881	1568	1787	1748	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	71	722	174	371	620	705	141	140	318	176	61	45
RTOR Reduction (vph)	0	31	0	0	115	0	0	0	283	0	23	0
Lane Group Flow (vph)	71	865	0	371	1210	0	141	140	35	176	83	0
Confl. Peds. (#/hr)			4									5
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	1%	1%	1%	3%	1%	1%	1%	1%	3%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA		Split	NA	Perm	Split	NA	
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases					2				7			
Actuated Green, G (s)	8.2	44.8		36.5	72.7		14.4	14.4	14.4	19.1	19.1	
Effective Green, g (s)	8.2	44.8		36.5	72.7		14.4	14.4	14.4	19.1	19.1	
Actuated g/C Ratio	0.06	0.34		0.28	0.56		0.11	0.11	0.11	0.15	0.15	
Clearance Time (s)	3.0	3.6		3.0	4.0		4.3	4.3	4.3	4.3	4.3	
Vehicle Extension (s)	2.0	4.0		5.0	4.0		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	112	1713		491	2642		384	208	173	262	256	
v/s Ratio Prot	0.04	c0.17		c0.21	0.26		0.04	c0.07		c0.10	0.05	
v/s Ratio Perm									0.02			
v/c Ratio	0.63	0.50		0.76	0.46		0.37	0.67	0.20	0.67	0.32	
Uniform Delay, d1	59.4	33.8		42.7	17.0		53.6	55.5	52.6	52.5	49.7	
Progression Factor	1.15	0.93		1.05	1.07		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	8.1	1.0		6.5	0.5		0.2	6.6	0.2	5.2	0.3	
Delay (s)	76.6	32.5		51.4	18.7		53.8	62.1	52.8	57.7	49.9	
Level of Service	E	C		D	B		D	E	D	E	D	
Approach Delay (s)		35.7			25.8			55.2			54.8	
Approach LOS		D			C			E			D	

Intersection Summary				
HCM 2000 Control Delay	35.8	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.63			
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	15.6	
Intersection Capacity Utilization	90.9%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
4: Redwood Blvd & San Marin Dr 06/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	67	686	165	352	589	670	134	133	302	167	58	43
Future Volume (vph)	67	686	165	352	589	670	134	133	302	167	58	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.6		3.0	4.0	4.3	4.3	4.3	3.0	4.3	4.3	
Lane Util. Factor	1.00	0.91		0.97	0.95	1.00	0.95	0.95	0.88	0.91	0.91	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.98	
Satd. Flow (prot)	1787	4971		3400	3574	1599	1698	1779	2760	1626	3216	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.98	
Satd. Flow (perm)	1787	4971		3400	3574	1599	1698	1779	2760	1626	3216	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	71	722	174	371	620	705	141	140	318	176	61	45
RTOR Reduction (vph)	0	27	0	0	0	83	0	0	222	0	28	0
Lane Group Flow (vph)	71	869	0	371	620	622	127	154	96	95	159	0
Confl. Peds. (#/hr)			4									5
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	1%	1%	1%	3%	1%	1%	1%	1%	3%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA	pm+ov	Split	NA	
Protected Phases	5	2		1	6	4	8	8	1	4	4	
Permitted Phases						6			8			
Actuated Green, G (s)	8.8	55.1		24.0	69.9	88.9	14.7	14.7	38.7	19.0	19.0	
Effective Green, g (s)	8.8	55.1		24.0	69.9	88.9	14.7	14.7	38.7	19.0	19.0	
Actuated g/C Ratio	0.07	0.43		0.19	0.55	0.69	0.11	0.11	0.30	0.15	0.15	
Clearance Time (s)	3.0	3.6		3.0	4.0	4.3	4.3	4.3	3.0	4.3	4.3	
Vehicle Extension (s)	2.0	4.0		5.0	4.0	2.0	2.0	2.0	5.0	2.0	2.0	
Lane Grp Cap (vph)	122	2139		637	1951	1110	195	204	834	241	477	
v/s Ratio Prot	c0.04	0.17		c0.11	0.17	c0.08	0.07	c0.09	0.02	0.06	0.05	
v/s Ratio Perm						0.31			0.01			
v/c Ratio	0.58	0.41		0.58	0.32	0.56	0.65	0.75	0.12	0.39	0.33	
Uniform Delay, d1	57.8	25.2		47.4	16.0	9.8	54.2	54.9	32.3	49.3	48.8	
Progression Factor	1.00	1.00		1.03	0.58	0.70	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	4.5	0.6		1.8	0.4	0.3	5.8	13.1	0.1	0.4	0.2	
Delay (s)	62.3	25.7		50.7	9.6	7.1	60.0	68.0	32.4	49.7	49.0	
Level of Service	E	C		D	A	A	E	E	C	D	D	
Approach Delay (s)		28.4			17.6			47.4			49.2	
Approach LOS		C			B			D			D	

Intersection Summary				
HCM 2000 Control Delay	28.1	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.59			
Actuated Cycle Length (s)	128.0	Sum of lost time (s)	15.6	
Intersection Capacity Utilization	81.4%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
5: US 101 SB Ramps & San Marin Dr

11/22/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	655	502	126	1032	0	0	0	0	92	1	579
Future Volume (vph)	0	655	502	126	1032	0	0	0	0	92	1	579
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9	4.9	3.0	5.3						4.0	4.0
Lane Util. Factor		0.95	1.00	1.00	0.95						1.00	0.88
Frpb, ped/bikes		1.00	0.99	1.00	1.00						1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		3574	1575	1805	3574						1810	2814
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		3574	1575	1805	3574						1810	2814
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)	0	697	534	134	1098	0	0	0	0	98	1	616
RTOR Reduction (vph)	0	0	270	0	0	0	0	0	0	0	0	129
Lane Group Flow (vph)	0	697	264	134	1098	0	0	0	0	0	99	487
Confl. Peds. (#/hr)			4									
Heavy Vehicles (%)	0%	1%	1%	0%	1%	0%	0%	0%	0%	0%	0%	1%
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			2									4
Actuated Green, G (s)		32.1	32.1	6.6	41.3						14.4	14.4
Effective Green, g (s)		32.1	32.1	6.6	41.3						14.4	14.4
Actuated g/C Ratio		0.49	0.49	0.10	0.64						0.22	0.22
Clearance Time (s)		4.9	4.9	3.0	5.3						4.0	4.0
Vehicle Extension (s)		4.0	4.0	2.0	4.0						2.0	2.0
Lane Grp Cap (vph)		1765	777	183	2270						400	623
v/s Ratio Prot		0.20		c0.07	c0.31						0.05	
v/s Ratio Perm			0.17									c0.17
v/c Ratio		0.39	0.34	0.73	0.48						0.25	0.78
Uniform Delay, d1		10.3	10.0	28.3	6.2						20.8	23.8
Progression Factor		0.46	1.52	1.00	1.00						1.00	1.00
Incremental Delay, d2		0.6	1.0	12.2	0.7						0.1	5.8
Delay (s)		5.3	16.2	40.6	7.0						21.0	29.7
Level of Service		A	B	D	A						C	C
Approach Delay (s)		10.1			10.6			0.0			28.5	
Approach LOS		B			B			A			C	

Intersection Summary				
HCM 2000 Control Delay	14.4	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.61			
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	11.9	
Intersection Capacity Utilization	58.2%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
6: US 101 NB Ramps & San Marin Dr

11/22/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	380	364	0	0	485	86	668	0	152	0	0	0
Future Volume (vph)	380	364	0	0	485	86	668	0	152	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.6			4.9	4.9	3.5	3.5				
Lane Util. Factor	0.97	1.00			0.95	1.00	0.95	0.95				
Frpb, ped/bikes	1.00	1.00			1.00	0.99	1.00	0.99				
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00				
Frt	1.00	1.00			1.00	0.85	1.00	0.94				
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.97				
Satd. Flow (prot)	3467	1881			3574	1594	1681	1599				
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.97				
Satd. Flow (perm)	3467	1881			3574	1594	1681	1599				
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	400	383	0	0	511	91	703	0	160	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	68	0	60	0	0	0	0
Lane Group Flow (vph)	400	383	0	0	511	23	443	361	0	0	0	0
Confl. Peds. (#/hr)			3			1			1	1		
Heavy Vehicles (%)	1%	1%	0%	0%	1%	0%	2%	0%	3%	0%	0%	0%
Turn Type	Prot	NA			NA	Perm	Split	NA				
Protected Phases	5	2			6		8	8				
Permitted Phases						6						
Actuated Green, G (s)	10.2	27.6			13.6	13.6	18.9	18.9				
Effective Green, g (s)	10.2	27.6			13.6	13.6	18.9	18.9				
Actuated g/C Ratio	0.19	0.51			0.25	0.25	0.35	0.35				
Clearance Time (s)	3.5	4.6			4.9	4.9	3.5	3.5				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	2.5	2.5				
Lane Grp Cap (vph)	647	950			890	397	581	553				
v/s Ratio Prot	c0.12	0.20			c0.14		c0.26	0.23				
v/s Ratio Perm						0.01						
v/c Ratio	0.62	0.40			0.57	0.06	0.76	0.65				
Uniform Delay, d1	20.4	8.4			18.0	15.6	15.9	15.1				
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00				
Incremental Delay, d2	1.2	0.4			1.1	0.1	5.6	2.5				
Delay (s)	21.7	8.8			19.0	15.7	21.5	17.5				
Level of Service	C	A			B	B	C	B				
Approach Delay (s)		15.4			18.5			19.6			0.0	
Approach LOS		B			B			B			A	

Intersection Summary				
HCM 2000 Control Delay	17.8	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.67			
Actuated Cycle Length (s)	54.6	Sum of lost time (s)	11.9	
Intersection Capacity Utilization	58.2%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
7: Redwood Blvd & Olive St

11/22/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	102	95	32	137	126	107	17	408	132	149	390	77
Future Volume (vph)	102	95	32	137	126	107	17	408	132	149	390	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.1	5.1			5.1		4.0	3.9	3.9	4.0	3.9	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.96			0.96		1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00			0.98		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1792			1758		1770	3539	1583	1770	3451	
Flt Permitted	0.95	1.00			0.98		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1792			1758		1770	3539	1583	1770	3451	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	111	103	35	149	137	116	18	443	143	162	424	84
RTOR Reduction (vph)	0	13	0	0	12	0	0	0	106	0	14	0
Lane Group Flow (vph)	111	125	0	0	390	0	18	443	37	162	494	0
Turn Type	Split	NA		Split	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	11.6	11.6			23.8		1.5	18.0	18.0	11.6	28.1	
Effective Green, g (s)	11.6	11.6			23.8		1.5	18.0	18.0	11.6	28.1	
Actuated g/C Ratio	0.14	0.14			0.29		0.02	0.22	0.22	0.14	0.34	
Clearance Time (s)	5.1	5.1			5.1		4.0	3.9	3.9	4.0	3.9	
Vehicle Extension (s)	1.0	1.0			1.0		1.0	1.0	1.0	1.0	1.0	
Lane Grp Cap (vph)	247	250			503		31	766	342	247	1166	
v/s Ratio Prot	0.06	c0.07			c0.22		0.01	c0.13		c0.09	0.14	
v/s Ratio Perm									0.02			
v/c Ratio	0.45	0.50			0.78		0.58	0.58	0.11	0.66	0.42	
Uniform Delay, d1	32.8	33.1			27.2		40.5	29.2	26.1	33.9	21.2	
Progression Factor	1.00	1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.5	0.6			6.7		16.6	0.7	0.1	4.7	0.1	
Delay (s)	33.3	33.6			33.9		57.0	29.8	26.2	38.6	21.3	
Level of Service	C	C			C		E	C	C	D	C	
Approach Delay (s)		33.5			33.9			29.8			25.5	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM 2000 Control Delay	29.6	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.65			
Actuated Cycle Length (s)	83.1	Sum of lost time (s)	18.1	
Intersection Capacity Utilization	64.4%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
8: Redwood Blvd & Grant Ave

11/22/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	84	99	195	22	76	40	214	363	46	34	420	77
Future Volume (vph)	84	99	195	22	76	40	214	363	46	34	420	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5		3.5	3.7	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	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		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1763	1900	1564	1803	1900	1588	1805	3472		1805	3446	
Flt Permitted	0.70	1.00	1.00	0.69	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1303	1900	1564	1304	1900	1588	1805	3472		1805	3446	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	92	109	214	24	84	44	235	399	51	37	462	85
RTOR Reduction (vph)	0	0	156	0	0	32	0	8	0	0	14	0
Lane Group Flow (vph)	92	109	58	24	84	12	235	442	0	37	533	0
Confl. Peds. (#/hr)	9		11	2		1			10			9
Confl. Bikes (#/hr)			5			5			5			5
Heavy Vehicles (%)	2%	0%	1%	0%	0%	0%	0%	2%	0%	0%	2%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8		8	4		4						
Actuated Green, G (s)	17.4	17.4	17.4	17.4	17.4	17.4	15.4	32.6		3.2	20.2	
Effective Green, g (s)	17.4	17.4	17.4	17.4	17.4	17.4	15.4	32.6		3.2	20.2	
Actuated g/C Ratio	0.27	0.27	0.27	0.27	0.27	0.27	0.24	0.51		0.05	0.31	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5		3.5	3.7	
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0	4.0	2.5	3.0		2.5	3.0	
Lane Grp Cap (vph)	353	514	423	353	514	430	432	1763		89	1084	
v/s Ratio Prot		0.06			0.04		c0.13	0.13		0.02	c0.15	
v/s Ratio Perm	c0.07		0.04	0.02		0.01						
v/c Ratio	0.26	0.21	0.14	0.07	0.16	0.03	0.54	0.25		0.42	0.49	
Uniform Delay, d1	18.4	18.1	17.7	17.4	17.8	17.2	21.3	8.9		29.6	17.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.3	0.2	0.1	0.2	0.0	1.1	0.1		2.3	0.4	
Delay (s)	18.9	18.4	17.9	17.5	18.1	17.2	22.4	9.0		31.9	18.2	
Level of Service	B	B	B	B	B	B	C	A		C	B	
Approach Delay (s)		18.3			17.7			13.6			19.1	
Approach LOS		B			B			B			B	

Intersection Summary				
HCM 2000 Control Delay	16.7	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.43			
Actuated Cycle Length (s)	64.2	Sum of lost time (s)	11.2	
Intersection Capacity Utilization	54.3%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	39.8
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	62	147	60	20	176	170	111	160	50	194	95	97
Future Vol, veh/h	62	147	60	20	176	170	111	160	50	194	95	97
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	73	173	71	24	207	200	131	188	59	228	112	114
Number of Lanes	1	1	0	1	1	0	1	1	0	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	3	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	3	2	2
HCM Control Delay	25.8	81	25.5	22.4
HCM LOS	D	F	D	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%	0%
Vol Thru, %	0%	76%	0%	71%	0%	51%	0%	100%	0%
Vol Right, %	0%	24%	0%	29%	0%	49%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	111	210	62	207	20	346	194	95	97
LT Vol	111	0	62	0	20	0	194	0	0
Through Vol	0	160	0	147	0	176	0	95	0
RT Vol	0	50	0	60	0	170	0	0	97
Lane Flow Rate	131	247	73	244	24	407	228	112	114
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.369	0.649	0.208	0.645	0.065	1.033	0.632	0.293	0.276
Departure Headway (Hd)	10.464	9.763	10.573	9.841	10.01	9.137	10.269	9.746	9.015
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	346	373	341	370	360	399	354	371	401
Service Time	8.164	7.463	8.273	7.541	7.71	6.837	7.969	7.446	6.715
HCM Lane V/C Ratio	0.379	0.662	0.214	0.659	0.067	1.02	0.644	0.302	0.284
HCM Control Delay	19.2	28.8	16	28.8	13.4	84.9	29	16.4	15.1
HCM Lane LOS	C	D	C	D	B	F	D	C	C
HCM 95th-tile Q	1.7	4.4	0.8	4.3	0.2	13.2	4.1	1.2	1.1

MOVEMENT SUMMARY

Site: 9 [AM Existing + Project Alt]

Novato Boulevard/San Marin Dr-Sutro Ave
AM Existing + Project Alternative

Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NB Sutro Ave											
3	L2	121	2.0	0.407	9.1	LOS A	2.1	54.3	0.64	0.61	32.1
8	T1	174	2.0	0.407	9.1	LOS A	2.1	54.3	0.64	0.61	32.0
18	R2	54	2.0	0.407	9.1	LOS A	2.1	54.3	0.64	0.61	31.2
Approach		349	2.0	0.407	9.1	LOS A	2.1	54.3	0.64	0.61	31.9
East: WB Novato Blvd											
1	L2	22	2.0	0.429	8.9	LOS A	2.3	59.5	0.61	0.54	32.8
6	T1	191	2.0	0.429	8.9	LOS A	2.3	59.5	0.61	0.54	32.8
16	R2	185	2.0	0.429	8.9	LOS A	2.3	59.5	0.61	0.54	32.0
Approach		398	2.0	0.429	8.9	LOS A	2.3	59.5	0.61	0.54	32.4
North: SB San Marin Drive											
7	L2	211	2.0	0.308	6.6	LOS A	1.4	36.5	0.49	0.41	32.4
4	T1	103	2.0	0.308	6.6	LOS A	1.4	36.5	0.49	0.41	32.4
14	R2	105	2.0	0.103	4.4	LOS A	0.4	10.3	0.42	0.31	34.1
Approach		420	2.0	0.308	6.1	LOS A	1.4	36.5	0.47	0.38	32.8
West: EB Novato Blvd											
5	L2	67	2.0	0.307	7.0	LOS A	1.5	38.6	0.53	0.45	33.3
2	T1	160	2.0	0.307	7.0	LOS A	1.5	38.6	0.53	0.45	33.3
12	R2	65	2.0	0.307	7.0	LOS A	1.5	38.6	0.53	0.45	32.4
Approach		292	2.0	0.307	7.0	LOS A	1.5	38.6	0.53	0.45	33.1
All Vehicles		1459	2.0	0.429	7.7	LOS A	2.3	59.5	0.56	0.49	32.5

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Organisation: W-TRANS | Processed: Tuesday, June 13, 2017 3:20:24 PM
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LANE SUMMARY

Site: 9 [AM Existing + Project Alt]

Novato Boulevard/San Marin Dr-Sutro Ave
AM Existing + Project Alternative

Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: NB Sutro Ave													
Lane 1[d]	349	2.0	858	0.407	100	9.1	LOS A	2.1	54.3	Full	1600	0.0	0.0
Approach	349	2.0		0.407		9.1	LOS A	2.1	54.3				
East: WB Novato Blvd													
Lane 1[d]	398	2.0	928	0.429	100	8.9	LOS A	2.3	59.5	Full	1600	0.0	0.0
Approach	398	2.0		0.429		8.9	LOS A	2.3	59.5				
North: SB San Marin Drive													
Lane 1[d]	314	2.0	1021	0.308	100	6.6	LOS A	1.4	36.5	Full	1600	0.0	0.0
Lane 2	105	2.0	1021	0.103	100	4.4	LOS A	0.4	10.3	Short	30	0.0	NA
Approach	420	2.0		0.308		6.1	LOS A	1.4	36.5				
West: EB Novato Blvd													
Lane 1[d]	292	2.0	954	0.307	100	7.0	LOS A	1.5	38.6	Full	1600	0.0	0.0
Approach	292	2.0		0.307		7.0	LOS A	1.5	38.6				
Intersection	1459	2.0		0.429		7.7	LOS A	2.3	59.5				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Organisation: W-TRANS | Processed: Tuesday, June 13, 2017 3:20:24 PM
Project: N:\AAA\MAX\NOV\126NOV\SIDRA\Novato-San Marin.sip7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	62	147	60	20	176	170	111	160	50	194	95	97
Future Volume (vph)	62	147	60	20	176	170	111	160	50	194	95	97
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.93		1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1781		1770	1725		1770	1796		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	1781		1770	1725		1770	1796		1770	1863	1583
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	73	173	71	24	207	200	131	188	59	228	112	114
RTOR Reduction (vph)	0	16	0	0	38	0	0	14	0	0	0	78
Lane Group Flow (vph)	73	228	0	24	369	0	131	233	0	228	112	36
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	5.1	24.4		1.6	20.9		8.2	16.1		13.9	21.8	21.8
Effective Green, g (s)	5.1	24.4		1.6	20.9		8.2	16.1		13.9	21.8	21.8
Actuated g/C Ratio	0.07	0.35		0.02	0.30		0.12	0.23		0.20	0.31	0.31
Clearance Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	128	620		40	515		207	413		351	580	492
v/s Ratio Prot	c0.04	0.13		0.01	c0.21		0.07	c0.13		c0.13	0.06	
v/s Ratio Perm												0.02
v/c Ratio	0.57	0.37		0.60	0.72		0.63	0.56		0.65	0.19	0.07
Uniform Delay, d1	31.4	17.0		33.9	21.9		29.5	23.8		25.8	17.7	17.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	6.0	0.4		21.9	4.7		6.2	1.8		4.1	0.2	0.1
Delay (s)	37.4	17.4		55.8	26.6		35.6	25.6		29.9	17.8	17.0
Level of Service	D	B		E	C		D	C		C	B	B
Approach Delay (s)		22.0			28.3			29.1			23.7	
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	0.64		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	58.6%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
10: Wilson Ave & Novato Blvd

11/22/2017

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	671	17	262	464	28	458
Future Volume (vph)	671	17	262	464	28	458
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.9		3.0	3.6	3.6	3.6
Lane Util. Factor	0.95		1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3560		1787	3610	1805	1593
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3560		1787	3610	1805	1593
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	789	20	308	546	33	539
RTOR Reduction (vph)	2	0	0	0	0	209
Lane Group Flow (vph)	807	0	308	546	33	331
Confl. Peds. (#/hr)		3			6	2
Heavy Vehicles (%)	1%	0%	1%	0%	0%	0%
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases						4
Actuated Green, G (s)	32.1		17.4	39.8	20.0	20.0
Effective Green, g (s)	32.1		17.4	39.8	20.0	20.0
Actuated g/C Ratio	0.40		0.22	0.50	0.25	0.25
Clearance Time (s)	3.9		3.0	3.6	3.6	3.6
Vehicle Extension (s)	3.0		2.0	3.0	2.0	2.0
Lane Grp Cap (vph)	1428		388	1795	451	398
v/s Ratio Prot	c0.23		c0.17	0.15	0.02	
v/s Ratio Perm						c0.21
v/c Ratio	0.56		0.79	0.30	0.07	0.83
Uniform Delay, d1	18.5		29.6	11.9	22.9	28.4
Progression Factor	1.00		1.00	0.51	1.00	1.00
Incremental Delay, d2	1.6		9.5	0.4	0.0	13.1
Delay (s)	20.2		39.0	6.5	22.9	41.5
Level of Service	C		D	A	C	D
Approach Delay (s)	20.2			18.2	40.4	
Approach LOS	C			B	D	

Intersection Summary				
HCM 2000 Control Delay	24.6	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.70			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.5	
Intersection Capacity Utilization	54.3%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
11: Novato Blvd & Simmons Ln

11/22/2017

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	278	831	478	91	86	268
Future Volume (vph)	278	831	478	91	86	268
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.9	3.6		3.0	3.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	3574	3512		1805	1599
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1805	3574	3512		1805	1599
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	327	978	562	107	101	315
RTOR Reduction (vph)	0	0	16	0	0	234
Lane Group Flow (vph)	327	978	653	0	101	81
Confl. Peds. (#/hr)					2	
Confl. Bikes (#/hr)				1		
Heavy Vehicles (%)	0%	1%	0%	0%	0%	1%
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	5	2	6		8	
Permitted Phases						8
Actuated Green, G (s)	10.0	32.1	39.8		20.6	20.6
Effective Green, g (s)	10.0	32.1	39.8		20.6	20.6
Actuated g/C Ratio	0.12	0.40	0.50		0.26	0.26
Clearance Time (s)	3.0	3.9	3.6		3.0	3.0
Vehicle Extension (s)	2.0	3.0	3.0		2.0	2.0
Lane Grp Cap (vph)	225	1434	1747		464	411
v/s Ratio Prot	c0.18	c0.27	c0.19		c0.06	
v/s Ratio Perm						0.05
v/c Ratio	1.45	0.68	0.37		0.22	0.20
Uniform Delay, d1	35.0	19.7	12.4		23.4	23.2
Progression Factor	0.79	0.64	1.00		1.00	1.00
Incremental Delay, d2	222.5	2.1	0.6		0.1	0.1
Delay (s)	250.3	14.6	13.0		23.4	23.3
Level of Service	F	B	B		C	C
Approach Delay (s)		73.7	13.0		23.4	
Approach LOS		E	B		C	

Intersection Summary				
HCM 2000 Control Delay	47.9	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.57			
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	10.5	
Intersection Capacity Utilization	46.5%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
12: Novato Blvd & Grant Ave

01/23/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	199	816	3	4	415	57	1	0	2	35	1	184
Future Volume (vph)	199	816	3	4	415	57	1	0	2	35	1	184
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.5	4.5	3.5	4.9	4.9		4.0		3.5	3.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00		1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.96		0.97		1.00	0.98	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00		1.00		0.98	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.91		1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.98		0.95	1.00	
Satd. Flow (prot)	1787	1863	1576	1805	3539	1534		1644		1748	1569	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.70		0.76	1.00	
Satd. Flow (perm)	1787	1863	1576	1805	3539	1534		1175		1390	1569	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	234	960	4	5	488	67	1	0	2	41	1	216
RTOR Reduction (vph)	0	0	1	0	0	27	0	3	0	0	192	0
Lane Group Flow (vph)	234	960	3	5	488	40	0	0	0	41	25	0
Confl. Peds. (#/hr)			1			8	5		12	12		5
Confl. Bikes (#/hr)			4			2			2			1
Heavy Vehicles (%)	1%	2%	0%	0%	2%	1%	0%	0%	0%	1%	0%	1%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8			4		
Actuated Green, G (s)	16.7	76.0	76.0	1.2	60.1	60.1		10.8		11.3	11.3	
Effective Green, g (s)	16.7	76.0	76.0	1.2	60.1	60.1		10.8		11.3	11.3	
Actuated g/C Ratio	0.17	0.76	0.76	0.01	0.60	0.60		0.11		0.11	0.11	
Clearance Time (s)	3.5	4.5	4.5	3.5	4.9	4.9		4.0		3.5	3.5	
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0	3.0		2.0		2.0	2.0	
Lane Grp Cap (vph)	298	1415	1197	21	2126	921		126		157	177	
v/s Ratio Prot	c0.13	c0.52		0.00	0.14						0.02	
v/s Ratio Perm			0.00			0.03		0.00		c0.03		
v/c Ratio	0.79	0.68	0.00	0.24	0.23	0.04		0.00		0.26	0.14	
Uniform Delay, d1	39.9	5.9	2.9	48.9	9.2	8.2		39.8		40.5	40.0	
Progression Factor	1.00	1.00	1.00	0.88	0.99	1.45		1.00		1.00	1.00	
Incremental Delay, d2	11.8	1.3	0.0	2.0	0.2	0.1		0.0		0.3	0.1	
Delay (s)	51.7	7.3	2.9	45.2	9.3	11.9		39.8		40.9	40.1	
Level of Service	D	A	A	D	A	B		D		D	D	
Approach Delay (s)		15.9			10.0			39.8			40.2	
Approach LOS		B			A			D			D	

Intersection Summary					
HCM 2000 Control Delay	17.4	HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio	0.67				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		12.4	
Intersection Capacity Utilization	72.0%	ICU Level of Service		C	
Analysis Period (min)	15				
c Critical Lane Group					

HCM Signalized Intersection Capacity Analysis
13: Tamalpais Ave/7th St & Novato Blvd

01/23/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	96	727	36	60	440	121	37	99	34	72	105	45
Future Volume (vph)	96	727	36	60	440	121	37	99	34	72	105	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.0		3.5	5.0	5.0	3.5	3.5		3.5	3.5	3.5
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.95	1.00	0.99		1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.99	1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1787	1846		1787	1863	1523	1770	1798		1784	1881	1531
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.57	1.00		0.48	1.00	1.00
Satd. Flow (perm)	1787	1846		1787	1863	1523	1068	1798		902	1881	1531
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)	102	773	38	64	468	129	39	105	36	77	112	48
RTOR Reduction (vph)	0	1	0	0	0	20	0	15	0	0	0	41
Lane Group Flow (vph)	102	810	0	64	468	109	39	126	0	77	112	7
Confl. Peds. (#/hr)			11			17	6		1	1		6
Confl. Bikes (#/hr)			9			1			1			4
Heavy Vehicles (%)	1%	2%	1%	1%	2%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8			4		4
Actuated Green, G (s)	9.2	66.6		7.7	65.1	65.1	13.7	13.7		13.7	13.7	13.7
Effective Green, g (s)	9.2	66.6		7.7	65.1	65.1	13.7	13.7		13.7	13.7	13.7
Actuated g/C Ratio	0.09	0.67		0.08	0.65	0.65	0.14	0.14		0.14	0.14	0.14
Clearance Time (s)	3.5	5.0		3.5	5.0	5.0	3.5	3.5		3.5	3.5	3.5
Vehicle Extension (s)	2.0	5.0		2.0	5.0	5.0	2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	164	1229		137	1212	991	146	246		123	257	209
v/s Ratio Prot	c0.06	c0.44		0.04	0.25			0.07			0.06	
v/s Ratio Perm						0.07	0.04			c0.09		0.00
v/c Ratio	0.62	0.66		0.47	0.39	0.11	0.27	0.51		0.63	0.44	0.03
Uniform Delay, d1	43.7	9.9		44.2	8.1	6.6	38.7	40.1		40.7	39.6	37.4
Progression Factor	0.88	1.09		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	4.0	2.2		0.9	0.9	0.2	0.4	0.8		7.0	0.4	0.0
Delay (s)	42.3	13.0		45.1	9.1	6.8	39.0	40.8		47.7	40.0	37.4
Level of Service	D	B		D	A	A	D	D		D	D	D
Approach Delay (s)		16.2			12.1			40.4			42.0	
Approach LOS		B			B			D			D	

Intersection Summary					
HCM 2000 Control Delay	20.1	HCM 2000 Level of Service		C	
HCM 2000 Volume to Capacity ratio	0.66				
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		12.0	
Intersection Capacity Utilization	78.9%	ICU Level of Service		D	
Analysis Period (min)	15				
c Critical Lane Group					

HCM Signalized Intersection Capacity Analysis
14: Novato Blvd & Diablo Ave

01/23/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	234	35	200	236	317	34	294	207	443	389	28
Future Volume (vph)	22	234	35	200	236	317	34	294	207	443	389	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	11	11	12	11	11	12	12	12	12
Total Lost time (s)		3.7		4.1	4.1	4.1	4.4	4.4	4.4	4.1	4.1	
Lane Util. Factor		0.95		0.91	0.91	1.00	1.00	1.00	1.00	0.91	0.91	
Frpb, ped/bikes		1.00		1.00	1.00	0.95	1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes		1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected		1.00		0.95	0.99	1.00	0.95	1.00	1.00	0.95	0.99	
Satd. Flow (prot)		3488		1557	3271	1512	1728	1801	1557	1610	3317	
Flt Permitted		1.00		0.95	0.99	1.00	0.95	1.00	1.00	0.95	0.99	
Satd. Flow (perm)		3488		1557	3271	1512	1728	1801	1557	1610	3317	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	22	239	36	204	241	323	35	300	211	452	397	29
RTOR Reduction (vph)	0	8	0	0	0	215	0	0	163	0	2	0
Lane Group Flow (vph)	0	289	0	145	300	108	35	300	48	289	587	0
Confl. Peds. (#/hr)			7			15			2			4
Confl. Bikes (#/hr)			1			1			3			5
Heavy Vehicles (%)	1%	1%	1%	2%	1%	2%	1%	2%	2%	2%	2%	1%
Turn Type	Split	NA		Split	NA	Perm	Split	NA	Perm	Split	NA	
Protected Phases	3	3		4	4		1	1		2	2	
Permitted Phases						4			1		2	
Actuated Green, G (s)		14.3		15.0	15.0	15.0	20.2	20.2	20.2	22.5	22.5	
Effective Green, g (s)		14.3		15.0	15.0	15.0	20.2	20.2	20.2	22.5	22.5	
Actuated g/C Ratio		0.16		0.17	0.17	0.17	0.23	0.23	0.23	0.25	0.25	
Clearance Time (s)		3.7		4.1	4.1	4.1	4.4	4.4	4.4	4.1	4.1	
Vehicle Extension (s)		2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)		564		264	555	256	395	412	356	410	845	
v/s Ratio Prot		c0.08		c0.09	0.09		0.02	c0.17		c0.18	0.18	
v/s Ratio Perm						0.07			0.03			
v/c Ratio		0.51		0.55	0.54	0.42	0.09	0.73	0.14	0.70	0.69	
Uniform Delay, d1		33.8		33.6	33.5	32.8	26.8	31.5	27.1	29.9	29.8	
Progression Factor		1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.3		1.3	0.6	0.4	0.0	5.4	0.1	4.5	2.0	
Delay (s)		34.1		34.8	34.1	33.2	26.8	36.9	27.2	34.3	31.8	
Level of Service		C		C	C	C	C	D	C	C	C	
Approach Delay (s)		34.1			33.8			32.5			32.6	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM 2000 Control Delay	33.2	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.64			
Actuated Cycle Length (s)	88.3	Sum of lost time (s)	16.3	
Intersection Capacity Utilization	71.3%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
14: Novato Blvd #2/Novato Blvd & Diablo Ave

02/12/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	234	35	200	236	317	34	294	207	443	389	28
Future Volume (vph)	22	234	35	200	236	317	34	294	207	443	389	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	12	11	11	12	10	12	12
Total Lost time (s)	4.0	4.1	4.1	4.0	4.0	4.0	4.0	4.1		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		0.97	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	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		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1728	1818	1518	1711	1818	1558	1728	3187		3204	1841	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1728	1818	1518	1711	1818	1558	1728	3187		3204	1841	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	22	239	36	204	241	323	35	300	211	452	397	29
RTOR Reduction (vph)	0	0	28	0	0	138	0	128	0	0	3	0
Lane Group Flow (vph)	22	239	8	204	241	185	35	383	0	452	423	0
Confl. Peds. (#/hr)			7			15			2			4
Confl. Bikes (#/hr)			1			1			3			5
Heavy Vehicles (%)	1%	1%	1%	2%	1%	2%	1%	2%	2%	2%	2%	1%
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	1.7	18.9	18.9	13.5	30.8	47.4	3.3	17.5		16.6	30.9	
Effective Green, g (s)	1.7	18.9	18.9	13.5	30.8	47.4	3.3	17.5		16.6	30.9	
Actuated g/C Ratio	0.02	0.23	0.23	0.16	0.37	0.57	0.04	0.21		0.20	0.37	
Clearance Time (s)	4.0	4.1	4.1	4.0	4.0	4.0	4.0	4.1		4.0	4.0	
Vehicle Extension (s)	3.0	2.0	2.0	3.0	3.0	3.0	3.0	2.0		3.0	3.0	
Lane Grp Cap (vph)	35	415	346	279	677	968	68	674		643	687	
v/s Ratio Prot	0.01	c0.13		c0.12	0.13	0.04	0.02	0.12		c0.14	c0.23	
v/s Ratio Perm			0.01			0.08						
v/c Ratio	0.63	0.58	0.02	0.73	0.36	0.19	0.51	0.57		0.70	0.62	
Uniform Delay, d1	40.2	28.3	24.7	32.9	18.8	8.5	38.9	29.2		30.8	21.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	30.3	1.2	0.0	9.5	0.3	0.1	6.4	0.7		3.5	1.7	
Delay (s)	70.5	29.5	24.8	42.3	19.1	8.6	45.4	29.9		34.2	22.7	
Level of Service	E	C	C	D	B	A	D	C		C	C	
Approach Delay (s)		32.0			20.8			30.9			28.7	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM 2000 Control Delay	27.1	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.67			
Actuated Cycle Length (s)	82.7	Sum of lost time (s)	16.2	
Intersection Capacity Utilization	68.4%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
15: Redwood Blvd & Diablo Ave/De Long Ave

11/22/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	214	463	167	156	564	199	53	138	30	196	271	164
Future Volume (vph)	214	463	167	156	564	199	53	138	30	196	271	164
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	9
Total Lost time (s)	5.0	4.0		5.0	4.1		4.0	4.8	4.8	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95	1.00	0.97	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3467	3448		1805	3358		1805	3610	1505	3303	1900	1408
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3467	3448		1805	3358		1805	3610	1505	3303	1900	1408
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	233	503	182	170	613	216	58	150	33	213	295	178
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	15	0	0	58
Lane Group Flow (vph)	233	685	0	170	829	0	58	150	18	213	295	120
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			5			5			5			5
Heavy Vehicles (%)	1%	0%	0%	0%	2%	5%	0%	0%	5%	6%	0%	1%
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)	17.0	48.2		17.0	48.1		10.4	36.0	36.0	11.0	37.4	37.4
Effective Green, g (s)	17.0	48.2		17.0	48.1		10.4	36.0	36.0	11.0	37.4	37.4
Actuated g/C Ratio	0.13	0.37		0.13	0.37		0.08	0.28	0.28	0.08	0.29	0.29
Clearance Time (s)	5.0	4.0		5.0	4.1		4.0	4.8	4.8	4.0	4.0	4.0
Vehicle Extension (s)	2.5	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	453	1278		236	1242		144	999	416	279	546	405
v/s Ratio Prot	0.07	0.20		c0.09	c0.25		0.03	0.04		c0.06	c0.16	
v/s Ratio Perm									0.01			0.09
v/c Ratio	0.51	0.54		0.72	0.67		0.40	0.15	0.04	0.76	0.54	0.30
Uniform Delay, d1	52.7	32.1		54.2	34.3		56.8	35.5	34.4	58.2	39.0	36.1
Progression Factor	1.00	1.00		1.13	0.87		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	1.6		7.8	2.5		0.7	0.3	0.2	10.6	3.8	1.9
Delay (s)	53.4	33.7		69.1	32.3		57.5	35.8	34.6	68.8	42.9	37.9
Level of Service	D	C		E	C		E	D	C	E	D	D
Approach Delay (s)		38.7			38.5			40.8			49.6	
Approach LOS		D			D			D			D	

Intersection Summary				
HCM 2000 Control Delay	41.5	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.65			
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	17.9	
Intersection Capacity Utilization	103.4%	ICU Level of Service	G	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
16: Reichert Ave & De Long Ave

11/22/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	68	634	11	61	927	201	12	21	38	188	35	75
Future Volume (vph)	68	634	11	61	927	201	12	21	38	188	35	75
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.1		3.0	4.1		3.5	3.5	3.5	3.5	3.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00	0.98	1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00	1.00	0.99	1.00	
Frt	1.00	1.00		1.00	0.97		1.00	1.00	0.85	1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1805	3529		1805	3460		1793	1900	1578	1778	1676	
Flt Permitted	0.95	1.00		0.95	1.00		0.56	1.00	1.00	0.74	1.00	
Satd. Flow (perm)	1805	3529		1805	3460		1063	1900	1578	1389	1676	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	76	704	12	68	1030	223	13	23	42	209	39	83
RTOR Reduction (vph)	0	0	0	0	6	0	0	0	9	0	28	0
Lane Group Flow (vph)	76	716	0	68	1247	0	13	23	33	209	94	0
Confl. Peds. (#/hr)			6			3	6		4	4		6
Confl. Bikes (#/hr)			5			5			5			5
Heavy Vehicles (%)	0%	2%	0%	0%	1%	1%	0%	0%	0%	1%	0%	0%
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	8.9	86.4		8.5	86.0		24.5	24.5	24.5	24.5	24.5	
Effective Green, g (s)	8.9	86.4		8.5	86.0		24.5	24.5	24.5	24.5	24.5	
Actuated g/C Ratio	0.07	0.66		0.07	0.66		0.19	0.19	0.19	0.19	0.19	
Clearance Time (s)	3.0	4.1		3.0	4.1		3.5	3.5	3.5	3.5	3.5	
Vehicle Extension (s)	2.0	3.0		2.0	3.0		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	123	2345		118	2288		200	358	297	261	315	
v/s Ratio Prot	c0.04	0.20		0.04	c0.36			0.01			0.06	
v/s Ratio Perm							0.01		0.02	c0.15		
v/c Ratio	0.62	0.31		0.58	0.54		0.07	0.06	0.11	0.80	0.30	
Uniform Delay, d1	58.9	9.2		59.0	11.6		43.3	43.3	43.7	50.4	45.4	
Progression Factor	1.00	1.15		1.07	0.98		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	5.4	0.3		4.0	0.9		0.1	0.0	0.1	15.2	0.2	
Delay (s)	64.4	10.9		67.3	12.3		43.4	43.4	43.8	65.6	45.6	
Level of Service	E	B		E	B		D	D	D	E	D	
Approach Delay (s)		16.0			15.1			43.6			58.2	
Approach LOS		B			B			D			E	

Intersection Summary				
HCM 2000 Control Delay	21.9	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.60			
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	10.6	
Intersection Capacity Utilization	67.7%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
17: US 101 SB Ramps & De Long Ave

11/22/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	188	642	20	815	0	0	0	0	11	2	303
Future Volume (vph)	0	188	642	20	815	0	0	0	0	11	2	303
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.6	3.6	3.0	3.6					4.0	4.0	
Lane Util. Factor		0.95	1.00	1.00	0.95					0.95	0.95	
Frt		1.00	0.85	1.00	1.00					1.00	0.85	
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (prot)		3574	1599	1770	3539					1681	1506	
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (perm)		3574	1599	1770	3539					1681	1506	
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)	0	200	683	21	867	0	0	0	0	12	2	322
RTOR Reduction (vph)	0	0	264	0	0	0	0	0	0	0	120	0
Lane Group Flow (vph)	0	200	419	21	867	0	0	0	0	11	205	0
Heavy Vehicles (%)	0%	1%	1%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type		NA	Perm	Prot	NA					Split	NA	
Protected Phases		6		5	2					4	4	
Permitted Phases			6									
Actuated Green, G (s)		39.9	39.9	1.4	44.3					13.1	13.1	
Effective Green, g (s)		39.9	39.9	1.4	44.3					13.1	13.1	
Actuated g/C Ratio		0.61	0.61	0.02	0.68					0.20	0.20	
Clearance Time (s)		3.6	3.6	3.0	3.6					4.0	4.0	
Vehicle Extension (s)		4.0	4.0	2.0	4.0					2.5	2.5	
Lane Grp Cap (vph)		2193	981	38	2411					338	303	
v/s Ratio Prot		0.06		c0.01	0.24					0.01	c0.14	
v/s Ratio Perm			c0.26									
v/c Ratio		0.09	0.43	0.55	0.36					0.03	0.68	
Uniform Delay, d1		5.1	6.6	31.5	4.4					20.9	24.0	
Progression Factor		1.03	5.87	1.00	1.00					1.00	1.00	
Incremental Delay, d2		0.1	1.3	9.5	0.4					0.0	5.4	
Delay (s)		5.3	39.9	41.0	4.8					20.9	29.4	
Level of Service		A	D	D	A					C	C	
Approach Delay (s)		32.1			5.6			0.0			29.1	
Approach LOS		C			A			A			C	

Intersection Summary				
HCM 2000 Control Delay	20.5	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.49			
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	10.6	
Intersection Capacity Utilization	62.8%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
18: US 101 NB Ramps & De Long Ave

11/22/2017

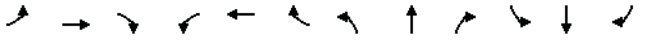
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	166	33	0	1	58	9	778	2	17	0	0	0
Future Volume (vph)	166	33	0	1	58	9	778	2	17	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.6			3.6		4.5	4.5				
Lane Util. Factor	1.00	0.95			0.95		0.95	0.95				
Frt	1.00	1.00			0.98		1.00	0.99				
Flt Protected	0.95	1.00			1.00		0.95	0.95				
Satd. Flow (prot)	1770	3610			3483		1698	1690				
Flt Permitted	0.95	1.00			0.95		0.95	0.95				
Satd. Flow (perm)	1770	3610			3316		1698	1690				
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	189	38	0	1	66	10	884	2	19	0	0	0
RTOR Reduction (vph)	0	0	0	0	9	0	0	2	0	0	0	0
Lane Group Flow (vph)	189	38	0	0	68	0	451	452	0	0	0	0
Heavy Vehicles (%)	2%	0%	0%	0%	0%	12%	1%	0%	8%	0%	0%	0%
Turn Type	Prot	NA			NA		Split	NA				
Protected Phases	1	6			2		4	4				
Permitted Phases												
Actuated Green, G (s)	8.8	16.9			4.6		20.6	20.6				
Effective Green, g (s)	8.8	16.9			4.6		20.6	20.6				
Actuated g/C Ratio	0.19	0.37			0.10		0.45	0.45				
Clearance Time (s)	3.5	3.6			3.6		4.5	4.5				
Vehicle Extension (s)	2.5	2.0			2.0		3.0	3.0				
Lane Grp Cap (vph)	341	1337			334		767	763				
v/s Ratio Prot	c0.11	0.01					0.27	c0.27				
v/s Ratio Perm					c0.02							
v/c Ratio	0.55	0.03			1.00dr		0.59	0.59				
Uniform Delay, d1	16.6	9.1			18.8		9.3	9.4				
Progression Factor	1.00	1.00			1.00		1.00	1.00				
Incremental Delay, d2	1.6	0.0			0.1		1.2	1.2				
Delay (s)	18.2	9.1			18.9		10.5	10.6				
Level of Service	B	A			B		B	B				
Approach Delay (s)		16.7			18.9			10.5			0.0	
Approach LOS		B			B			B			A	

Intersection Summary				
HCM 2000 Control Delay	12.2	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.53			
Actuated Cycle Length (s)	45.6	Sum of lost time (s)	11.6	
Intersection Capacity Utilization	45.1%	ICU Level of Service	A	
Analysis Period (min)	15			

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
19: Redwood Blvd & Lamont Ave 11/22/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	2	8	100	2	50	16	263	41	65	490	28
Future Volume (vph)	10	2	8	100	2	50	16	263	41	65	490	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	3.5		3.5	3.5	3.5	4.8		3.5	4.8	4.8
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes		1.00	1.00		1.00	0.99	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85		1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected		0.96	1.00		0.95	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1822	1615		1811	1595	1805	3527		1805	3610	1615
Flt Permitted		0.84	1.00		0.74	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1599	1615		1405	1595	1805	3527		1805	3610	1615
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	11	2	9	110	2	55	18	289	45	71	538	31
RTOR Reduction (vph)	0	0	7	0	0	40	0	12	0	0	0	17
Lane Group Flow (vph)	0	13	2	0	112	15	18	322	0	71	538	14
Confl. Peds. (#/hr)	1					1			2			
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8		8	4		4						2
Actuated Green, G (s)		12.7	12.7		12.7	12.7	0.9	18.9		3.1	21.1	21.1
Effective Green, g (s)		12.7	12.7		12.7	12.7	0.9	18.9		3.1	21.1	21.1
Actuated g/C Ratio		0.27	0.27		0.27	0.27	0.02	0.41		0.07	0.45	0.45
Clearance Time (s)		3.5	3.5		3.5	3.5	3.5	4.8		3.5	4.8	4.8
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0	3.0		2.0	3.0	3.0
Lane Grp Cap (vph)		436	441		383	435	34	1433		120	1638	732
v/s Ratio Prot							0.01	0.09		c0.04	c0.15	
v/s Ratio Perm		0.01	0.00		c0.08	0.01						0.01
v/c Ratio		0.03	0.01		0.29	0.03	0.53	0.22		0.59	0.33	0.02
Uniform Delay, d1		12.4	12.3		13.4	12.4	22.6	9.0		21.1	8.2	7.0
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		0.0	0.0		0.2	0.0	6.7	0.1		5.1	0.1	0.0
Delay (s)		12.4	12.3		13.5	12.4	29.3	9.1		26.2	8.3	7.0
Level of Service		B	B		B	B	C	A		C	A	A
Approach Delay (s)		12.4			13.1			10.1			10.2	
Approach LOS		B			B			B			B	

Intersection Summary				
HCM 2000 Control Delay	10.6	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.34			
Actuated Cycle Length (s)	46.5	Sum of lost time (s)	11.8	
Intersection Capacity Utilization	44.7%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
20: Redwood Blvd & Landing Ct 11/22/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	0	1	25	0	12	1	306	32	25	479	1
Future Volume (vph)	2	0	1	25	0	12	1	306	32	25	479	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5		3.5		3.5		4.8	4.8	3.5	4.8	4.8
Lane Util. Factor		1.00		1.00		1.00		0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes		1.00		1.00		1.00		1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes		1.00		1.00		1.00		1.00	1.00	1.00	1.00	1.00
Frt		0.95		1.00		0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected		0.97		0.95		1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1748		1803		1615		3609	1579	1805	3610	1572
Flt Permitted		0.97		1.00		1.00		0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1748		1898		1615		3444	1579	1805	3610	1572
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2	0	1	27	0	13	1	333	35	27	521	1
RTOR Reduction (vph)	0	3	0	0	0	12	0	0	13	0	0	0
Lane Group Flow (vph)	0	0	0	27	0	1	0	334	22	27	521	1
Confl. Peds. (#/hr)			4	4					3			6
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA		Perm		Perm	Perm	NA	Perm	Prot	NA	Perm
Protected Phases		4						2		1	6	
Permitted Phases	4			8		8	2		2			6
Actuated Green, G (s)		4.0		4.0		4.0		26.9	26.9	0.8	31.2	31.2
Effective Green, g (s)		4.0		4.0		4.0		26.9	26.9	0.8	31.2	31.2
Actuated g/C Ratio		0.09		0.09		0.09		0.62	0.62	0.02	0.72	0.72
Clearance Time (s)		3.5		3.5		3.5		4.8	4.8	3.5	4.8	4.8
Vehicle Extension (s)		3.0		2.0		2.0		4.0	4.0	2.0	4.0	4.0
Lane Grp Cap (vph)		160		174		148		2129	976	33	2589	1127
v/s Ratio Prot										c0.01	c0.14	
v/s Ratio Perm		0.00		c0.01		0.00		0.10	0.01			0.00
v/c Ratio		0.00		0.16		0.01		0.16	0.02	0.82	0.20	0.00
Uniform Delay, d1		17.9		18.2		17.9		3.5	3.2	21.3	2.0	1.7
Progression Factor		1.00		1.00		1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.0		0.2		0.0		0.0	0.0	81.1	0.1	0.0
Delay (s)		17.9		18.3		18.0		3.6	3.2	102.4	2.1	1.7
Level of Service		B		B		B		A	A	F	A	A
Approach Delay (s)		17.9			18.2			3.5			7.0	
Approach LOS		B			B			A			A	

Intersection Summary				
HCM 2000 Control Delay	6.2	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.23			
Actuated Cycle Length (s)	43.5	Sum of lost time (s)	11.8	
Intersection Capacity Utilization	40.5%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
21: Novato Blvd & Center Rd/Garden Ct

11/22/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	0	295	3	0	3	121	454	4	1	662	66
Future Volume (vph)	56	0	295	3	0	3	121	454	4	1	662	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.2	3.2			3.0		3.0	4.4		3.0	4.4	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.85			0.93		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1615			1729		1805	3604		1805	3518	
Flt Permitted	0.75	1.00			0.58		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1432	1615			1035		1805	3604		1805	3518	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	61	0	321	3	0	3	132	493	4	1	720	72
RTOR Reduction (vph)	0	285	0	0	5	0	0	0	0	0	4	0
Lane Group Flow (vph)	61	36	0	0	1	0	132	497	0	1	788	0
Confl. Peds. (#/hr)									9			6
Confl. Bikes (#/hr)									2			
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4								
Actuated Green, G (s)	11.2	11.2			11.4		12.3	76.0		2.2	65.9	
Effective Green, g (s)	11.2	11.2			11.4		12.3	76.0		2.2	65.9	
Actuated g/C Ratio	0.11	0.11			0.11		0.12	0.76		0.02	0.66	
Clearance Time (s)	3.2	3.2			3.0		3.0	4.4		3.0	4.4	
Vehicle Extension (s)	3.0	3.0			2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	160	180			117		222	2739		39	2318	
v/s Ratio Prot		0.02					c0.07	0.14		0.00	c0.22	
v/s Ratio Perm	c0.04				0.00							
v/c Ratio	0.38	0.20			0.01		0.59	0.18		0.03	0.34	
Uniform Delay, d1	41.2	40.3			39.3		41.5	3.3		47.9	7.5	
Progression Factor	1.00	1.00			1.00		0.74	1.23		1.00	1.00	
Incremental Delay, d2	1.5	0.5			0.0		2.8	0.1		0.1	0.4	
Delay (s)	42.7	40.9			39.3		33.3	4.3		47.9	7.9	
Level of Service	D	D			D		C	A		D	A	
Approach Delay (s)		41.2			39.3			10.4			7.9	
Approach LOS		D			D			B			A	

Intersection Summary				
HCM 2000 Control Delay	15.9	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.38			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.6	
Intersection Capacity Utilization	57.4%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
22: Novato Blvd & Arthur St

11/22/2017

Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	157	124	220	490	18	823	180
Future Volume (vph)	157	124	220	490	18	823	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5	3.5	4.9	3.5	4.9	
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	0.95	
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	0.99	
Flpb, ped/bikes	0.99	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	1.00	0.97	
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1785	1579	1805	3610	1805	3465	
Flt Permitted	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (perm)	1785	1579	1805	3610	1805	3465	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	171	135	239	533	20	895	196
RTOR Reduction (vph)	0	114	0	0	0	13	0
Lane Group Flow (vph)	171	21	239	533	20	1078	0
Confl. Peds. (#/hr)	10	8					5
Confl. Bikes (#/hr)		1					
Heavy Vehicles (%)	0%	0%	0%	0%	0%	1%	0%
Turn Type	Perm	Perm	Prot	NA	Prot	NA	
Protected Phases			1	6	5	2	
Permitted Phases	4	4					
Actuated Green, G (s)	15.5	15.5	17.3	69.9	2.7	55.3	
Effective Green, g (s)	15.5	15.5	17.3	69.9	2.7	55.3	
Actuated g/C Ratio	0.16	0.16	0.17	0.70	0.03	0.55	
Clearance Time (s)	3.5	3.5	3.5	4.9	3.5	4.9	
Vehicle Extension (s)	2.0	2.0	2.0	4.0	2.0	4.0	
Lane Grp Cap (vph)	276	244	312	2523	48	1916	
v/s Ratio Prot			c0.13	0.15	0.01	c0.31	
v/s Ratio Perm	c0.10	0.01					
v/c Ratio	0.62	0.09	0.77	0.21	0.42	0.56	
Uniform Delay, d1	39.5	36.2	39.4	5.3	47.9	14.5	
Progression Factor	1.00	1.00	0.88	0.76	1.38	0.74	
Incremental Delay, d2	2.9	0.1	8.3	0.2	2.0	1.1	
Delay (s)	42.4	36.2	43.0	4.2	68.0	11.9	
Level of Service	D	D	D	A	E	B	
Approach Delay (s)	39.7			16.2		12.9	
Approach LOS	D			B		B	

Intersection Summary			
HCM 2000 Control Delay	17.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.9
Intersection Capacity Utilization	63.5%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
23: Novato Blvd & Rowland Blvd

11/22/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	135	15	353	308	336	43	294	216	367	413	179
Future Volume (vph)	44	135	15	353	308	336	43	294	216	367	413	179
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5		3.5	4.1	4.1	3.5	4.1		3.5	4.4	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		0.97	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.99	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	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.94		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1858		1770	1900	1576	1805	1744		3502	1793	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1805	1858		1770	1900	1576	1805	1744		3502	1793	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	46	142	16	372	324	354	45	309	227	386	435	188
RTOR Reduction (vph)	0	4	0	0	0	250	0	24	0	0	13	0
Lane Group Flow (vph)	46	154	0	372	324	104	45	512	0	386	610	0
Confl. Peds. (#/hr)			24			2			13			10
Confl. Bikes (#/hr)			1						1			
Heavy Vehicles (%)	0%	0%	0%	2%	0%	1%	0%	0%	2%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases						4						
Actuated Green, G (s)	5.6	18.1		17.5	29.4	29.4	5.7	35.7		14.1	43.8	
Effective Green, g (s)	5.6	18.1		17.5	29.4	29.4	5.7	35.7		14.1	43.8	
Actuated g/C Ratio	0.06	0.18		0.18	0.29	0.29	0.06	0.36		0.14	0.44	
Clearance Time (s)	3.5	3.5		3.5	4.1	4.1	3.5	4.1		3.5	4.4	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	3.0		2.0	2.0	
Lane Grp Cap (vph)	101	336		309	558	463	102	622		493	785	
v/s Ratio Prot	0.03	0.08		c0.21	c0.17		0.02	c0.29		0.11	c0.34	
v/s Ratio Perm						0.07						
v/c Ratio	0.46	0.46		1.20	0.58	0.22	0.44	0.82		0.78	0.78	
Uniform Delay, d1	45.7	36.6		41.2	30.1	26.7	45.6	29.3		41.5	23.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.19	0.64	
Incremental Delay, d2	1.2	0.4		118.4	1.0	0.1	1.1	11.8		6.4	6.5	
Delay (s)	46.9	36.9		159.7	31.0	26.8	46.7	41.0		55.8	21.7	
Level of Service	D	D		F	C	C	D	D		E	C	
Approach Delay (s)		39.2			75.2			41.5			34.7	
Approach LOS		D			E			D			C	

Intersection Summary				
HCM 2000 Control Delay	51.4	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.87			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.5	
Intersection Capacity Utilization	88.0%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
24: Redwood Blvd & Rowland Blvd

11/22/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	112	654	47	20	782	268	69	22	77	285	18	294
Future Volume (vph)	112	654	47	20	782	268	69	22	77	285	18	294
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.4	4.4	3.5	3.7	3.7	3.5	4.1		3.5	4.8	4.8
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.99	1.00	0.99		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		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1805	3574	1589	1805	3574	1578	1805	3151		3502	1900	1593
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1805	3574	1589	1805	3574	1578	1805	3151		3502	1900	1593
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	126	735	53	22	879	301	78	25	87	320	20	330
RTOR Reduction (vph)	0	0	27	0	0	73	0	75	0	0	0	244
Lane Group Flow (vph)	126	735	26	22	879	228	78	37	0	320	20	86
Confl. Peds. (#/hr)			6			2			3			2
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	0%	1%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						4
Actuated Green, G (s)	11.1	38.9	38.9	3.0	31.5	31.5	8.0	10.7		12.5	14.5	14.5
Effective Green, g (s)	11.1	38.9	38.9	3.0	31.5	31.5	8.0	10.7		12.5	14.5	14.5
Actuated g/C Ratio	0.14	0.48	0.48	0.04	0.39	0.39	0.10	0.13		0.16	0.18	0.18
Clearance Time (s)	3.5	4.4	4.4	3.5	3.7	3.7	3.5	4.1		3.5	4.8	4.8
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	2.0	2.5		2.5	2.5	2.5
Lane Grp Cap (vph)	248	1724	766	67	1396	616	179	418		543	341	286
v/s Ratio Prot	c0.07	0.21		0.01	c0.25		0.04	0.01		c0.09	0.01	
v/s Ratio Perm			0.02			0.14						c0.05
v/c Ratio	0.51	0.43	0.03	0.33	0.63	0.37	0.44	0.09		0.59	0.06	0.30
Uniform Delay, d1	32.2	13.6	11.0	37.8	19.8	17.5	34.2	30.7		31.7	27.4	28.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.6	0.2	0.0	1.0	1.0	0.5	0.6	0.1		1.4	0.1	0.4
Delay (s)	32.8	13.8	11.0	38.9	20.9	18.0	34.8	30.7		33.0	27.4	29.1
Level of Service	C	B	B	D	C	B	C	C		C	C	C
Approach Delay (s)		16.3			20.5			32.4			30.9	
Approach LOS		B			C			C			C	

Intersection Summary				
HCM 2000 Control Delay	22.3	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.57			
Actuated Cycle Length (s)	80.6	Sum of lost time (s)	16.2	
Intersection Capacity Utilization	60.2%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
25: US 101 SB Ramps & Rowland Blvd

11/22/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	563	427	132	630	0	0	0	0	269	47	480
Future Volume (vph)	0	563	427	132	630	0	0	0	0	269	47	480
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.6	3.6	3.0	3.6					3.0	3.0	
Lane Util. Factor		0.91	0.91	0.97	0.95					0.91	0.91	
Frpb, ped/bikes		1.00	0.99	1.00	1.00					1.00	0.99	
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	
Frt		0.97	0.85	1.00	1.00					1.00	0.87	
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (prot)		3329	1450	3367	3574					1643	2845	
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (perm)		3329	1450	3367	3574					1643	2845	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	612	464	143	685	0	0	0	0	292	51	522
RTOR Reduction (vph)	0	22	203	0	0	0	0	0	0	0	79	0
Lane Group Flow (vph)	0	725	126	143	685	0	0	0	0	263	523	0
Confl. Peds. (#/hr)			2									2
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	0%	1%	0%	4%	1%	0%	0%	0%	0%	0%	40%	1%
Turn Type		NA	Perm	Prot	NA					Split	NA	
Protected Phases		2		1	6					4	4	
Permitted Phases			2									
Actuated Green, G (s)		17.7	17.7	3.7	24.4					15.2	15.2	
Effective Green, g (s)		17.7	17.7	3.7	24.4					15.2	15.2	
Actuated g/C Ratio		0.38	0.38	0.08	0.53					0.33	0.33	
Clearance Time (s)		3.6	3.6	3.0	3.6					3.0	3.0	
Vehicle Extension (s)		4.0	4.0	2.0	2.5					2.0	2.0	
Lane Grp Cap (vph)		1275	555	269	1887					540	936	
v/s Ratio Prot		c0.22		c0.04	0.19					0.16	c0.18	
v/s Ratio Perm			0.09									
v/c Ratio		0.57	0.23	0.53	0.36					0.49	0.92dr	
Uniform Delay, d1		11.2	9.6	20.4	6.4					12.4	12.7	
Progression Factor		1.00	1.00	1.00	1.00					1.00	1.00	
Incremental Delay, d2		0.7	0.3	1.0	0.1					0.3	0.4	
Delay (s)		11.9	9.9	21.4	6.5					12.6	13.2	
Level of Service		B	A	C	A					B	B	
Approach Delay (s)		11.3			9.0			0.0			13.0	
Approach LOS		B			A			A			B	

Intersection Summary				
HCM 2000 Control Delay	11.2	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.56			
Actuated Cycle Length (s)	46.2	Sum of lost time (s)	9.6	
Intersection Capacity Utilization	51.3%	ICU Level of Service	A	
Analysis Period (min)	15			

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
26: US 101 NB Ramps & Rowland Blvd

11/22/2017

Movement	EBL2	EBL	EBT	WBT	WBR	WBR2	NBL2	NBL	NBT	NBR	NEL2	NEL
Lane Configurations												
Traffic Volume (vph)	26	237	596	305	1	142	466	7	8	418	12	3
Future Volume (vph)	26	237	596	305	1	142	466	7	8	418	12	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.6	3.6		3.6	3.5		3.5	3.0		3.5
Lane Util. Factor		1.00	0.95	0.86		0.86	0.95		0.95	0.88		1.00
Frpb, ped/bikes		1.00	1.00	1.00		1.00	1.00		1.00	1.00		1.00
Flpb, ped/bikes		1.00	1.00	1.00		1.00	1.00		1.00	1.00		1.00
Frt		1.00	1.00	0.98		0.85	1.00		1.00	0.85		0.99
Flt Protected		0.95	1.00	1.00		1.00	0.95		0.95	1.00		0.96
Satd. Flow (prot)		1805	3574	4623		1323	1715		1683	2787		1800
Flt Permitted		0.95	1.00	1.00		1.00	0.95		0.95	1.00		0.96
Satd. Flow (perm)		1805	3574	4623		1323	1715		1683	2787		1800
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	28	258	648	332	1	154	507	8	9	454	13	3
RTOR Reduction (vph)	0	0	0	14	0	84	0	0	0	0	0	0
Lane Group Flow (vph)	0	286	648	364	0	25	264	0	260	454	0	17
Confl. Peds. (#/hr)										2		
Heavy Vehicles (%)	0%	0%	1%	4%	0%	5%	0%	0%	67%	2%	0%	0%
Turn Type	Prot	Prot	NA	NA		Perm	Split	Split	NA	custom	Perm	Prot
Protected Phases	5	5	2	6			8	8	8	1 8		7
Permitted Phases						6					7	
Actuated Green, G (s)		16.0	17.5	13.9		13.9	16.4		16.4	32.3		1.3
Effective Green, g (s)		16.0	17.5	13.9		13.9	16.4		16.4	28.8		1.3
Actuated g/C Ratio		0.26	0.29	0.23		0.23	0.27		0.27	0.47		0.02
Clearance Time (s)		3.0	3.6	3.6		3.6	3.5		3.5			3.5
Vehicle Extension (s)		2.0	2.0	2.0		2.0	2.0		2.0			2.0
Lane Grp Cap (vph)		471	1021	1049		300	459		451	1311		38
v/s Ratio Prot		0.16	c0.18	c0.08			0.15		c0.15	0.16		
v/s Ratio Perm						0.02						0.01
v/c Ratio		0.61	0.63	0.35		0.08	0.58		0.58	0.35		0.45
Uniform Delay, d1		19.8	19.1	19.8		18.6	19.4		19.4	10.2		29.6
Progression Factor		1.00	1.00	1.00		1.00	1.00		1.00	1.00		1.00
Incremental Delay, d2		1.5	1.0	0.1		0.0	1.1		1.1	0.1		3.0
Delay (s)		21.4	20.0	19.9		18.7	20.5		20.5	10.3		32.6
Level of Service		C	C	B		B	C		C	B		C
Approach Delay (s)			20.4	19.6					15.8			32.6
Approach LOS			C	B					B			C

Intersection Summary				
HCM 2000 Control Delay	18.5	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.54			
Actuated Cycle Length (s)	61.2	Sum of lost time (s)	13.6	
Intersection Capacity Utilization	61.4%	ICU Level of Service	B	
Analysis Period (min)	15			

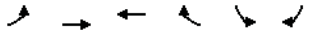
c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
26: US 101 NB Ramps & Rowland Blvd 11/22/2017

Movement	NER
Lane Configurations	
Traffic Volume (vph)	1
Future Volume (vph)	1
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	1
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	0%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM Signalized Intersection Capacity Analysis
27: Rowland Blvd & Rowland Way 11/22/2017



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	401	608	356	22	12	82
Future Volume (vph)	401	608	356	22	12	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.6	3.2		3.2	3.2
Lane Util. Factor	0.97	0.91	0.95		1.00	0.95
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		0.89	0.85
Flt Protected	0.95	1.00	1.00		0.99	1.00
Satd. Flow (prot)	3467	5085	3398		1605	1490
Flt Permitted	0.95	1.00	1.00		0.99	1.00
Satd. Flow (perm)	3467	5085	3398		1605	1490
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	451	683	400	25	13	92
RTOR Reduction (vph)	0	0	5	0	34	45
Lane Group Flow (vph)	451	683	420	0	19	7
Confl. Peds. (#/hr)				1	2	
Heavy Vehicles (%)	1%	2%	5%	9%	6%	3%
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases						4
Actuated Green, G (s)	12.9	31.9	15.9		6.2	6.2
Effective Green, g (s)	12.9	31.9	15.9		6.2	6.2
Actuated g/C Ratio	0.29	0.71	0.35		0.14	0.14
Clearance Time (s)	3.5	3.6	3.2		3.2	3.2
Vehicle Extension (s)	2.0	4.0	4.0		2.0	2.0
Lane Grp Cap (vph)	996	3612	1203		221	205
v/s Ratio Prot	c0.13	0.13	c0.12		c0.01	
v/s Ratio Perm						0.00
v/c Ratio	0.45	0.19	0.35		0.08	0.04
Uniform Delay, d1	13.1	2.2	10.7		16.9	16.8
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.1	0.0	0.2		0.1	0.0
Delay (s)	13.2	2.2	10.9		16.9	16.8
Level of Service	B	A	B		B	B
Approach Delay (s)		6.6	10.9		16.9	
Approach LOS		A	B		B	

Intersection Summary				
HCM 2000 Control Delay	8.3	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.34			
Actuated Cycle Length (s)	44.9	Sum of lost time (s)	9.9	
Intersection Capacity Utilization	37.5%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
28: Vintage Way & Rowland Blvd 11/22/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	318	299	2	232	3	129	3	0	1	2	1
Future Volume (vph)	7	318	299	2	232	3	129	3	0	1	2	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.6	3.6	3.0	3.6		3.6	3.6			3.2	
Lane Util. Factor	1.00	0.95	0.88	1.00	0.95		0.97	1.00			1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00			0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1805	3195	2814	1805	3249		3367	1900			1813	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00			0.99	
Satd. Flow (perm)	1805	3195	2814	1805	3249		3367	1900			1813	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	8	374	352	2	273	4	152	4	0	1	2	1
RTOR Reduction (vph)	0	0	0	0	2	0	0	0	0	0	1	0
Lane Group Flow (vph)	8	374	352	2	275	0	152	4	0	0	3	0
Confl. Peds. (#/hr)			1			3			1			
Confl. Bikes (#/hr)			2			2						
Heavy Vehicles (%)	0%	13%	1%	0%	11%	0%	4%	0%	0%	0%	0%	0%
Turn Type	Prot	NA	pt+ov	Prot	NA		Split	NA		Split	NA	
Protected Phases	5	2	2 3	1	6		3	3		4	4	
Permitted Phases												
Actuated Green, G (s)	1.1	11.0	31.1	0.5	10.4		16.5	16.5			1.1	
Effective Green, g (s)	1.1	11.0	31.1	0.5	10.4		16.5	16.5			1.1	
Actuated g/C Ratio	0.03	0.26	0.73	0.01	0.24		0.39	0.39			0.03	
Clearance Time (s)	3.0	3.6		3.0	3.6		3.6	3.6			3.2	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		3.0	3.0			2.0	
Lane Grp Cap (vph)	46	826	2059	21	795		1307	737			46	
v/s Ratio Prot	c0.00	c0.12	c0.13	0.00	0.08		0.05	0.00			c0.00	
v/s Ratio Perm												
v/c Ratio	0.17	0.45	0.17	0.10	0.35		0.12	0.01			0.07	
Uniform Delay, d1	20.3	13.2	1.7	20.8	13.2		8.3	8.0			20.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.7	0.1	0.0	0.7	0.1		0.0	0.0			0.2	
Delay (s)	20.9	13.4	1.8	21.5	13.3		8.4	8.0			20.4	
Level of Service	C	B	A	C	B		A	A			C	
Approach Delay (s)		7.9			13.4			8.4			20.4	
Approach LOS		A			B			A			C	

Intersection Summary				
HCM 2000 Control Delay	9.3	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.29			
Actuated Cycle Length (s)	42.5	Sum of lost time (s)	13.4	
Intersection Capacity Utilization	36.0%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
29: Novato Blvd & Sunset Pkwy 11/22/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	239	65	25	37	97	96	24	242	53	51	329	310
Future Volume (vph)	239	65	25	37	97	96	24	242	53	51	329	310
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.0		3.5	3.5		3.5	4.9		3.5	4.6	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	0.97		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	0.96		1.00	0.93		1.00	0.97		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	1808		1805	1712		1805	1841		1770	1713	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1787	1808		1805	1712		1805	1841		1770	1713	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	263	71	27	41	107	105	26	266	58	56	362	341
RTOR Reduction (vph)	0	14	0	0	39	0	0	7	0	0	30	0
Lane Group Flow (vph)	263	84	0	41	173	0	26	317	0	56	673	0
Confl. Peds. (#/hr)			4			21			3			5
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	0%	0%	0%	2%	1%	2%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases												
Actuated Green, G (s)	12.8	22.8		5.7	16.2		3.4	32.5		5.8	35.2	
Effective Green, g (s)	12.8	22.8		5.7	16.2		3.4	32.5		5.8	35.2	
Actuated g/C Ratio	0.15	0.28		0.07	0.20		0.04	0.39		0.07	0.43	
Clearance Time (s)	3.5	4.0		3.5	3.5		3.5	4.9		3.5	4.6	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	276	498		124	335		74	723		124	729	
v/s Ratio Prot	c0.15	0.05		0.02	c0.10		0.01	0.17		c0.03	c0.39	
v/s Ratio Perm												
v/c Ratio	0.95	0.17		0.33	0.52		0.35	0.44		0.45	0.92	
Uniform Delay, d1	34.7	22.8		36.7	29.7		38.6	18.4		36.9	22.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	40.9	0.1		0.6	0.6		1.1	0.2		1.0	17.0	
Delay (s)	75.6	22.8		37.3	30.3		39.6	18.6		37.9	39.5	
Level of Service	E	C		D	C		D	B		D	D	
Approach Delay (s)		61.3			31.4			20.1			39.4	
Approach LOS		E			C			C			D	

Intersection Summary				
HCM 2000 Control Delay	38.9	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.82			
Actuated Cycle Length (s)	82.7	Sum of lost time (s)	15.9	
Intersection Capacity Utilization	83.4%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Intersection	
Intersection Delay, s/veh	229.2
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	47	467	382	324	172	27	90	6	70	94	21	64
Future Vol, veh/h	47	467	382	324	172	27	90	6	70	94	21	64
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Heavy Vehicles, %	1	2	1	1	2	1	1	1	1	1	1	1
Mvmt Flow	51	502	411	348	185	29	97	6	75	101	23	69
Number of Lanes	1	1	0	1	1	0	1	1	1	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	3	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	2	2	2
HCM Control Delay	424.9	33.8	16.7	17.1
HCM LOS	F	D	C	C

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	100%	0%	0%	55%	0%	86%	0%	25%
Vol Right, %	0%	0%	100%	0%	45%	0%	14%	0%	75%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	90	6	70	47	849	324	199	94	85
LT Vol	90	0	0	47	0	324	0	94	0
Through Vol	0	6	0	0	467	0	172	0	21
RT Vol	0	0	70	0	382	0	27	0	64
Lane Flow Rate	97	6	75	51	913	348	214	101	91
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.257	0.016	0.175	0.119	1.938	0.801	0.458	0.265	0.214
Departure Headway (Hd)	11.496	10.967	10.228	8.458	7.643	9.906	9.307	11.411	10.321
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	315	328	353	427	484	369	389	317	350
Service Time	9.196	8.667	7.928	6.158	5.343	7.606	7.007	9.111	8.021
HCM Lane V/C Ratio	0.308	0.018	0.212	0.119	1.886	0.943	0.55	0.319	0.26
HCM Control Delay	18.1	13.8	15.1	12.3	447.7	42.5	19.6	18.2	15.8
HCM Lane LOS	C	B	C	B	F	E	C	C	C
HCM 95th-tile Q	1	0	0.6	0.4	60.9	6.9	2.3	1	0.8

MOVEMENT SUMMARY

Site: 30 [AM Existing + Project Alt]

Novato Boulevard/Redwood Boulevard
AM Existing + Project Alternative

Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NB Redwood Boulevard											
3	L2	97	2.0	0.260	8.4	LOS A	1.1	28.2	0.64	0.64	31.9
8	T1	6	2.0	0.260	8.4	LOS A	1.1	28.2	0.64	0.64	31.9
18	R2	75	2.0	0.260	8.4	LOS A	1.1	28.2	0.64	0.64	31.1
Approach		178	2.0	0.260	8.4	LOS A	1.1	28.2	0.64	0.64	31.5
East: WB Novato Blvd											
1	L2	348	2.0	0.488	8.5	LOS A	3.3	84.1	0.47	0.31	31.7
6	T1	185	2.0	0.488	8.5	LOS A	3.3	84.1	0.47	0.31	31.7
16	R2	29	2.0	0.488	8.5	LOS A	3.3	84.1	0.47	0.31	30.9
Approach		562	2.0	0.488	8.5	LOS A	3.3	84.1	0.47	0.31	31.6
North: SB Redwood Boulevard											
7	L2	101	2.0	0.274	8.4	LOS A	1.2	30.1	0.64	0.64	31.9
4	T1	23	2.0	0.274	8.4	LOS A	1.2	30.1	0.64	0.64	31.9
14	R2	69	2.0	0.274	8.4	LOS A	1.2	30.1	0.64	0.64	31.1
Approach		192	2.0	0.274	8.4	LOS A	1.2	30.1	0.64	0.64	31.6
West: EB Novato Blvd											
5	L2	51	2.0	0.668	16.0	LOS B	4.8	121.2	0.74	0.83	29.7
2	T1	502	2.0	0.668	16.0	LOS B	4.8	121.2	0.74	0.83	29.7
12	R2	411	2.0	0.457	9.6	LOS A	2.5	63.3	0.64	0.64	31.5
Approach		963	2.0	0.668	13.3	LOS B	4.8	121.2	0.70	0.75	30.5
All Vehicles		1897	2.0	0.668	10.9	LOS B	4.8	121.2	0.62	0.60	31.0

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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LANE SUMMARY

Site: 30 [AM Existing + Project Alt]

Novato Boulevard/Redwood Boulevard
AM Existing + Project Alternative

Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: NB Redwood Boulevard													
Lane 1[d]	178	2.0	685	0.260	100	8.4	LOS A	1.1	28.2	Full	1600	0.0	0.0
Approach	178	2.0		0.260		8.4	LOS A	1.1	28.2				
East: WB Novato Blvd													
Lane 1[d]	562	2.0	1153	0.488	100	8.5	LOS A	3.3	84.1	Full	1600	0.0	0.0
Approach	562	2.0		0.488		8.5	LOS A	3.3	84.1				
North: SB Redwood Boulevard													
Lane 1[d]	192	2.0	702	0.274	100	8.4	LOS A	1.2	30.1	Full	1600	0.0	0.0
Approach	192	2.0		0.274		8.4	LOS A	1.2	30.1				
West: EB Novato Blvd													
Lane 1[d]	553	2.0	828[1]	0.668	100	16.0	LOS B	4.8	121.2	Full	1600	0.0	0.0
Lane 2	411	2.0	898	0.457	100	9.6	LOS A	2.5	63.3	Short	30	0.0	NA
Approach	963	2.0		0.668		13.3	LOS B	4.8	121.2				
Intersection	1897	2.0		0.668		10.9	LOS B	4.8	121.2				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.
d Dominant lane on roundabout approach

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	47	467	382	324	172	27	90	6	70	94	21	64
Future Volume (vph)	47	467	382	324	172	27	90	6	70	94	21	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	16	12	16	16	12	12	12	12	12	12
Total Lost time (s)	3.5	4.0		3.5	4.0		3.5	4.0	4.0	3.5	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.93		1.00	0.98		1.00	1.00	0.85	1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1787	1977		1787	2071		1787	1881	1599	1787	1670	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1787	1977		1787	2071		1787	1881	1599	1787	1670	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	51	502	411	348	185	29	97	6	75	101	23	69
RTOR Reduction (vph)	0	20	0	0	4	0	0	0	69	0	63	0
Lane Group Flow (vph)	51	893	0	348	210	0	97	6	6	101	29	0
Heavy Vehicles (%)	1%	2%	1%	1%	2%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	6.8	56.0		25.9	75.1		8.3	8.8	8.8	10.3	10.8	
Effective Green, g (s)	6.8	56.0		25.9	75.1		8.3	8.8	8.8	10.3	10.8	
Actuated g/C Ratio	0.06	0.48		0.22	0.65		0.07	0.08	0.08	0.09	0.09	
Clearance Time (s)	3.5	4.0		3.5	4.0		3.5	4.0	4.0	3.5	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	104	954		398	1340		127	142	121	158	155	
v/s Ratio Prot	0.03	c0.45		c0.19	0.10		c0.05	0.00		0.06	c0.02	
v/s Ratio Perm									0.00			
v/c Ratio	0.49	0.94		0.87	0.16		0.76	0.04	0.05	0.64	0.19	
Uniform Delay, d1	52.9	28.3		43.5	8.0		52.9	49.7	49.7	51.1	48.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.6	15.8		18.7	0.1		23.4	0.1	0.2	8.2	0.6	
Delay (s)	56.5	44.1		62.2	8.1		76.3	49.8	49.9	59.3	49.2	
Level of Service	E	D		E	A		E	D	D	E	D	
Approach Delay (s)		44.8			41.6			64.3			54.5	
Approach LOS		D			D			E			D	

Intersection Summary			
HCM 2000 Control Delay	46.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.82		
Actuated Cycle Length (s)	116.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	87.7%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
31: Alameda Del Prado & Ignacio Blvd

02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	864	448	255	356	18	67	4	230	7	2	0
Future Volume (vph)	12	864	448	255	356	18	67	4	230	7	2	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.6	3.6	3.0	3.6			3.5	3.5		3.7	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00			1.00	0.98		1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00			0.99	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	0.99			1.00	0.85		1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00		0.96	
Satd. Flow (prot)	1770	3610	1573	1900	3584			1786	1589		1824	
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.73	1.00		0.85	
Satd. Flow (perm)	1770	3610	1573	1805	3584			1371	1589		1609	
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)	12	900	467	266	371	19	70	4	240	7	2	0
RTOR Reduction (vph)	0	0	87	0	2	0	0	0	208	0	0	0
Lane Group Flow (vph)	13	900	380	266	388	0	0	74	32	0	9	0
Confl. Peds. (#/hr)			4				7		4	4		7
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2				8		8	4		
Actuated Green, G (s)	1.3	49.3	49.3	27.4	75.4			13.2	13.2		13.0	
Effective Green, g (s)	1.3	49.3	49.3	27.4	75.4			13.2	13.2		13.0	
Actuated g/C Ratio	0.01	0.49	0.49	0.27	0.75			0.13	0.13		0.13	
Clearance Time (s)	3.0	3.6	3.6	3.0	3.6			3.5	3.5		3.7	
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0			2.0	2.0		2.0	
Lane Grp Cap (vph)	23	1779	775	520	2702			180	209		209	
v/s Ratio Prot	0.01	c0.25		c0.14	0.11							
v/s Ratio Perm			0.24					c0.05	0.02		0.01	
v/c Ratio	0.57	0.51	0.49	0.51	0.14			0.41	0.15		0.04	
Uniform Delay, d1	49.1	17.1	17.0	30.6	3.4			39.8	38.4		38.1	
Progression Factor	1.00	1.00	1.00	0.59	0.46			1.00	1.00		1.00	
Incremental Delay, d2	17.6	1.0	2.2	0.3	0.1			0.6	0.1		0.0	
Delay (s)	66.6	18.2	19.2	18.3	1.7			40.4	38.6		38.1	
Level of Service	E	B	B	B	A			D	D		D	
Approach Delay (s)		19.0			8.4			39.0			38.1	
Approach LOS		B			A			D			D	

Intersection Summary				
HCM 2000 Control Delay	18.8	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.49			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.3	
Intersection Capacity Utilization	62.9%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
32: US 101 SB Off Ramp/Enfrente Rd & Ignacio Blvd

02/15/2018

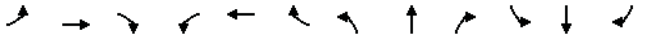
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	831	307	186	426	41	0	0	938	264	137	211
Future Volume (vph)	34	831	307	186	426	41	0	0	938	264	137	211
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			2%			0%	
Total Lost time (s)	3.0	8.0	8.0	4.0	5.0				4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95				0.88		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.96	1.00	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	1.00	0.85	1.00	0.99				0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00				1.00		0.97	1.00
Satd. Flow (prot)	1805	3610	1550	1787	3545				2814		1809	1578
Flt Permitted	0.95	1.00	1.00	0.95	1.00				1.00		0.97	1.00
Satd. Flow (perm)	1805	3610	1550	1787	3545				2814		1809	1578
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)	35	866	320	194	444	43	0	0	977	275	143	220
RTOR Reduction (vph)	0	0	135	0	6	0	0	0	325	0	0	158
Lane Group Flow (vph)	35	866	185	194	481	0	0	0	652	0	418	62
Confl. Peds. (#/hr)			7			20						1
Confl. Bikes (#/hr)						3						
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	5%	1%
Turn Type	Prot	NA	Perm	Prot	NA				Over	Split	NA	Perm
Protected Phases	5	2		1	6				1	7	7	
Permitted Phases			2									7
Actuated Green, G (s)	6.6	28.8	28.8	27.2	53.4				27.2		28.0	28.0
Effective Green, g (s)	6.6	28.8	28.8	27.2	53.4				27.2		28.0	28.0
Actuated g/C Ratio	0.07	0.29	0.29	0.27	0.53				0.27		0.28	0.28
Clearance Time (s)	3.0	8.0	8.0	4.0	5.0				4.0		4.0	4.0
Vehicle Extension (s)	2.0	2.5	2.5	3.0	4.0				3.0		2.5	2.5
Lane Grp Cap (vph)	119	1039	446	486	1893				765		506	441
v/s Ratio Prot	0.02	c0.24		0.11	0.14				c0.23		c0.23	
v/s Ratio Perm			0.12									0.04
v/c Ratio	0.29	0.83	0.41	0.40	0.25				0.85		0.83	0.14
Uniform Delay, d1	44.5	33.4	28.8	29.7	12.6				34.5		33.7	27.0
Progression Factor	0.91	0.67	0.46	1.61	1.92				1.00		1.00	1.00
Incremental Delay, d2	0.5	7.3	2.6	0.5	0.3				9.1		10.4	0.1
Delay (s)	40.8	29.6	15.8	48.4	24.4				43.6		44.1	27.1
Level of Service	D	C	B	D	C				D		D	C
Approach Delay (s)		26.3			31.2			43.6			38.2	
Approach LOS		C			C			D			D	

Intersection Summary				
HCM 2000 Control Delay	34.2	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.84			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	91.1%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
33: Nave Dr & Ignacio Blvd/Bel Marin Keys Blvd

02/15/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	737	1293	98	213	190	443	526	587	0	0	0
Future Volume (vph)	0	737	1293	98	213	190	443	526	587	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.6	3.0	4.0		4.6	4.6	3.0			
Lane Util. Factor		0.95	1.00	1.00	0.95		0.91	0.91	1.00			
Frpb, ped/bikes		1.00	1.00	1.00	0.99		1.00	1.00	0.99			
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00			
Frt		1.00	0.85	1.00	0.93		1.00	1.00	0.85			
Flt Protected		1.00	1.00	0.95	1.00		0.95	0.99	1.00			
Satd. Flow (prot)		3610	1607	1805	3303		1643	3397	1599			
Flt Permitted		1.00	1.00	0.95	1.00		0.95	0.99	1.00			
Satd. Flow (perm)		3610	1607	1805	3303		1643	3397	1599			
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)	0	784	1376	104	227	202	471	560	624	0	0	0
RTOR Reduction (vph)	0	0	84	0	114	0	0	0	10	0	0	0
Lane Group Flow (vph)	0	784	1292	104	315	0	334	697	614	0	0	0
Confl. Peds. (#/hr)			1			1			1			
Heavy Vehicles (%)	0%	0%	0%	0%	0%	2%	0%	1%	0%	0%	0%	0%
Turn Type		NA	pm+ov	Prot	NA		Split	NA	pm+ov			
Protected Phases		2	3	1	6		3	3	1			
Permitted Phases			2						3			
Actuated Green, G (s)		28.4	76.4	12.0	43.4		48.0	48.0	60.0			
Effective Green, g (s)		28.4	76.4	12.0	43.4		48.0	48.0	60.0			
Actuated g/C Ratio		0.28	0.76	0.12	0.43		0.48	0.48	0.60			
Clearance Time (s)		4.0	4.6	3.0	4.0		4.6	4.6	3.0			
Vehicle Extension (s)		4.0	2.0	2.0	4.0		2.0	2.0	2.0			
Lane Grp Cap (vph)		1025	1227	216	1433		788	1630	959			
v/s Ratio Prot		0.22	c0.51	0.06	0.10		0.20	0.21	c0.08			
v/s Ratio Perm			0.30						0.31			
v/c Ratio		0.76	1.05	0.48	0.22		0.42	0.43	0.64			
Uniform Delay, d1		32.7	11.8	41.1	17.7		17.0	17.0	13.0			
Progression Factor		0.91	1.51	1.19	0.95		1.00	1.00	1.00			
Incremental Delay, d2		3.0	34.8	0.6	0.4		0.1	0.1	1.0			
Delay (s)		32.7	52.7	49.4	17.2		17.1	17.1	14.0			
Level of Service		C	D	D	B		B	B	B			
Approach Delay (s)		45.4			23.4			15.9			0.0	
Approach LOS		D			C			B			A	

Intersection Summary				
HCM 2000 Control Delay	31.5	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	1.00			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.6	
Intersection Capacity Utilization	97.3%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
34: Bel Marin Keys Blvd & Commercial Blvd

11/22/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	11	73	0	9	46	1055	230	12	410	1
Future Volume (vph)	0	0	11	73	0	9	46	1055	230	12	410	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	3.0	3.9		3.0	3.5	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.86			1.00	0.85	1.00	0.97		1.00	1.00	
Flt Protected		1.00			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1620			1801	1395	1805	3496		1805	3573	
Flt Permitted		1.00			0.75	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1620			1421	1395	1805	3496		1805	3573	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	12	77	0	9	48	1111	242	13	432	1
RTOR Reduction (vph)	0	11	0	0	0	8	0	10	0	0	0	0
Lane Group Flow (vph)	0	1	0	0	77	1	48	1343	0	13	433	0
Confl. Peds. (#/hr)	3		2	2		3			3			
Heavy Vehicles (%)	2%	0%	0%	0%	0%	14%	0%	0%	0%	0%	1%	0%
Turn Type		NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		12.1			12.1	12.1	5.3	75.2		1.8	72.1	
Effective Green, g (s)		12.1			12.1	12.1	5.3	75.2		1.8	72.1	
Actuated g/C Ratio		0.12			0.12	0.12	0.05	0.75		0.02	0.72	
Clearance Time (s)		4.0			4.0	4.0	3.0	3.9		3.0	3.5	
Vehicle Extension (s)		3.0			3.0	3.0	2.5	3.0		2.5	4.0	
Lane Grp Cap (vph)		196			171	168	95	2628		32	2576	
v/s Ratio Prot		0.00					c0.03	c0.38		0.01	0.12	
v/s Ratio Perm					c0.05	0.00						
v/c Ratio		0.01			0.45	0.01	0.51	0.51		0.41	0.17	
Uniform Delay, d1		38.7			40.9	38.7	46.1	5.0		48.6	4.4	
Progression Factor		1.00			1.00	1.00	0.90	0.61		0.92	1.36	
Incremental Delay, d2		0.0			1.9	0.0	2.1	0.5		6.0	0.1	
Delay (s)		38.7			42.7	38.7	43.6	3.6		50.5	6.2	
Level of Service		D			D	D	D	A		D	A	
Approach Delay (s)		38.7			42.3			4.9			7.5	
Approach LOS		D			D			A			A	

Intersection Summary				
HCM 2000 Control Delay	7.4	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.52			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.9	
Intersection Capacity Utilization	59.4%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
35: Bel Marin Keys Blvd & Hamilton Dr/Digital Dr 11/22/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1	46	75	2	9	104	490	468	9	302	3
Future Volume (vph)	0	1	46	75	2	9	104	490	468	9	302	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	3.5	3.5	3.5		3.0	4.0		3.0	4.0	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.99	1.00	0.99		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	0.85	1.00	0.88		1.00	0.93		1.00	1.00	
Flt Protected		1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1900	1533	1803	1649		1770	3306		1805	3568	
Flt Permitted		1.00	1.00	0.76	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1900	1533	1437	1649		1770	3306		1805	3568	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1	48	79	2	9	109	516	493	9	318	3
RTOR Reduction (vph)	0	0	42	0	8	0	0	81	0	0	0	0
Lane Group Flow (vph)	0	1	6	79	3	0	109	928	0	9	321	0
Confl. Peds. (#/hr)	1		1	1		1			2			8
Heavy Vehicles (%)	0%	0%	4%	0%	0%	0%	2%	0%	0%	0%	1%	0%
Turn Type		NA	Perm	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8								
Actuated Green, G (s)		12.1	12.1	12.1	12.1		11.2	75.6		1.8	66.2	
Effective Green, g (s)		12.1	12.1	12.1	12.1		11.2	75.6		1.8	66.2	
Actuated g/C Ratio		0.12	0.12	0.12	0.12		0.11	0.76		0.02	0.66	
Clearance Time (s)		3.5	3.5	3.5	3.5		3.0	4.0		3.0	4.0	
Vehicle Extension (s)		2.0	2.0	2.5	2.5		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)		229	185	173	199		198	2499		32	2362	
v/s Ratio Prot		0.00			0.00		c0.06	c0.28		0.00	0.09	
v/s Ratio Perm			0.00	c0.05								
v/c Ratio		0.00	0.03	0.46	0.02		0.55	0.37		0.28	0.14	
Uniform Delay, d1		38.7	38.8	40.9	38.7		42.0	4.1		48.5	6.3	
Progression Factor		1.00	1.00	1.00	1.00		1.08	1.34		1.00	1.00	
Incremental Delay, d2		0.0	0.0	1.4	0.0		1.7	0.4		1.8	0.1	
Delay (s)		38.7	38.8	42.3	38.7		47.0	5.9		50.2	6.4	
Level of Service		D	D	D	D		D	A		D	A	
Approach Delay (s)		38.8			41.8			9.9			7.6	
Approach LOS		D			D			A			A	

Intersection Summary				
HCM 2000 Control Delay	12.2	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.42			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.5	
Intersection Capacity Utilization	57.3%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
36: Nave Dr & US 101 NB Off Ramp 11/22/2017

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	696	174	0	860	1189	188
Future Volume (vph)	696	174	0	860	1189	188
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		5.0	5.0	
Lane Util. Factor	0.97	1.00		0.95	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	0.98	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3467	1563		3574	3506	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3467	1563		3574	3506	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	757	189	0	935	1292	204
RTOR Reduction (vph)	0	20	0	0	18	0
Lane Group Flow (vph)	757	169	0	935	1478	0
Confl. Peds. (#/hr)		1				
Heavy Vehicles (%)	1%	2%	0%	1%	1%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	27.0	27.0		35.0	35.0	
Effective Green, g (s)	27.0	27.0		35.0	35.0	
Actuated g/C Ratio	0.39	0.39		0.50	0.50	
Clearance Time (s)	3.0	3.0		5.0	5.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	1337	602		1787	1753	
v/s Ratio Prot	c0.22			0.26	c0.42	
v/s Ratio Perm		0.11				
v/c Ratio	0.57	0.28		0.52	0.84	
Uniform Delay, d1	16.9	14.8		11.9	15.1	
Progression Factor	1.00	1.00		0.37	1.00	
Incremental Delay, d2	1.7	1.2		1.0	5.1	
Delay (s)	18.6	16.0		5.3	20.3	
Level of Service	B	B		A	C	
Approach Delay (s)	18.1			5.3	20.3	
Approach LOS	B			A	C	

Intersection Summary			
HCM 2000 Control Delay	15.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	68.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
37: Nave Dr & Hamilton Center

11/22/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	38	20	697	82	97	1114
Future Volume (vph)	38	20	697	82	97	1114
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.2	3.2	4.4		3.0	4.4
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	1615	1868		1770	1881
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1805	1615	1868		1770	1881
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	42	22	766	90	107	1224
RTOR Reduction (vph)	0	21	5	0	0	0
Lane Group Flow (vph)	42	1	851	0	107	1224
Confl. Peds. (#/hr)				2		
Heavy Vehicles (%)	0%	0%	0%	0%	2%	1%
Turn Type	Prot	Perm	NA		Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8				
Actuated Green, G (s)	3.6	3.6	48.6		7.2	58.8
Effective Green, g (s)	3.6	3.6	48.6		7.2	58.8
Actuated g/C Ratio	0.05	0.05	0.69		0.10	0.84
Clearance Time (s)	3.2	3.2	4.4		3.0	4.4
Vehicle Extension (s)	1.0	1.0	1.0		1.0	1.0
Lane Grp Cap (vph)	92	83	1296		182	1580
v/s Ratio Prot	c0.02		0.46		0.06	c0.65
v/s Ratio Perm		0.00				
v/c Ratio	0.46	0.01	0.66		0.59	0.77
Uniform Delay, d1	32.2	31.5	6.0		30.0	2.6
Progression Factor	1.00	1.00	0.73		1.28	1.58
Incremental Delay, d2	1.3	0.0	2.1		1.9	2.3
Delay (s)	33.6	31.5	6.4		40.3	6.4
Level of Service	C	C	A		D	A
Approach Delay (s)	32.9		6.4			9.1
Approach LOS	C		A			A

Intersection Summary				
HCM 2000 Control Delay	8.8	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.79			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	10.6	
Intersection Capacity Utilization	70.6%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
38: Nave Dr & Hamilton Pkwy

11/22/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	119	265	484	41	357	762
Future Volume (vph)	119	265	484	41	357	762
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.2	3.2	4.4	4.4	3.0	4.4
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1599	1900	1578	1787	1850
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1599	1900	1578	1787	1900
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	131	291	532	45	392	837
RTOR Reduction (vph)	0	251	0	13	0	0
Lane Group Flow (vph)	131	40	532	32	392	837
Confl. Peds. (#/hr)				2		
Heavy Vehicles (%)	2%	1%	0%	0%	1%	0%
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Actuated Green, G (s)	9.7	9.7	25.4	25.4	24.3	52.7
Effective Green, g (s)	9.7	9.7	25.4	25.4	24.3	52.7
Actuated g/C Ratio	0.14	0.14	0.36	0.36	0.35	0.75
Clearance Time (s)	3.2	3.2	4.4	4.4	3.0	4.4
Vehicle Extension (s)	2.0	2.0	3.0	3.0	2.0	3.0
Lane Grp Cap (vph)	245	221	689	572	620	1392
v/s Ratio Prot	c0.07		c0.28		c0.22	0.45
v/s Ratio Perm		0.03		0.02		
v/c Ratio	0.53	0.18	0.77	0.06	0.63	0.60
Uniform Delay, d1	28.1	26.6	19.7	14.5	19.1	3.9
Progression Factor	1.00	1.00	1.00	1.00	1.25	0.67
Incremental Delay, d2	1.1	0.1	8.2	0.2	1.1	1.3
Delay (s)	29.2	26.8	27.9	14.7	24.9	3.9
Level of Service	C	C	C	B	C	A
Approach Delay (s)	27.5		26.9			10.6
Approach LOS	C		C			B

Intersection Summary				
HCM 2000 Control Delay	18.0	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.68			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	10.6	
Intersection Capacity Utilization	62.2%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
39: Nave Dr & Main Gate Dr

11/22/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	264	175	226	459	292	335
Future Volume (vph)	264	175	226	459	292	335
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	4.1	4.1	3.0	4.4
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1805	1615	1900	1615	1805	1881
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1805	1615	1900	1615	1805	1881
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	284	188	243	494	314	360
RTOR Reduction (vph)	0	140	0	369	0	0
Lane Group Flow (vph)	284	48	243	125	314	360
Heavy Vehicles (%)	0%	0%	0%	0%	0%	1%
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Actuated Green, G (s)	11.4	11.4	11.4	11.4	12.2	26.3
Effective Green, g (s)	11.4	11.4	11.4	11.4	12.2	26.3
Actuated g/C Ratio	0.25	0.25	0.25	0.25	0.27	0.58
Clearance Time (s)	3.0	3.0	4.1	4.1	3.0	4.4
Vehicle Extension (s)	2.0	2.0	1.0	1.0	1.0	1.0
Lane Grp Cap (vph)	456	408	480	408	488	1096
v/s Ratio Prot	c0.16		c0.13		c0.17	0.19
v/s Ratio Perm		0.03		0.08		
v/c Ratio	0.62	0.12	0.51	0.31	0.64	0.33
Uniform Delay, d1	14.9	13.0	14.4	13.6	14.5	4.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.9	0.0	0.3	0.2	2.2	0.1
Delay (s)	16.9	13.0	14.7	13.8	16.7	4.9
Level of Service	B	B	B	B	B	A
Approach Delay (s)	15.3		14.1			10.4
Approach LOS	B		B			B

Intersection Summary				
HCM 2000 Control Delay	13.1	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.59			
Actuated Cycle Length (s)	45.1	Sum of lost time (s)	10.1	
Intersection Capacity Utilization	52.8%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
40: Nave Dr & Bolling Dr

11/22/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	336	110	517	98	83	530
Future Volume (vph)	336	110	517	98	83	530
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	4.1		3.0	3.5
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	0.97	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.98		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1787	1571	1844		1805	1881
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1787	1571	1844		1805	1881
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	369	121	568	108	91	582
RTOR Reduction (vph)	0	86	9	0	0	0
Lane Group Flow (vph)	369	35	667	0	91	582
Confl. Peds. (#/hr)		6				
Heavy Vehicles (%)	1%	0%	1%	0%	0%	1%
Turn Type	Prot	Perm	NA		Prot	NA
Protected Phases	4		6		5	2
Permitted Phases		4				
Actuated Green, G (s)	17.5	17.5	25.6		6.5	35.7
Effective Green, g (s)	17.5	17.5	25.6		6.5	35.7
Actuated g/C Ratio	0.29	0.29	0.43		0.11	0.60
Clearance Time (s)	3.0	3.0	4.1		3.0	3.5
Vehicle Extension (s)	2.0	2.0	2.0		2.0	2.0
Lane Grp Cap (vph)	523	460	790		196	1124
v/s Ratio Prot	c0.21		c0.36		0.05	c0.31
v/s Ratio Perm		0.02				
v/c Ratio	0.71	0.08	0.84		0.46	0.52
Uniform Delay, d1	18.8	15.3	15.3		25.0	7.0
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	3.5	0.0	7.9		0.6	0.2
Delay (s)	22.3	15.3	23.2		25.6	7.2
Level of Service	C	B	C		C	A
Approach Delay (s)	20.6		23.2			9.7
Approach LOS	C		C			A

Intersection Summary				
HCM 2000 Control Delay	17.5	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.76			
Actuated Cycle Length (s)	59.7	Sum of lost time (s)	10.1	
Intersection Capacity Utilization	69.6%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Intersection	
Intersection Delay, s/veh	32.1
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	125	11	0	63	117	618	2	157	43	109	21	6
Future Vol, veh/h	125	11	0	63	117	618	2	157	43	109	21	6
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	132	12	0	66	123	651	2	165	45	115	22	6
Number of Lanes	0	1	0	0	1	1	0	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	2	1
HCM Control Delay	13.3	42.8	15.5	13.1
HCM LOS	B	E	C	B

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	1%	92%	35%	0%	100%	0%
Vol Thru, %	78%	8%	65%	0%	0%	78%
Vol Right, %	21%	0%	0%	100%	0%	22%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	202	136	180	618	109	27
LT Vol	2	125	63	0	109	0
Through Vol	157	11	117	0	0	21
RT Vol	43	0	0	618	0	6
Lane Flow Rate	213	143	189	651	115	28
Geometry Grp	6	6	7	7	7	7
Degree of Util (X)	0.427	0.29	0.33	0.974	0.259	0.059
Departure Headway (Hd)	7.221	7.304	6.279	5.392	8.116	7.444
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	502	492	568	664	444	483
Service Time	5.221	5.333	4.075	3.187	5.832	5.159
HCM Lane V/C Ratio	0.424	0.291	0.333	0.98	0.259	0.058
HCM Control Delay	15.5	13.3	12.2	51.7	13.7	10.6
HCM Lane LOS	C	B	B	F	B	B
HCM 95th-tile Q	2.1	1.2	1.4	14.5	1	0.2

Intersection	
Intersection Delay, s/veh	100.8
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	12	448	96	320	941	32	112	16	158	19	12	12
Future Vol, veh/h	12	448	96	320	941	32	112	16	158	19	12	12
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	13	472	101	337	991	34	118	17	166	20	13	13
Number of Lanes	1	2	0	1	2	0	0	1	1	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	3	3	1	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	2	3	3
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	1	3	3
HCM Control Delay	36.1	148.9	22	16.9
HCM LOS	E	F	C	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1
Vol Left, %	88%	0%	100%	0%	0%	100%	0%	0%	44%
Vol Thru, %	12%	0%	0%	100%	61%	0%	100%	91%	28%
Vol Right, %	0%	100%	0%	0%	39%	0%	0%	9%	28%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	128	158	12	299	245	320	627	346	43
LT Vol	112	0	12	0	0	320	0	0	19
Through Vol	16	0	0	299	149	0	627	314	12
RT Vol	0	158	0	0	96	0	0	32	12
Lane Flow Rate	135	166	13	314	258	337	660	364	45
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.406	0.449	0.034	0.808	0.644	0.82	1.513	0.827	0.143
Departure Headway (Hd)	11.777	10.616	10.456	9.94	9.658	8.765	8.25	8.183	12.185
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	307	341	344	368	377	414	442	444	296
Service Time	9.477	8.316	8.156	7.64	7.358	6.509	5.993	5.926	9.885
HCM Lane V/C Ratio	0.44	0.487	0.038	0.853	0.684	0.814	1.493	0.82	0.152
HCM Control Delay	22.3	21.7	13.5	43.5	28.3	40.9	264.1	39.7	16.9
HCM Lane LOS	C	C	B	E	D	E	F	E	C
HCM 95th-tile Q	1.9	2.2	0.1	7	4.3	7.5	34.9	7.8	0.5

MOVEMENT SUMMARY

Site: 1 [PM E+P Alt]

Simmons Lane/San Marin Drive
PM Existing plus Project Alternative

Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NB Simmons Ln											
3	L2	118	2.0	0.376	9.1	LOS A	1.9	47.2	0.65	0.64	31.9
8	T1	17	2.0	0.376	9.1	LOS A	1.9	47.2	0.65	0.64	31.9
18	R2	166	2.0	0.376	9.1	LOS A	1.9	47.2	0.65	0.64	31.1
Approach		301	2.0	0.376	9.1	LOS A	1.9	47.2	0.65	0.64	31.4
East: WB San Marin Drive											
1	L2	337	2.0	0.277	5.5	LOS A	1.4	34.3	0.33	0.20	32.1
6	T1	991	2.0	0.844	20.6	LOS C	13.7	348.0	0.90	0.65	28.1
16	R2	34	2.0	0.844	20.6	LOS C	13.7	348.0	0.90	0.65	27.4
Approach		1361	2.0	0.844	16.9	LOS B	13.7	348.0	0.76	0.54	29.0
North: SB Simmons Ln											
7	L2	20	2.0	0.114	10.8	LOS B	0.4	9.1	0.74	0.74	31.0
4	T1	13	2.0	0.114	10.8	LOS B	0.4	9.1	0.74	0.74	31.0
14	R2	13	2.0	0.114	10.8	LOS B	0.4	9.1	0.74	0.74	30.3
Approach		45	2.0	0.114	10.8	LOS B	0.4	9.1	0.74	0.74	30.8
West: EB San Marin Drive											
5	L2	13	2.0	0.635	13.6	LOS B	5.4	136.3	0.76	0.78	30.8
2	T1	472	2.0	0.635	13.6	LOS B	5.4	136.3	0.76	0.78	30.8
12	R2	101	2.0	0.635	13.6	LOS B	5.4	136.3	0.76	0.78	30.0
Approach		585	2.0	0.635	13.6	LOS B	5.4	136.3	0.76	0.78	30.7
All Vehicles		2293	2.0	0.844	14.9	LOS B	13.7	348.0	0.74	0.62	29.7

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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LANE SUMMARY

Site: 1 [PM E+P Alt]

Simmons Lane/San Marin Drive
PM Existing plus Project Alternative

Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: NB Simmons Ln													
Lane 1[d]	301	2.0	801	0.376	100	9.1	LOS A	1.9	47.2	Full	1600	0.0	0.0
Approach	301	2.0		0.376		9.1	LOS A	1.9	47.2				
East: WB San Marin Drive													
Lane 1	337	2.0	1214	0.277	100	5.5	LOS A	1.4	34.3	Short	100	0.0	NA
Lane 2[d]	1024	2.0	1214	0.844	100	20.6	LOS C	13.7	348.0	Full	1600	0.0	0.0
Approach	1361	2.0		0.844		16.9	LOS B	13.7	348.0				
North: SB Simmons Ln													
Lane 1[d]	45	2.0	398	0.114	100	10.8	LOS B	0.4	9.1	Full	1600	0.0	0.0
Approach	45	2.0		0.114		10.8	LOS B	0.4	9.1				
West: EB San Marin Drive													
Lane 1[d]	585	2.0	921	0.635	100	13.6	LOS B	5.4	136.3	Full	1600	0.0	0.0
Approach	585	2.0		0.635		13.6	LOS B	5.4	136.3				
Intersection	2293	2.0		0.844		14.9	LOS B	13.7	348.0				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	448	96	320	941	32	112	16	158	19	12	12
Future Volume (vph)	12	448	96	320	941	32	112	16	158	19	12	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.98	
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583		1785	1583		1754	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.72	1.00		0.86	
Satd. Flow (perm)	1770	1863	1583	1770	1863	1583		1341	1583		1545	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	13	472	101	337	991	34	118	17	166	20	13	13
RTOR Reduction (vph)	0	0	63	0	0	13	0	0	91	0	11	0
Lane Group Flow (vph)	13	472	38	337	991	21	0	135	75	0	35	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	pm+ov	Perm	NA	
Protected Phases	7	4		3	8			2	3		6	
Permitted Phases			4			8	2		2	6		
Actuated Green, G (s)	0.6	26.8	26.8	18.2	44.4	44.4		13.4	31.6		13.4	
Effective Green, g (s)	0.6	26.8	26.8	18.2	44.4	44.4		13.4	31.6		13.4	
Actuated g/C Ratio	0.01	0.38	0.38	0.26	0.63	0.63		0.19	0.45		0.19	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	
Lane Grp Cap (vph)	15	709	602	457	1174	998		255	800		294	
v/s Ratio Prot	0.01	0.25		c0.19	c0.53				0.02			
v/s Ratio Perm			0.02			0.01		c0.10	0.02		0.02	
v/c Ratio	0.87	0.67	0.06	0.74	0.84	0.02		0.53	0.09		0.12	
Uniform Delay, d1	34.9	18.1	13.8	23.9	10.3	4.9		25.7	11.2		23.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2	162.9	2.4	0.0	6.1	5.7	0.0		2.0	0.1		0.2	
Delay (s)	197.8	20.5	13.9	30.0	16.0	4.9		27.6	11.2		23.8	
Level of Service	F	C	B	C	B	A		C	B		C	
Approach Delay (s)		23.3			19.2			18.6			23.8	
Approach LOS		C			B			B			C	

Intersection Summary			
HCM 2000 Control Delay	20.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	70.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	75.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
2: W Campus Dr & San Marin Dr

11/22/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	664	0	3	1315	15	0	0	0	67	0	8
Future Volume (vph)	3	664	0	3	1315	15	0	0	0	67	0	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.8		4.0	4.8	4.8				4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00				0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00				1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00				1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85				1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00				0.95	0.95	1.00
Satd. Flow (prot)	1805	3574		1805	3574	1615				1715	1715	1615
Flt Permitted	0.95	1.00		0.95	1.00	1.00				0.82	0.82	1.00
Satd. Flow (perm)	1805	3574		1805	3574	1615				1473	1473	1615
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	3	699	0	3	1384	16	0	0	0	71	0	8
RTOR Reduction (vph)	0	0	0	0	0	6	0	0	0	0	0	7
Lane Group Flow (vph)	3	699	0	3	1384	10	0	0	0	35	36	1
Confl. Peds. (#/hr)			2									
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA	Perm				Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8			4		4
Actuated Green, G (s)	1.3	30.3		1.2	30.2	30.2				4.9	4.9	4.9
Effective Green, g (s)	1.3	30.3		1.2	30.2	30.2				4.9	4.9	4.9
Actuated g/C Ratio	0.03	0.62		0.02	0.61	0.61				0.10	0.10	0.10
Clearance Time (s)	4.0	4.8		4.0	4.8	4.8				4.0	4.0	4.0
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0				2.0	2.0	2.0
Lane Grp Cap (vph)	47	2201		44	2193	991				146	146	160
v/s Ratio Prot	c0.00	0.20		0.00	c0.39							
v/s Ratio Perm						0.01				0.02	c0.02	0.00
v/c Ratio	0.06	0.32		0.07	0.63	0.01				0.24	0.25	0.00
Uniform Delay, d1	23.4	4.5		23.5	6.0	3.7				20.4	20.4	20.0
Progression Factor	1.00	1.00		1.00	1.00	1.00				1.00	1.00	1.00
Incremental Delay, d2	0.2	0.1		0.2	0.7	0.0				0.3	0.3	0.0
Delay (s)	23.6	4.6		23.7	6.7	3.7				20.7	20.8	20.0
Level of Service	C	A		C	A	A				C	C	B
Approach Delay (s)		4.7			6.7			0.0			20.7	
Approach LOS		A			A			A			C	

Intersection Summary				
HCM 2000 Control Delay	6.5	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.56			
Actuated Cycle Length (s)	49.2	Sum of lost time (s)	12.8	
Intersection Capacity Utilization	52.0%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: San Marin Dr & E Campus Drive

11/22/2017

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	1	737	1337	47	49	3
Future Volume (vph)	1	737	1337	47	49	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.3	4.3	4.3	3.0	3.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1805	3574	3574	1615	3502	1595
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1805	3574	3574	1615	3502	1595
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	1	768	1393	49	51	3
RTOR Reduction (vph)	0	0	0	16	0	3
Lane Group Flow (vph)	1	768	1393	33	51	0
Confl. Peds. (#/hr)						1
Heavy Vehicles (%)	0%	1%	1%	0%	0%	0%
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Actuated Green, G (s)	1.0	38.5	34.5	34.5	5.6	5.6
Effective Green, g (s)	1.0	38.5	34.5	34.5	5.6	5.6
Actuated g/C Ratio	0.02	0.75	0.67	0.67	0.11	0.11
Clearance Time (s)	3.0	4.3	4.3	4.3	3.0	3.0
Vehicle Extension (s)	2.0	4.0	4.0	4.0	2.0	2.0
Lane Grp Cap (vph)	35	2677	2398	1083	381	173
v/s Ratio Prot	0.00	c0.21	c0.39		c0.01	
v/s Ratio Perm				0.02		0.00
v/c Ratio	0.03	0.29	0.58	0.03	0.13	0.00
Uniform Delay, d1	24.7	2.1	4.6	2.8	20.7	20.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.1	0.4	0.0	0.1	0.0
Delay (s)	24.8	2.1	5.0	2.9	20.8	20.4
Level of Service	C	A	A	A	C	C
Approach Delay (s)		2.2	4.9		20.7	
Approach LOS		A	A		C	

Intersection Summary			
HCM 2000 Control Delay	4.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	51.4	Sum of lost time (s)	10.3
Intersection Capacity Utilization	49.6%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
4: Redwood Blvd & San Marin Dr 11/22/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	601	178	386	952	202	291	95	518	629	150	100
Future Volume (vph)	29	601	178	386	952	202	291	95	518	629	150	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.6		3.0	4.0		4.3	4.3	4.3	4.3	4.3	
Lane Util. Factor	1.00	0.91		1.00	0.91		0.97	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	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	1.00	
Frt	1.00	0.97		1.00	0.97		1.00	1.00	0.85	1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1787	4942		1752	5001		3467	1881	1568	1787	1756	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1787	4942		1752	5001		3467	1881	1568	1787	1756	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	31	633	187	406	1002	213	306	100	545	662	158	105
RTOR Reduction (vph)	0	43	0	0	26	0	0	0	209	0	19	0
Lane Group Flow (vph)	31	777	0	406	1189	0	306	100	336	662	244	0
Confl. Peds. (#/hr)			4									5
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	1%	1%	1%	3%	1%	1%	1%	1%	3%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA		Split	NA	Perm	Split	NA	
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases					2				7			
Actuated Green, G (s)	6.0	40.0		14.2	47.8		16.9	16.9	16.9	43.7	43.7	
Effective Green, g (s)	6.0	40.0		14.2	47.8		16.9	16.9	16.9	43.7	43.7	
Actuated g/C Ratio	0.05	0.31		0.11	0.37		0.13	0.13	0.13	0.34	0.34	
Clearance Time (s)	3.0	3.6		3.0	4.0		4.3	4.3	4.3	4.3	4.3	
Vehicle Extension (s)	2.0	4.0		5.0	4.0		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	82	1520		191	1838		450	244	203	600	590	
v/s Ratio Prot	0.02	c0.16		c0.23	c0.24		0.09	0.05		c0.37	0.14	
v/s Ratio Perm									c0.21			
v/c Ratio	0.38	0.51		2.13	0.65		0.68	0.41	1.66	1.10	0.41	
Uniform Delay, d1	60.2	37.0		57.9	34.1		54.0	52.0	56.5	43.1	33.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.1	0.4		523.8	1.8		3.4	0.4	316.2	68.3	0.2	
Delay (s)	61.3	37.4		581.7	35.9		57.3	52.4	372.7	111.5	33.5	
Level of Service	E	D		F	D		E	D	F	F	C	
Approach Delay (s)		38.2			172.6			237.6			89.3	
Approach LOS		D			F			F			F	

Intersection Summary				
HCM 2000 Control Delay	142.8	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	1.15			
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	15.6	
Intersection Capacity Utilization	96.7%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
4: Redwood Blvd & San Marin Dr 06/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	601	178	386	952	202	291	95	518	629	150	100
Future Volume (vph)	29	601	178	386	952	202	291	95	518	629	150	100
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.6		3.0	4.0	4.3	4.3	4.3	3.0	4.3	4.3	
Lane Util. Factor	1.00	0.91		0.97	0.95	1.00	0.95	0.95	0.88	0.91	0.91	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	0.98	1.00	0.95	0.97	
Satd. Flow (prot)	1787	4942		3400	3574	1599	1698	1743	2760	1626	3232	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	0.98	1.00	0.95	0.97	
Satd. Flow (perm)	1787	4942		3400	3574	1599	1698	1743	2760	1626	3232	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	31	633	187	406	1002	213	306	100	545	662	158	105
RTOR Reduction (vph)	0	35	0	0	0	64	0	0	87	0	14	0
Lane Group Flow (vph)	31	785	0	406	1002	149	202	204	458	331	580	0
Confl. Peds. (#/hr)			4									5
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	1%	1%	1%	3%	1%	1%	1%	1%	3%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA	pm+ov	Split	NA	
Protected Phases	5	2		1	6	4	8	8	1	4	4	
Permitted Phases						6			8			
Actuated Green, G (s)	6.0	51.7		19.2	64.5	98.2	20.2	20.2	39.4	33.7	33.7	
Effective Green, g (s)	6.0	51.7		19.2	64.5	98.2	20.2	20.2	39.4	33.7	33.7	
Actuated g/C Ratio	0.04	0.37		0.14	0.46	0.70	0.14	0.14	0.28	0.24	0.24	
Clearance Time (s)	3.0	3.6		3.0	4.0	4.3	4.3	4.3	3.0	4.3	4.3	
Vehicle Extension (s)	2.0	4.0		5.0	4.0	2.0	2.0	2.0	5.0	2.0	2.0	
Lane Grp Cap (vph)	76	1825		466	1646	1121	244	251	776	391	777	
v/s Ratio Prot	0.02	c0.16		c0.12	c0.28	0.03	c0.12	0.12	0.08	c0.20	0.18	
v/s Ratio Perm						0.06			0.09			
v/c Ratio	0.41	0.43		0.87	0.61	0.13	0.83	0.81	0.59	0.85	0.75	
Uniform Delay, d1	65.3	33.1		59.2	28.3	6.9	58.2	58.1	43.3	50.7	49.2	
Progression Factor	1.00	1.00		0.77	0.57	2.04	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.3	0.7		16.0	1.5	0.0	19.2	17.0	1.8	14.9	3.5	
Delay (s)	66.6	33.8		61.8	17.7	14.0	77.4	75.1	45.2	65.6	52.7	
Level of Service	E	C		E	B	B	E	E	D	E	D	
Approach Delay (s)		35.0			28.3			58.4			57.3	
Approach LOS		D			C			E			E	

Intersection Summary				
HCM 2000 Control Delay	42.4	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.73			
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.6	
Intersection Capacity Utilization	92.3%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
5: US 101 SB Ramps & San Marin Dr 11/22/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	837	875	155	1255	0	0	0	0	54	2	338
Future Volume (vph)	0	837	875	155	1255	0	0	0	0	54	2	338
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9	4.9	3.0	5.3						4.0	4.0
Lane Util. Factor		0.95	1.00	1.00	0.95						1.00	0.88
Frpb, ped/bikes		1.00	0.98	1.00	1.00						1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		3574	1575	1805	3574						1812	2814
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		3574	1575	1805	3574						1812	2814
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	863	902	160	1294	0	0	0	0	56	2	348
RTOR Reduction (vph)	0	0	273	0	0	0	0	0	0	0	0	177
Lane Group Flow (vph)	0	863	629	160	1294	0	0	0	0	0	58	171
Confl. Peds. (#/hr)			4									
Heavy Vehicles (%)	0%	1%	1%	0%	1%	0%	0%	0%	0%	0%	0%	1%
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			2									4
Actuated Green, G (s)		41.8	41.8	9.0	53.4						7.3	7.3
Effective Green, g (s)		41.8	41.8	9.0	53.4						7.3	7.3
Actuated g/C Ratio		0.60	0.60	0.13	0.76						0.10	0.10
Clearance Time (s)		4.9	4.9	3.0	5.3						4.0	4.0
Vehicle Extension (s)		4.0	4.0	2.0	4.0						2.0	2.0
Lane Grp Cap (vph)		2134	940	232	2726						188	293
v/s Ratio Prot		0.24		c0.09	0.36						0.03	
v/s Ratio Perm			c0.40									c0.06
v/c Ratio		0.40	0.67	0.69	0.47						0.31	0.58
Uniform Delay, d1		7.5	9.5	29.2	3.1						29.0	29.9
Progression Factor		1.00	1.00	1.00	1.00						1.00	1.00
Incremental Delay, d2		0.6	3.8	6.6	0.6						0.3	1.9
Delay (s)		8.1	13.2	35.8	3.7						29.4	31.8
Level of Service		A	B	D	A						C	C
Approach Delay (s)		10.7			7.2			0.0			31.4	
Approach LOS		B			A			A			C	

Intersection Summary				
HCM 2000 Control Delay	11.6	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.66			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	11.9	
Intersection Capacity Utilization	118.8%	ICU Level of Service	H	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
6: US 101 NB Ramps & San Marin Dr 11/22/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	424	417	0	0	422	51	1086	108	196	0	0	0
Future Volume (vph)	424	417	0	0	422	51	1086	108	196	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.6			4.9	4.9	3.5	3.5				
Lane Util. Factor	0.97	1.00			0.95	1.00	0.95	0.95				
Frpb, ped/bikes	1.00	1.00			1.00	0.99	1.00	0.99				
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00				
Frt	1.00	1.00			1.00	0.85	1.00	0.96				
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.97				
Satd. Flow (prot)	3467	1881			3574	1593	1681	1638				
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.97				
Satd. Flow (perm)	3467	1881			3574	1593	1681	1638				
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)	442	434	0	0	440	53	1131	112	204	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	44	0	22	0	0	0	0
Lane Group Flow (vph)	442	434	0	0	440	9	735	691	0	0	0	0
Confl. Peds. (#/hr)			3			1			1	1		
Heavy Vehicles (%)	1%	1%	0%	0%	1%	0%	2%	0%	3%	0%	0%	0%
Turn Type	Prot	NA			NA	Perm	Split	NA				
Protected Phases	5	2			6		8	8				
Permitted Phases						6						
Actuated Green, G (s)	10.1	25.6			11.7	11.7	31.6	31.6				
Effective Green, g (s)	10.1	25.6			11.7	11.7	31.6	31.6				
Actuated g/C Ratio	0.15	0.39			0.18	0.18	0.48	0.48				
Clearance Time (s)	3.5	4.6			4.9	4.9	3.5	3.5				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	2.5	2.5				
Lane Grp Cap (vph)	536	737			640	285	813	792				
v/s Ratio Prot	c0.13	c0.23			0.12		c0.44	0.42				
v/s Ratio Perm						0.01						
v/c Ratio	0.82	0.59			0.69	0.03	0.90	0.87				
Uniform Delay, d1	26.7	15.7			25.1	22.1	15.5	15.1				
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00				
Incremental Delay, d2	9.5	1.4			3.3	0.1	13.4	10.4				
Delay (s)	36.3	17.1			28.4	22.2	28.8	25.4				
Level of Service	D	B			C	C	C	C				
Approach Delay (s)		26.8			27.8			27.2			0.0	
Approach LOS		C			C			C			A	

Intersection Summary				
HCM 2000 Control Delay	27.1	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.85			
Actuated Cycle Length (s)	65.3	Sum of lost time (s)	11.9	
Intersection Capacity Utilization	118.8%	ICU Level of Service	H	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
7: Redwood Blvd & Olive St

11/22/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	150	73	34	176	107	109	75	801	201	125	474	142
Future Volume (vph)	150	73	34	176	107	109	75	801	201	125	474	142
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.1	5.1			5.1		4.0	3.9	3.9	4.0	3.9	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.95			0.96		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00			0.98		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1774			1753		1770	3539	1583	1770	3417	
Flt Permitted	0.95	1.00			0.98		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1774			1753		1770	3539	1583	1770	3417	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	158	77	36	185	113	115	79	843	212	132	499	149
RTOR Reduction (vph)	0	17	0	0	12	0	0	0	79	0	24	0
Lane Group Flow (vph)	158	96	0	0	401	0	79	843	133	132	624	0
Turn Type	Split	NA		Split	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	13.3	13.3			25.1		7.7	26.9	26.9	10.1	29.3	
Effective Green, g (s)	13.3	13.3			25.1		7.7	26.9	26.9	10.1	29.3	
Actuated g/C Ratio	0.14	0.14			0.27		0.08	0.29	0.29	0.11	0.31	
Clearance Time (s)	5.1	5.1			5.1		4.0	3.9	3.9	4.0	3.9	
Vehicle Extension (s)	1.0	1.0			1.0		1.0	1.0	1.0	1.0	1.0	
Lane Grp Cap (vph)	251	252			470		145	1018	455	191	1070	
v/s Ratio Prot	c0.09	0.05			c0.23		0.04	c0.24		c0.07	0.18	
v/s Ratio Perm									0.08			
v/c Ratio	0.63	0.38			0.85		0.54	0.83	0.29	0.69	0.58	
Uniform Delay, d1	37.8	36.4			32.4		41.2	31.1	25.9	40.2	27.0	
Progression Factor	1.00	1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.5	0.4			13.4		2.2	5.4	0.1	8.4	0.5	
Delay (s)	41.3	36.7			45.9		43.5	36.5	26.0	48.6	27.5	
Level of Service	D	D			D		D	D	C	D	C	
Approach Delay (s)		39.4			45.9			35.0			31.1	
Approach LOS		D			D			D			C	

Intersection Summary				
HCM 2000 Control Delay	36.0	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.77			
Actuated Cycle Length (s)	93.5	Sum of lost time (s)	18.1	
Intersection Capacity Utilization	70.1%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
8: Redwood Blvd & Grant Ave

11/22/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	124	141	312	45	176	85	405	625	71	60	509	157
Future Volume (vph)	124	141	312	45	176	85	405	625	71	60	509	157
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5		3.5	3.7	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.96	1.00	1.00	0.96	1.00	0.99		1.00	0.99	
Flpb, ped/bikes	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	1900	1528	1803	1900	1557	1805	3460		1805	3394	
Flt Permitted	0.56	1.00	1.00	0.63	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1038	1900	1528	1192	1900	1557	1805	3460		1805	3394	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	131	148	328	47	185	89	426	658	75	63	536	165
RTOR Reduction (vph)	0	0	241	0	0	66	0	8	0	0	27	0
Lane Group Flow (vph)	131	148	87	47	185	23	426	725	0	63	674	0
Confl. Peds. (#/hr)	22		46	2		34			36			10
Confl. Bikes (#/hr)			5			5			5			5
Heavy Vehicles (%)	2%	0%	1%	0%	0%	0%	0%	2%	0%	0%	2%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8		8	4		4						
Actuated Green, G (s)	20.3	20.3	20.3	20.3	20.3	20.3	23.3	33.9		11.7	22.1	
Effective Green, g (s)	20.3	20.3	20.3	20.3	20.3	20.3	23.3	33.9		11.7	22.1	
Actuated g/C Ratio	0.26	0.26	0.26	0.26	0.26	0.26	0.30	0.44		0.15	0.29	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5		3.5	3.7	
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0	4.0	2.5	3.0		2.5	3.0	
Lane Grp Cap (vph)	274	501	403	314	501	411	546	1525		274	975	
v/s Ratio Prot		0.08			0.10		c0.24	0.21		0.03	c0.20	
v/s Ratio Perm	c0.13		0.06	0.04		0.02						
v/c Ratio	0.48	0.30	0.21	0.15	0.37	0.06	0.78	0.48		0.23	0.69	
Uniform Delay, d1	23.8	22.6	22.1	21.7	23.1	21.1	24.5	15.2		28.6	24.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.8	0.5	0.4	0.3	0.6	0.1	6.9	0.2		0.3	2.1	
Delay (s)	25.6	23.0	22.4	22.0	23.7	21.2	31.3	15.4		29.0	26.5	
Level of Service	C	C	C	C	C	C	C	B		C	C	
Approach Delay (s)		23.3			22.8			21.3			26.7	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM 2000 Control Delay	23.3	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.66			
Actuated Cycle Length (s)	76.9	Sum of lost time (s)	11.2	
Intersection Capacity Utilization	92.3%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	89.6
Intersection LOS	F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	89	156	54	74	300	192	66	129	58	177	230	413
Future Vol, veh/h	89	156	54	74	300	192	66	129	58	177	230	413
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	94	164	57	78	316	202	69	136	61	186	242	435
Number of Lanes	1	1	0	1	1	0	1	1	0	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	3	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	3	2	2
HCM Control Delay	28.5	196.3	26.4	57.8
HCM LOS	D	F	D	F

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%	0%
Vol Thru, %	0%	69%	0%	74%	0%	61%	0%	100%	0%
Vol Right, %	0%	31%	0%	26%	0%	39%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	66	187	89	210	74	492	177	230	413
LT Vol	66	0	89	0	74	0	177	0	0
Through Vol	0	129	0	156	0	300	0	230	0
RT Vol	0	58	0	54	0	192	0	0	413
Lane Flow Rate	69	197	94	221	78	518	186	242	435
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.218	0.577	0.288	0.638	0.227	1.401	0.507	0.625	1.039
Departure Headway (Hd)	12.467	11.703	12.129	11.414	10.841	10.041	10.802	10.278	9.544
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	290	311	298	318	333	368	335	353	383
Service Time	10.167	9.403	9.829	9.114	8.541	7.74	8.502	7.978	7.244
HCM Lane V/C Ratio	0.238	0.633	0.315	0.695	0.234	1.408	0.555	0.686	1.136
HCM Control Delay	18.6	29.2	19.7	32.2	16.7	223.3	24.1	28.7	88.4
HCM Lane LOS	C	D	C	D	C	F	C	D	F
HCM 95th-tile Q	0.8	3.4	1.2	4.1	0.9	25.4	2.7	4	13.1

MOVEMENT SUMMARY

Site: 9 [PM Existing + Project Alt]

Novato Boulevard/San Marin Dr-Sutro Ave
PM Existing + Project Alternative

Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NB Sutro Ave											
3	L2	69	2.0	0.312	7.7	LOS A	1.5	37.7	0.59	0.55	32.9
8	T1	136	2.0	0.312	7.7	LOS A	1.5	37.7	0.59	0.55	32.9
18	R2	61	2.0	0.312	7.7	LOS A	1.5	37.7	0.59	0.55	32.0
Approach		266	2.0	0.312	7.7	LOS A	1.5	37.7	0.59	0.55	32.7
East: WB Novato Blvd											
1	L2	78	2.0	0.601	12.0	LOS B	4.8	122.3	0.70	0.64	31.3
6	T1	316	2.0	0.601	12.0	LOS B	4.8	122.3	0.70	0.64	31.3
16	R2	202	2.0	0.601	12.0	LOS B	4.8	122.3	0.70	0.64	30.5
Approach		596	2.0	0.601	12.0	LOS B	4.8	122.3	0.70	0.64	31.0
North: SB San Marin Drive											
7	L2	186	2.0	0.473	9.9	LOS A	2.7	67.5	0.64	0.65	31.5
4	T1	242	2.0	0.473	9.9	LOS A	2.7	67.5	0.64	0.65	31.5
14	R2	435	2.0	0.480	10.0	LOS A	2.7	69.4	0.65	0.66	31.4
Approach		863	2.0	0.480	9.9	LOS A	2.7	69.4	0.65	0.65	31.5
West: EB Novato Blvd											
5	L2	94	2.0	0.394	9.4	LOS A	2.0	51.1	0.66	0.66	32.0
2	T1	164	2.0	0.394	9.4	LOS A	2.0	51.1	0.66	0.66	32.0
12	R2	57	2.0	0.394	9.4	LOS A	2.0	51.1	0.66	0.66	31.2
Approach		315	2.0	0.394	9.4	LOS A	2.0	51.1	0.66	0.66	31.9
All Vehicles		2040	2.0	0.601	10.1	LOS B	4.8	122.3	0.66	0.64	31.5

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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LANE SUMMARY

Site: 9 [PM Existing + Project Alt]

Novato Boulevard/San Marin Dr-Sutro Ave
PM Existing + Project Alternative

Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: NB Sutro Ave													
Lane 1[d]	266	2.0	852	0.312	100	7.7	LOS A	1.5	37.7	Full	1600	0.0	0.0
Approach	266	2.0		0.312		7.7	LOS A	1.5	37.7				
East: WB Novato Blvd													
Lane 1[d]	596	2.0	991	0.601	100	12.0	LOS B	4.8	122.3	Full	1600	0.0	0.0
Approach	596	2.0		0.601		12.0	LOS B	4.8	122.3				
North: SB San Marin Drive													
Lane 1	428	2.0	906	0.473	100	9.9	LOS A	2.7	67.5	Full	1600	0.0	0.0
Lane 2[d]	435	2.0	906	0.480	100	10.0	LOS A	2.7	69.4	Short	30	0.0	NA
Approach	863	2.0		0.480		9.9	LOS A	2.7	69.4				
West: EB Novato Blvd													
Lane 1[d]	315	2.0	799	0.394	100	9.4	LOS A	2.0	51.1	Full	1600	0.0	0.0
Approach	315	2.0		0.394		9.4	LOS A	2.0	51.1				
Intersection	2040	2.0		0.601		10.1	LOS B	4.8	122.3				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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Project: N:\AAA\MAX\NOV\126NOV\SIDRA\Novato-San Marin.sip7

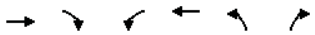
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	156	54	74	300	192	66	129	58	177	230	413
Future Volume (vph)	89	156	54	74	300	192	66	129	58	177	230	413
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.94		1.00	0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1791		1770	1754		1770	1776		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	1791		1770	1754		1770	1776		1770	1863	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	94	164	57	78	316	202	69	136	61	186	242	435
RTOR Reduction (vph)	0	13	0	0	25	0	0	20	0	0	0	308
Lane Group Flow (vph)	94	208	0	78	493	0	69	177	0	186	242	127
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	5.1	23.4		6.2	24.5		6.0	14.6		11.9	20.5	20.5
Effective Green, g (s)	5.1	23.4		6.2	24.5		6.0	14.6		11.9	20.5	20.5
Actuated g/C Ratio	0.07	0.33		0.09	0.35		0.09	0.21		0.17	0.29	0.29
Clearance Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	128	597		156	613		151	369		300	544	462
v/s Ratio Prot	c0.05	0.12		0.04	c0.28		0.04	0.10		c0.11	c0.13	
v/s Ratio Perm												0.08
v/c Ratio	0.73	0.35		0.50	0.80		0.46	0.48		0.62	0.44	0.28
Uniform Delay, d1	31.8	17.6		30.5	20.6		30.5	24.4		27.0	20.2	19.1
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	19.5	0.4		2.5	7.6		2.2	1.0		3.8	0.6	0.3
Delay (s)	51.3	18.0		33.0	28.2		32.7	25.4		30.8	20.8	19.4
Level of Service	D	B		C	C		C	C		C	C	B
Approach Delay (s)		27.9			28.8			27.3			22.2	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	25.7	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	70.1	Sum of lost time (s)	14.0
Intersection Capacity Utilization	66.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
10: Wilson Ave & Novato Blvd #2

11/22/2017



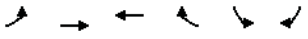
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	524	40	442	802	45	292
Future Volume (vph)	524	40	442	802	45	292
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.9		3.0	3.6	3.6	3.6
Lane Util. Factor	0.95		1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.99		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3533		1787	3610	1805	1593
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3533		1787	3610	1805	1593
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	552	42	465	844	47	307
RTOR Reduction (vph)	5	0	0	0	0	260
Lane Group Flow (vph)	589	0	465	844	47	47
Confl. Peds. (#/hr)		3			6	2
Heavy Vehicles (%)	1%	0%	1%	0%	0%	0%
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases						4
Actuated Green, G (s)	30.9		19.3	38.3	11.1	11.1
Effective Green, g (s)	30.9		19.3	38.3	11.1	11.1
Actuated g/C Ratio	0.43		0.27	0.53	0.15	0.15
Clearance Time (s)	3.9		3.0	3.6	3.6	3.6
Vehicle Extension (s)	3.0		2.0	3.0	2.0	2.0
Lane Grp Cap (vph)	1520		480	1925	279	246
v/s Ratio Prot	c0.17		c0.26	c0.23	0.03	
v/s Ratio Perm						c0.03
v/c Ratio	0.39		0.97	0.44	0.17	0.19
Uniform Delay, d1	14.0		26.0	10.2	26.3	26.4
Progression Factor	1.00		0.91	0.44	1.00	1.00
Incremental Delay, d2	0.7		29.5	0.6	0.1	0.1
Delay (s)	14.7		53.1	5.1	26.4	26.6
Level of Service	B		D	A	C	C
Approach Delay (s)	14.7			22.1	26.6	
Approach LOS	B			C	C	

Intersection Summary				
HCM 2000 Control Delay	20.9	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.56			
Actuated Cycle Length (s)	71.8	Sum of lost time (s)	10.5	
Intersection Capacity Utilization	59.1%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
11: Novato Blvd #2 & Simmons Ln

11/22/2017



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	128	689	975	104	106	281
Future Volume (vph)	128	689	975	104	106	281
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.9	3.6		3.0	3.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	3574	3551		1805	1599
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1805	3574	3551		1805	1599
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	135	725	1026	109	112	296
RTOR Reduction (vph)	0	0	7	0	0	247
Lane Group Flow (vph)	135	725	1128	0	112	49
Confl. Peds. (#/hr)					2	
Confl. Bikes (#/hr)				1		
Heavy Vehicles (%)	0%	1%	0%	0%	0%	1%
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	5	2	6		8	
Permitted Phases						8
Actuated Green, G (s)	12.2	30.9	38.3		11.7	11.7
Effective Green, g (s)	12.2	30.9	38.3		11.7	11.7
Actuated g/C Ratio	0.17	0.43	0.53		0.16	0.16
Clearance Time (s)	3.0	3.9	3.6		3.0	3.0
Vehicle Extension (s)	2.0	3.0	3.0		2.0	2.0
Lane Grp Cap (vph)	306	1538	1894		294	260
v/s Ratio Prot	0.07	c0.20	c0.32		c0.06	
v/s Ratio Perm						0.03
v/c Ratio	0.44	0.47	0.60		0.38	0.19
Uniform Delay, d1	26.7	14.6	11.5		26.8	26.0
Progression Factor	0.69	0.52	1.00		1.00	1.00
Incremental Delay, d2	4.3	1.0	1.4		0.3	0.1
Delay (s)	22.8	8.6	12.8		27.1	26.1
Level of Service	C	A	B		C	C
Approach Delay (s)		10.9	12.8		26.4	
Approach LOS		B	B		C	

Intersection Summary				
HCM 2000 Control Delay	14.4	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.55			
Actuated Cycle Length (s)	71.8	Sum of lost time (s)	10.5	
Intersection Capacity Utilization	54.5%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
12: Grant Ave & Novato Blvd #2

01/23/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	160	636	1	2	876	51	1	6	4	24	1	288
Future Volume (vph)	160	636	1	2	876	51	1	6	4	24	1	288
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.5	4.5	3.5	4.9	4.9		4.0		3.5	3.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00		1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.95	1.00	1.00	0.96		0.98		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00		1.00		0.97	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.95		1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		1.00		0.95	1.00	
Satd. Flow (prot)	1787	1863	1534	1805	3539	1529		1762		1737	1595	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.53		0.75	1.00	
Satd. Flow (perm)	1787	1863	1534	1805	3539	1529		947		1372	1595	
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)	167	662	1	2	912	53	1	6	4	25	1	300
RTOR Reduction (vph)	0	0	0	0	0	18	0	4	0	0	269	0
Lane Group Flow (vph)	167	663	1	2	913	35	0	7	0	25	32	0
Confl. Peds. (#/hr)			11			8	1		14	14		1
Confl. Bikes (#/hr)			1			4			2			
Heavy Vehicles (%)	1%	2%	0%	0%	2%	1%	0%	0%	0%	1%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8			4		
Actuated Green, G (s)	14.6	86.1	86.1	1.2	72.3	72.3		10.7		11.2	11.2	
Effective Green, g (s)	14.6	86.1	86.1	1.2	72.3	72.3		10.7		11.2	11.2	
Actuated g/C Ratio	0.13	0.78	0.78	0.01	0.66	0.66		0.10		0.10	0.10	
Clearance Time (s)	3.5	4.5	4.5	3.5	4.9	4.9		4.0		3.5	3.5	
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0	3.0		2.0		2.0	2.0	
Lane Grp Cap (vph)	237	1458	1200	19	2326	1004		92		139	162	
v/s Ratio Prot	c0.09	c0.36		0.00	0.26						c0.02	
v/s Ratio Perm			0.00			0.02		0.01		0.02		
v/c Ratio	0.70	0.45	0.00	0.11	0.39	0.03		0.08		0.18	0.19	
Uniform Delay, d1	45.6	4.0	2.6	53.9	8.7	6.6		45.2		45.2	45.3	
Progression Factor	1.00	1.00	1.00	1.34	0.22	0.22		1.00		1.00	1.00	
Incremental Delay, d2	7.5	1.0	0.0	0.6	0.4	0.0		0.1		0.2	0.2	
Delay (s)	53.2	5.1	2.6	73.0	2.3	1.5		45.3		45.4	45.5	
Level of Service	D	A	A	E	A	A		D		D	D	
Approach Delay (s)		14.7			2.4			45.3			45.5	
Approach LOS		B			A			D			D	

Intersection Summary				
HCM 2000 Control Delay	14.0	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.48			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.4	
Intersection Capacity Utilization	67.0%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
13: Tamalpais Ave/7th St & Novato Blvd #2

01/23/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	134	555	41	67	784	215	43	119	43	184	110	123
Future Volume (vph)	134	555	41	67	784	215	43	119	43	184	110	123
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.0		3.5	5.0	5.0	3.5	3.5		3.5	3.5	3.5
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.96	1.00	0.99		1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.99	1.00		0.99	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1787	1838		1787	1863	1541	1768	1786		1765	1881	1533
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.62	1.00		0.51	1.00	1.00
Satd. Flow (perm)	1787	1838		1787	1863	1541	1148	1786		939	1881	1533
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)	140	578	43	70	817	224	45	124	45	192	115	128
RTOR Reduction (vph)	0	2	0	0	0	33	0	13	0	0	0	100
Lane Group Flow (vph)	140	619	0	70	817	191	45	156	0	192	115	28
Confl. Peds. (#/hr)			10			6	5		7	7		5
Confl. Bikes (#/hr)						3			2			5
Heavy Vehicles (%)	1%	2%	1%	1%	2%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8			4		4
Actuated Green, G (s)	12.7	66.3		7.5	61.1	61.1	24.2	24.2		24.2	24.2	24.2
Effective Green, g (s)	12.7	66.3		7.5	61.1	61.1	24.2	24.2		24.2	24.2	24.2
Actuated g/C Ratio	0.12	0.60		0.07	0.56	0.56	0.22	0.22		0.22	0.22	0.22
Clearance Time (s)	3.5	5.0		3.5	5.0	5.0	3.5	3.5		3.5	3.5	3.5
Vehicle Extension (s)	2.0	5.0		2.0	5.0	5.0	2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	206	1107		121	1034	855	252	392		206	413	337
v/s Ratio Prot	c0.08	0.34		0.04	c0.44			0.09			0.06	
v/s Ratio Perm						0.12	0.04			c0.20		0.02
v/c Ratio	0.68	0.56		0.58	0.79	0.22	0.18	0.40		0.93	0.28	0.08
Uniform Delay, d1	46.7	13.1		49.7	19.4	12.4	34.8	36.7		42.1	35.6	34.1
Progression Factor	0.89	1.15		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	6.4	1.9		4.1	6.2	0.6	0.1	0.2		43.3	0.1	0.0
Delay (s)	48.2	17.0		53.8	25.5	13.0	35.0	36.9		85.4	35.8	34.1
Level of Service	D	B		D	C	B	C	D		F	D	C
Approach Delay (s)		22.7			24.8			36.5			57.2	
Approach LOS		C			C			D			E	

Intersection Summary				
HCM 2000 Control Delay	30.7	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.81			
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	84.8%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
14: Diablo Ave & Novato Blvd #2

01/23/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	254	22	284	327	625	49	438	238	447	334	12
Future Volume (vph)	24	254	22	284	327	625	49	438	238	447	334	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	11	11	12	11	11	12	12	12	12
Total Lost time (s)		3.7		4.1	4.1	4.1	4.4	4.4	4.4	4.1	4.1	
Lane Util. Factor		0.95		0.91	0.91	1.00	1.00	1.00	1.00	0.91	0.91	
Frpb, ped/bikes		1.00		1.00	1.00	0.95	1.00	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	1.00	
Frt		0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		1.00		0.95	0.99	1.00	0.95	1.00	1.00	0.95	0.98	
Satd. Flow (prot)		3514		1557	3269	1501	1728	1801	1560	1610	3319	
Flt Permitted		1.00		0.95	0.99	1.00	0.95	1.00	1.00	0.95	0.98	
Satd. Flow (perm)		3514		1557	3269	1501	1728	1801	1560	1610	3319	
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)	26	270	23	302	348	665	52	466	253	476	355	13
RTOR Reduction (vph)	0	4	0	0	0	274	0	0	155	0	2	0
Lane Group Flow (vph)	0	315	0	211	439	391	52	466	98	276	566	0
Confl. Peds. (#/hr)			10			15			2			3
Confl. Bikes (#/hr)			1			1						6
Heavy Vehicles (%)	1%	1%	1%	2%	1%	2%	1%	2%	2%	2%	2%	1%
Turn Type	Split	NA		Split	NA	Perm	Split	NA	Perm	Split	NA	
Protected Phases	3	3		4	4		1	1		2	2	
Permitted Phases						4			1		2	
Actuated Green, G (s)		15.9		29.2	29.2	29.2	32.2	32.2	32.2	24.0	24.0	
Effective Green, g (s)		15.9		29.2	29.2	29.2	32.2	32.2	32.2	24.0	24.0	
Actuated g/C Ratio		0.14		0.25	0.25	0.25	0.27	0.27	0.27	0.20	0.20	
Clearance Time (s)		3.7		4.1	4.1	4.1	4.4	4.4	4.4	4.1	4.1	
Vehicle Extension (s)		2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)		475		386	811	372	473	493	427	328	677	
v/s Ratio Prot		c0.09		0.14	0.13		0.03	c0.26		c0.17	0.17	
v/s Ratio Perm						c0.26			0.06			
v/c Ratio		0.66		0.55	0.54	1.05	0.11	0.95	0.23	0.84	0.84	
Uniform Delay, d1		48.3		38.4	38.4	44.2	32.0	41.8	33.1	45.0	44.9	
Progression Factor		1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		2.7		0.9	0.4	60.4	0.0	26.9	0.1	16.8	8.5	
Delay (s)		51.0		39.3	38.8	104.6	32.0	68.7	33.2	61.8	53.4	
Level of Service		D		D	D	F	C	E	C	E	D	
Approach Delay (s)		51.0			72.1			54.6			56.1	
Approach LOS		D			E			D			E	

Intersection Summary				
HCM 2000 Control Delay	61.7	HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio	0.91			
Actuated Cycle Length (s)	117.6	Sum of lost time (s)	16.3	
Intersection Capacity Utilization	85.9%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
14: Diablo Ave & Novato Blvd #2

02/12/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	254	22	284	327	625	49	438	238	447	334	12
Future Volume (vph)	24	254	22	284	327	625	49	438	238	447	334	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	12	11	11	12	10	12	12
Total Lost time (s)	4.0	4.1	4.1	4.0	4.0	4.0	4.0	4.1		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		0.97	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1728	1818	1512	1711	1818	1555	1728	3225		3204	1852	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1728	1818	1512	1711	1818	1555	1728	3225		3204	1852	
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)	26	270	23	302	348	665	52	466	253	476	355	13
RTOR Reduction (vph)	0	0	19	0	0	87	0	65	0	0	1	0
Lane Group Flow (vph)	26	270	4	302	348	578	52	654	0	476	367	0
Confl. Peds. (#/hr)			10			15			2			3
Confl. Bikes (#/hr)			1			1						6
Heavy Vehicles (%)	1%	1%	1%	2%	1%	2%	1%	2%	2%	2%	2%	1%
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	4.8	19.5	19.5	22.1	36.9	54.2	6.4	24.8		17.3	35.8	
Effective Green, g (s)	4.8	19.5	19.5	22.1	36.9	54.2	6.4	24.8		17.3	35.8	
Actuated g/C Ratio	0.05	0.20	0.20	0.22	0.37	0.54	0.06	0.25		0.17	0.36	
Clearance Time (s)	4.0	4.1	4.1	4.0	4.0	4.0	4.0	4.1		4.0	4.0	
Vehicle Extension (s)	3.0	2.0	2.0	3.0	3.0	3.0	3.0	2.0		3.0	3.0	
Lane Grp Cap (vph)	83	354	295	378	671	843	110	800		554	663	
v/s Ratio Prot	0.02	c0.15		c0.18	0.19	0.12	0.03	c0.20		c0.15	0.20	
v/s Ratio Perm			0.00			0.25						
v/c Ratio	0.31	0.76	0.02	0.80	0.52	0.69	0.47	0.82		0.86	0.55	
Uniform Delay, d1	46.0	38.0	32.4	36.8	24.6	16.6	45.1	35.4		40.1	25.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.2	8.5	0.0	11.2	0.7	2.3	3.2	6.2		12.6	1.0	
Delay (s)	48.1	46.5	32.5	48.0	25.3	19.0	48.3	41.6		52.7	26.7	
Level of Service	D	D	C	D	C	B	D	D		D	C	
Approach Delay (s)		45.6			27.3			42.1			41.3	
Approach LOS		D			C			D			D	

Intersection Summary				
HCM 2000 Control Delay	36.2	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.81			
Actuated Cycle Length (s)	99.9	Sum of lost time (s)	16.2	
Intersection Capacity Utilization	79.7%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
15: Redwood Blvd & Diablo Ave/De Long Ave

11/22/2017

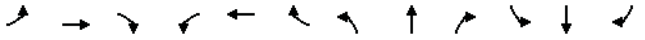
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	284	577	107	107	958	402	138	317	87	332	230	228
Future Volume (vph)	284	577	107	107	958	402	138	317	87	332	230	228
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	9
Total Lost time (s)	4.0	3.7		4.0	4.1		3.5	4.8	4.8	3.5	3.5	3.5
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95	1.00	0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3467	3525		1805	3340		1805	3610	1508	3303	1900	1394
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3467	3525		1805	3340		1805	3610	1508	3303	1900	1394
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	290	589	109	109	978	410	141	323	89	339	235	233
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	33	0	0	50
Lane Group Flow (vph)	290	698	0	109	1388	0	141	323	56	339	235	183
Confl. Peds. (#/hr)						2			7			14
Confl. Bikes (#/hr)												3
Heavy Vehicles (%)	1%	0%	0%	0%	2%	5%	0%	0%	5%	6%	0%	1%
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)	17.1	61.0		17.0	60.5		14.6	22.1	22.1	13.9	22.7	22.7
Effective Green, g (s)	17.1	61.0		17.0	60.5		14.6	22.1	22.1	13.9	22.7	22.7
Actuated g/C Ratio	0.13	0.47		0.13	0.47		0.11	0.17	0.17	0.11	0.17	0.17
Clearance Time (s)	4.0	3.7		4.0	4.1		3.5	4.8	4.8	3.5	3.5	3.5
Vehicle Extension (s)	2.5	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	456	1654		236	1554		202	613	256	353	331	243
v/s Ratio Prot	c0.08	0.20		0.06	c0.42		0.08	0.09		c0.10	0.12	
v/s Ratio Perm									0.04			c0.13
v/c Ratio	0.64	0.42		0.46	0.89		0.70	0.53	0.22	0.96	0.71	0.76
Uniform Delay, d1	53.5	22.8		52.3	31.8		55.6	49.2	46.5	57.8	50.5	51.0
Progression Factor	1.00	1.00		1.44	0.52		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	2.5	0.8		0.3	5.1		8.2	0.4	0.2	37.2	5.6	11.2
Delay (s)	56.0	23.6		75.4	21.7		63.8	49.6	46.7	94.9	56.2	62.2
Level of Service	E	C		E	C		E	D	D	F	E	E
Approach Delay (s)		33.1			25.6			52.7			74.2	
Approach LOS		C			C			D			E	

Intersection Summary			
HCM 2000 Control Delay	41.6	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.4
Intersection Capacity Utilization	96.0%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
16: Reichert Ave & De Long Ave

11/22/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	87	872	18	95	1341	348	12	30	51	247	18	82
Future Volume (vph)	87	872	18	95	1341	348	12	30	51	247	18	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.1		3.0	4.1		3.5	3.5	3.5	3.5	3.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00	0.98	1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00	1.00	0.99	1.00	
Frt	1.00	1.00		1.00	0.97		1.00	1.00	0.85	1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1805	3527		1805	3427		1794	1900	1577	1763	1634	
Flt Permitted	0.95	1.00		0.95	1.00		0.62	1.00	1.00	0.74	1.00	
Satd. Flow (perm)	1805	3527		1805	3427		1172	1900	1577	1366	1634	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	92	918	19	100	1412	366	13	32	54	260	19	86
RTOR Reduction (vph)	0	1	0	0	14	0	0	0	15	0	28	0
Lane Group Flow (vph)	92	936	0	100	1764	0	13	32	39	260	77	0
Confl. Peds. (#/hr)			5			11	5		5	11		5
Confl. Bikes (#/hr)			5			5			5			5
Heavy Vehicles (%)	0%	2%	0%	0%	1%	1%	0%	0%	0%	1%	0%	0%
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	11.0	80.4		10.8	80.2		28.2	28.2	28.2	28.2	28.2	
Effective Green, g (s)	11.0	80.4		10.8	80.2		28.2	28.2	28.2	28.2	28.2	
Actuated g/C Ratio	0.08	0.62		0.08	0.62		0.22	0.22	0.22	0.22	0.22	
Clearance Time (s)	3.0	4.1		3.0	4.1		3.5	3.5	3.5	3.5	3.5	
Vehicle Extension (s)	2.0	3.0		2.0	3.0		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	152	2181		149	2114		254	412	342	296	354	
v/s Ratio Prot	0.05	0.27		c0.06	c0.51			0.02			0.05	
v/s Ratio Perm							0.01		0.02	c0.19		
v/c Ratio	0.61	0.43		0.67	0.83		0.05	0.08	0.11	0.88	0.22	
Uniform Delay, d1	57.4	12.9		57.9	19.7		40.3	40.5	40.9	49.2	41.8	
Progression Factor	0.75	1.15		0.98	0.72		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.8	0.5		7.2	3.3		0.0	0.0	0.1	23.5	0.1	
Delay (s)	46.8	15.3		63.8	17.5		40.3	40.6	40.9	72.8	41.9	
Level of Service	D	B		E	B		D	D	D	E	D	
Approach Delay (s)		18.1			19.9			40.7			63.9	
Approach LOS		B			B			D			E	

Intersection Summary				
HCM 2000 Control Delay	24.8	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.83			
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	10.6	
Intersection Capacity Utilization	86.7%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
17: US 101 SB Ramps & De Long Ave

11/22/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	211	999	27	1732	0	0	0	0	10	7	177
Future Volume (vph)	0	211	999	27	1732	0	0	0	0	10	7	177
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.6	3.6	3.0	3.6					4.0	4.0	
Lane Util. Factor		0.95	1.00	1.00	0.95					0.95	0.95	
Frt		1.00	0.85	1.00	1.00					1.00	0.86	
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (prot)		3574	1599	1770	3539					1681	1515	
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (perm)		3574	1599	1770	3539					1681	1515	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	215	1019	28	1767	0	0	0	0	10	7	181
RTOR Reduction (vph)	0	0	282	0	0	0	0	0	0	0	43	0
Lane Group Flow (vph)	0	215	737	28	1767	0	0	0	0	9	146	0
Heavy Vehicles (%)	0%	1%	1%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type		NA	Perm	Prot	NA					Split	NA	
Protected Phases		6		5	2					4	4	
Permitted Phases			6									
Actuated Green, G (s)		91.3	91.3	10.9	105.2					17.2	17.2	
Effective Green, g (s)		91.3	91.3	10.9	105.2					17.2	17.2	
Actuated g/C Ratio		0.70	0.70	0.08	0.81					0.13	0.13	
Clearance Time (s)		3.6	3.6	3.0	3.6					4.0	4.0	
Vehicle Extension (s)		4.0	4.0	2.0	4.0					2.5	2.5	
Lane Grp Cap (vph)		2510	1122	148	2863					222	200	
v/s Ratio Prot		0.06		0.02	c0.50					0.01	c0.10	
v/s Ratio Perm			c0.46									
v/c Ratio		0.09	0.66	0.19	0.62					0.04	0.73	
Uniform Delay, d1		6.1	10.7	55.4	4.7					49.2	54.2	
Progression Factor		0.78	5.89	0.79	0.48					1.00	1.00	
Incremental Delay, d2		0.1	2.7	0.2	0.7					0.1	12.3	
Delay (s)		4.9	65.7	43.7	3.0					49.3	66.4	
Level of Service		A	E	D	A					D	E	
Approach Delay (s)		55.1			3.6			0.0			65.7	
Approach LOS		E			A			A			E	

Intersection Summary				
HCM 2000 Control Delay	27.1	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.67			
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	10.6	
Intersection Capacity Utilization	127.7%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
18: US 101 NB Ramps & De Long Ave

11/22/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	178	45	0	0	61	28	1684	24	33	0	0	0
Future Volume (vph)	178	45	0	0	61	28	1684	24	33	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.6			3.6		4.5	4.5				
Lane Util. Factor	1.00	0.95			0.95		0.95	0.95				
Frpb, ped/bikes	1.00	1.00			1.00		1.00	1.00				
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00				
Frt	1.00	1.00			0.95		1.00	0.99				
Flt Protected	0.95	1.00			1.00		0.95	0.96				
Satd. Flow (prot)	1770	3610			3353		1698	1695				
Flt Permitted	0.95	1.00			1.00		0.95	0.96				
Satd. Flow (perm)	1770	3610			3353		1698	1695				
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)	185	47	0	0	64	29	1754	25	34	0	0	0
RTOR Reduction (vph)	0	0	0	0	27	0	0	1	0	0	0	0
Lane Group Flow (vph)	185	47	0	0	66	0	912	900	0	0	0	0
Confl. Peds. (#/hr)						1						
Heavy Vehicles (%)	2%	0%	0%	0%	0%	7%	1%	0%	6%	0%	0%	0%
Turn Type	Prot	NA			NA		Split	NA				
Protected Phases	1	6			2		4	4				
Permitted Phases												
Actuated Green, G (s)	15.8	27.6			8.3		94.3	94.3				
Effective Green, g (s)	15.8	27.6			8.3		94.3	94.3				
Actuated g/C Ratio	0.12	0.21			0.06		0.73	0.73				
Clearance Time (s)	3.5	3.6			3.6		4.5	4.5				
Vehicle Extension (s)	2.5	2.0			2.0		3.0	3.0				
Lane Grp Cap (vph)	215	766			214		1231	1229				
v/s Ratio Prot	c0.10	0.01			c0.02		c0.54	0.53				
v/s Ratio Perm												
v/c Ratio	0.86	0.06			0.31		0.74	0.73				
Uniform Delay, d1	56.0	40.9			58.1		10.6	10.5				
Progression Factor	1.13	1.11			1.00		1.00	1.00				
Incremental Delay, d2	27.5	0.0			0.3		4.0	3.9				
Delay (s)	90.6	45.2			58.4		14.6	14.3				
Level of Service	F	D			E		B	B				
Approach Delay (s)		81.4			58.4			14.5			0.0	
Approach LOS		F			E			B			A	

Intersection Summary				
HCM 2000 Control Delay	23.7	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.73			
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	11.6	
Intersection Capacity Utilization	127.7%	ICU Level of Service	H	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
19: Redwood Blvd & Lamont Ave

11/22/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	31	4	23	48	3	57	21	509	60	72	430	15
Future Volume (vph)	31	4	23	48	3	57	21	509	60	72	430	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	3.5		3.5	3.5	3.5	4.8		3.5	4.8	4.8
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes		1.00	1.00		1.00	0.99	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85		1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected		0.96	1.00		0.95	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1818	1615		1814	1595	1805	3545		1805	3610	1615
Flt Permitted		0.80	1.00		0.77	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1511	1615		1462	1595	1805	3545		1805	3610	1615
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	33	4	24	51	3	60	22	536	63	76	453	16
RTOR Reduction (vph)	0	0	18	0	0	46	0	8	0	0	0	8
Lane Group Flow (vph)	0	37	6	0	54	14	22	591	0	76	453	8
Confl. Peds. (#/hr)	1					1			2			
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8		8	4		4						2
Actuated Green, G (s)		12.1	12.1		12.1	12.1	1.0	22.7		5.4	27.1	27.1
Effective Green, g (s)		12.1	12.1		12.1	12.1	1.0	22.7		5.4	27.1	27.1
Actuated g/C Ratio		0.23	0.23		0.23	0.23	0.02	0.44		0.10	0.52	0.52
Clearance Time (s)		3.5	3.5		3.5	3.5	3.5	4.8		3.5	4.8	4.8
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0	3.0		2.0	3.0	3.0
Lane Grp Cap (vph)		351	375		340	371	34	1547		187	1881	841
v/s Ratio Prot							0.01	c0.17		c0.04	0.13	
v/s Ratio Perm		0.02	0.00		c0.04	0.01						0.01
v/c Ratio		0.11	0.01		0.16	0.04	0.65	0.38		0.41	0.24	0.01
Uniform Delay, d1		15.7	15.4		15.9	15.4	25.3	9.9		21.8	6.8	6.0
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		0.0	0.0		0.1	0.0	27.5	0.2		0.5	0.1	0.0
Delay (s)		15.7	15.4		16.0	15.5	52.8	10.1		22.3	6.9	6.0
Level of Service		B	B		B	B	D	B		C	A	A
Approach Delay (s)		15.6			15.7			11.6			9.0	
Approach LOS		B			B			B			A	

Intersection Summary				
HCM 2000 Control Delay	11.1	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.32			
Actuated Cycle Length (s)	52.0	Sum of lost time (s)	11.8	
Intersection Capacity Utilization	46.2%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
20: Redwood Blvd & Landing Ct

11/22/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	3	30	0	27	1	577	27	18	550	1
Future Volume (vph)	0	0	3	30	0	27	1	577	27	18	550	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5		3.5		3.5		4.8	4.8	3.5	4.8	4.8
Lane Util. Factor		1.00		1.00		1.00		0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes		0.99		1.00		1.00		1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes		1.00		1.00		1.00		1.00	1.00	1.00	1.00	1.00
Frt		0.86		1.00		0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected		1.00		0.95		1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1622		1803		1615		3610	1579	1805	3610	1571
Flt Permitted		1.00		0.76		1.00		0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1622		1434		1615		3446	1579	1805	3610	1571
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	3	32	0	28	1	607	28	19	579	1
RTOR Reduction (vph)	0	3	0	0	0	24	0	0	12	0	0	0
Lane Group Flow (vph)	0	0	0	32	0	4	0	608	16	19	579	1
Confl. Peds. (#/hr)			4	4					3			6
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type		NA		Perm		Perm	Perm	NA	Perm	Prot	NA	Perm
Protected Phases		4						2		1	6	
Permitted Phases	4			8		8	2		2			6
Actuated Green, G (s)		7.0		7.0		7.0		27.9	27.9	0.8	32.2	32.2
Effective Green, g (s)		7.0		7.0		7.0		27.9	27.9	0.8	32.2	32.2
Actuated g/C Ratio		0.15		0.15		0.15		0.59	0.59	0.02	0.68	0.68
Clearance Time (s)		3.5		3.5		3.5		4.8	4.8	3.5	4.8	4.8
Vehicle Extension (s)		3.0		2.0		2.0		4.0	4.0	2.0	4.0	4.0
Lane Grp Cap (vph)		239		211		238		2024	927	30	2447	1064
v/s Ratio Prot		0.00								c0.01	0.16	
v/s Ratio Perm				c0.02		0.00		c0.18	0.01			0.00
v/c Ratio		0.00		0.15		0.02		0.30	0.02	0.63	0.24	0.00
Uniform Delay, d1		17.3		17.7		17.3		4.9	4.1	23.2	2.9	2.5
Progression Factor		1.00		1.00		1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.0		0.1		0.0		0.1	0.0	27.8	0.1	0.0
Delay (s)		17.3		17.8		17.3		5.0	4.1	51.0	3.0	2.5
Level of Service		B		B		B		A	A	D	A	A
Approach Delay (s)		17.3			17.6			5.0			4.5	
Approach LOS		B			B			A			A	

Intersection Summary				
HCM 2000 Control Delay	5.4	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.28			
Actuated Cycle Length (s)	47.5	Sum of lost time (s)	11.8	
Intersection Capacity Utilization	42.1%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
21: Novato Blvd #3 & Center Rd/Garden Ct

11/22/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	149	1	199	4	2	2	200	570	5	2	556	97
Future Volume (vph)	149	1	199	4	2	2	200	570	5	2	556	97
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.2	3.2			3.0		3.0	4.4		3.0	4.4	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.85			0.97		1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1616			1791		1805	3604		1805	3483	
Flt Permitted	0.75	1.00			0.90		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1430	1616			1655		1805	3604		1805	3483	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	157	1	209	4	2	2	211	600	5	2	585	102
RTOR Reduction (vph)	0	174	0	0	2	0	0	0	0	0	10	0
Lane Group Flow (vph)	157	36	0	0	6	0	211	605	0	2	677	0
Confl. Peds. (#/hr)									9			6
Confl. Bikes (#/hr)									2			
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4								
Actuated Green, G (s)	16.6	16.6			16.8		16.1	70.6		2.2	56.7	
Effective Green, g (s)	16.6	16.6			16.8		16.1	70.6		2.2	56.7	
Actuated g/C Ratio	0.17	0.17			0.17		0.16	0.71		0.02	0.57	
Clearance Time (s)	3.2	3.2			3.0		3.0	4.4		3.0	4.4	
Vehicle Extension (s)	3.0	3.0			2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	237	268			278		290	2544		39	1974	
v/s Ratio Prot		0.02					c0.12	0.17		0.00	c0.19	
v/s Ratio Perm	c0.11				0.00							
v/c Ratio	0.66	0.13			0.02		0.73	0.24		0.05	0.34	
Uniform Delay, d1	39.1	35.6			34.7		39.9	5.2		47.9	11.6	
Progression Factor	1.00	1.00			1.00		0.96	1.47		1.00	1.00	
Incremental Delay, d2	6.8	0.2			0.0		7.3	0.2		0.2	0.5	
Delay (s)	45.9	35.8			34.8		45.4	7.8		48.1	12.1	
Level of Service	D	D			C		D	A		D	B	
Approach Delay (s)		40.1			34.8			17.5			12.2	
Approach LOS		D			C			B			B	

Intersection Summary				
HCM 2000 Control Delay	20.1	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.47			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.6	
Intersection Capacity Utilization	55.1%	ICU Level of Service	B	
Analysis Period (min)	15			

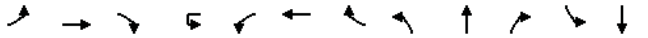
c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
22: Novato Blvd #3 & Arthur Street 11/22/2017

Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	93	124	153	831	7	722	87
Future Volume (vph)	93	124	153	831	7	722	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5	3.5	4.9	3.5	4.9	
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	0.95	
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	1.00	0.98	
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1797	1589	1805	3574	1805	3552	
Flt Permitted	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (perm)	1797	1589	1805	3574	1805	3552	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	98	131	161	875	7	760	92
RTOR Reduction (vph)	0	115	0	0	0	5	0
Lane Group Flow (vph)	98	16	161	875	7	847	0
Confl. Peds. (#/hr)	4	2					
Confl. Bikes (#/hr)		1					
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%	0%
Turn Type	Perm	Perm	Prot	NA	Prot	NA	
Protected Phases			1	6	5	2	
Permitted Phases	4	4					
Actuated Green, G (s)	12.5	12.5	13.5	74.4	1.2	62.1	
Effective Green, g (s)	12.5	12.5	13.5	74.4	1.2	62.1	
Actuated g/C Ratio	0.12	0.12	0.14	0.74	0.01	0.62	
Clearance Time (s)	3.5	3.5	3.5	4.9	3.5	4.9	
Vehicle Extension (s)	2.0	2.0	2.0	4.0	2.0	4.0	
Lane Grp Cap (vph)	224	198	243	2659	21	2205	
v/s Ratio Prot			c0.09	0.24	0.00	c0.24	
v/s Ratio Perm	c0.05	0.01					
v/c Ratio	0.44	0.08	0.66	0.33	0.33	0.38	
Uniform Delay, d1	40.5	38.7	41.1	4.3	49.0	9.4	
Progression Factor	1.00	1.00	0.85	1.43	0.87	0.82	
Incremental Delay, d2	0.5	0.1	3.5	0.2	3.3	0.5	
Delay (s)	41.0	38.7	38.5	6.4	45.9	8.2	
Level of Service	D	D	D	A	D	A	
Approach Delay (s)	39.7			11.4		8.5	
Approach LOS	D			B		A	

Intersection Summary				
HCM 2000 Control Delay	13.3	HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio	0.43			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		11.9
Intersection Capacity Utilization	48.2%	ICU Level of Service		A
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
23: Novato Blvd #3 & Rowland Boulevard 11/22/2017



Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	40	126	15	28	226	196	576	27	352	182	429	380
Future Volume (vph)	40	126	15	28	226	196	576	27	352	182	429	380
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5			3.5	4.1	4.1	3.5	4.1		3.5	4.4
Lane Util. Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00		0.97	1.00
Frpb, ped/bikes	1.00	0.99			1.00	1.00	0.99	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	1.00
Frt	1.00	0.98			1.00	1.00	0.85	1.00	0.95		1.00	0.98
Flt Protected	0.95	1.00			0.95	1.00	1.00	0.95	1.00		0.95	1.00
Satd. Flow (prot)	1805	1860			1789	1900	1592	1805	1774		3502	1851
Flt Permitted	0.95	1.00			0.95	1.00	1.00	0.95	1.00		0.95	1.00
Satd. Flow (perm)	1805	1860			1789	1900	1592	1805	1774		3502	1851
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	42	133	16	29	238	206	606	28	371	192	452	400
RTOR Reduction (vph)	0	5	0	0	0	0	401	0	17	0	0	5
Lane Group Flow (vph)	42	144	0	0	267	206	205	28	546	0	452	461
Confl. Peds. (#/hr)			13				2			5		
Confl. Bikes (#/hr)			1							1		
Heavy Vehicles (%)	0%	0%	0%	0%	1%	0%	0%	0%	1%	1%	0%	0%
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Prot	NA		Prot	NA
Protected Phases	3	8		7	7	4		1	6		5	2
Permitted Phases							4					
Actuated Green, G (s)	6.2	15.5			15.5	24.2	24.2	6.0	37.3		17.1	48.1
Effective Green, g (s)	6.2	15.5			15.5	24.2	24.2	6.0	37.3		17.1	48.1
Actuated g/C Ratio	0.06	0.16			0.16	0.24	0.24	0.06	0.37		0.17	0.48
Clearance Time (s)	3.5	3.5			3.5	4.1	4.1	3.5	4.1		3.5	4.4
Vehicle Extension (s)	2.0	2.0			2.0	2.0	2.0	2.0	3.0		2.0	2.0
Lane Grp Cap (vph)	111	288			277	459	385	108	661		598	890
v/s Ratio Prot	0.02	c0.08			c0.15	0.11		0.02	c0.31		c0.13	0.25
v/s Ratio Perm							c0.13					
v/c Ratio	0.38	0.50			0.96	0.45	0.53	0.26	0.83		0.76	0.52
Uniform Delay, d1	45.0	38.7			42.0	32.2	33.0	44.9	28.4		39.5	17.9
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00		0.69	0.51
Incremental Delay, d2	0.8	0.5			43.7	0.3	0.7	0.5	8.3		8.3	2.1
Delay (s)	45.8	39.2			85.6	32.5	33.7	45.3	36.7		35.6	11.3
Level of Service	D	D			F	C	C	D	D		D	B
Approach Delay (s)		40.7				46.3			37.1			23.2
Approach LOS		D				D			D			C

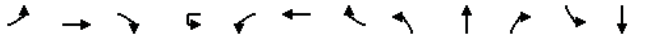
Intersection Summary				
HCM 2000 Control Delay	36.4	HCM 2000 Level of Service		D
HCM 2000 Volume to Capacity ratio	0.79			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		15.5
Intersection Capacity Utilization	83.4%	ICU Level of Service		E
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
23: Novato Blvd #3 & Rowland Boulevard 11/22/2017

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	63
Future Volume (vph)	63
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.95
Adj. Flow (vph)	66
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	6
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	0%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary			

HCM Signalized Intersection Capacity Analysis
24: Rowland Boulevard & Redwood Blvd 11/22/2017



Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	113	631	47	1	135	926	431	23	29	61	396	26
Future Volume (vph)	113	631	47	1	135	926	431	23	29	61	396	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.5	4.5		3.5	4.5		3.5	4.1		3.5	4.8
Lane Util. Factor	1.00	0.95	1.00		1.00	0.95		1.00	0.95		0.97	1.00
Frpb, ped/bikes	1.00	1.00	0.98		1.00	1.00		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	1.00
Frt	1.00	1.00	0.85		1.00	0.95		1.00	0.90		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00		0.95	1.00		0.95	1.00
Satd. Flow (prot)	1805	3574	1590		1805	3422		1805	3211		3502	1900
Flt Permitted	0.95	1.00	1.00		0.95	1.00		0.95	1.00		0.95	1.00
Satd. Flow (perm)	1805	3574	1590		1805	3422		1805	3211		3502	1900
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	119	664	49	1	142	975	454	24	31	64	417	27
RTOR Reduction (vph)	0	0	29	0	0	41	0	0	54	0	0	0
Lane Group Flow (vph)	119	664	20	0	143	1388	0	24	41	0	417	27
Confl. Peds. (#/hr)			4				4			3		
Confl. Bikes (#/hr)										1		
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	Prot	NA		Prot	NA		Prot	NA
Protected Phases	5	2		1	1	6		3	8		7	4
Permitted Phases			2									
Actuated Green, G (s)	11.2	38.2	38.2		12.7	39.7		4.0	13.9		12.8	22.0
Effective Green, g (s)	11.2	38.2	38.2		12.7	39.7		4.0	13.9		12.8	22.0
Actuated g/C Ratio	0.12	0.41	0.41		0.14	0.43		0.04	0.15		0.14	0.24
Clearance Time (s)	3.5	4.5	4.5		3.5	4.5		3.5	4.1		3.5	4.8
Vehicle Extension (s)	2.0	4.0	4.0		2.0	4.0		2.0	2.5		2.5	2.5
Lane Grp Cap (vph)	216	1464	651		245	1457		77	478		480	448
v/s Ratio Prot	0.07	0.19			c0.08	c0.41		0.01	0.01		c0.12	0.01
v/s Ratio Perm			0.01									
v/c Ratio	0.55	0.45	0.03		0.58	0.95		0.31	0.08		0.87	0.06
Uniform Delay, d1	38.6	19.9	16.4		37.8	25.8		43.3	34.2		39.4	27.6
Progression Factor	1.00	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	1.7	0.3	0.0		2.3	13.9		0.8	0.1		15.2	0.0
Delay (s)	40.4	20.2	16.5		40.0	39.8		44.1	34.2		54.5	27.6
Level of Service	D	C	B		D	D		D	C		D	C
Approach Delay (s)		22.9				39.8			36.2			46.5
Approach LOS		C				D			D			D

Intersection Summary			
HCM 2000 Control Delay	36.4	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	93.2	Sum of lost time (s)	16.3
Intersection Capacity Utilization	78.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
24: Rowland Boulevard & Redwood Blvd 11/22/2017

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	144
Future Volume (vph)	144
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.8
Lane Util. Factor	1.00
Frpb, ped/bikes	0.99
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1593
Flt Permitted	1.00
Satd. Flow (perm)	1593
Peak-hour factor, PHF	0.95
Adj. Flow (vph)	152
RTOR Reduction (vph)	116
Lane Group Flow (vph)	36
Confl. Peds. (#/hr)	2
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	0%
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	22.0
Effective Green, g (s)	22.0
Actuated g/C Ratio	0.24
Clearance Time (s)	4.8
Vehicle Extension (s)	2.5
Lane Grp Cap (vph)	376
v/s Ratio Prot	
v/s Ratio Perm	c0.02
v/c Ratio	0.10
Uniform Delay, d1	27.8
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	27.9
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM Signalized Intersection Capacity Analysis
25: Rowland Boulevard & Highway 101 SB Ramps 11/22/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	516	583	737	1297	0	0	0	0	309	6	173
Future Volume (vph)	0	516	583	737	1297	0	0	0	0	309	6	173
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	3.0	4.0					3.0	3.0	
Lane Util. Factor		0.91	0.91	0.97	0.95					0.91	0.91	
Frpb, ped/bikes		1.00	0.99	1.00	1.00					1.00	0.99	
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	
Frt		0.95	0.85	1.00	1.00					1.00	0.92	
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.98	
Satd. Flow (prot)		3254	1450	3502	3610					1643	3062	
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.98	
Satd. Flow (perm)		3254	1450	3502	3610					1643	3062	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	543	614	776	1365	0	0	0	0	325	6	182
RTOR Reduction (vph)	0	56	230	0	0	0	0	0	0	0	15	0
Lane Group Flow (vph)	0	745	126	776	1365	0	0	0	0	179	319	0
Confl. Peds. (#/hr)			2									7
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	33%	0%
Turn Type		NA	Perm	Prot	NA					Split	NA	
Protected Phases		2		1	6					4	4	
Permitted Phases			2									
Actuated Green, G (s)		20.1	20.1	13.5	36.6					13.4	13.4	
Effective Green, g (s)		20.1	20.1	13.5	36.6					13.4	13.4	
Actuated g/C Ratio		0.35	0.35	0.24	0.64					0.24	0.24	
Clearance Time (s)		4.0	4.0	3.0	4.0					3.0	3.0	
Vehicle Extension (s)		4.0	4.0	2.0	2.5					2.0	2.0	
Lane Grp Cap (vph)		1147	511	829	2318					386	719	
v/s Ratio Prot		0.23		c0.22	c0.38					c0.11	0.10	
v/s Ratio Perm			0.09									
v/c Ratio		0.65	0.25	0.94	0.59					0.46	0.44	
Uniform Delay, d1		15.5	13.1	21.3	5.9					18.7	18.6	
Progression Factor		1.00	1.00	1.00	1.00					1.00	1.00	
Incremental Delay, d2		1.4	0.3	17.3	0.3					0.3	0.2	
Delay (s)		16.9	13.4	38.7	6.2					19.0	18.8	
Level of Service		B	B	D	A					B	B	
Approach Delay (s)		15.8			18.0			0.0			18.9	
Approach LOS		B			B			A			B	

Intersection Summary					
HCM 2000 Control Delay	17.4	HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio	0.68				
Actuated Cycle Length (s)	57.0	Sum of lost time (s)		10.0	
Intersection Capacity Utilization	69.5%	ICU Level of Service		C	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL2	EBL	EBT	WBT	WBR	WBR2	NBL2	NBL	NBT	NBR	NEL2	NEL
Lane Configurations												
Traffic Volume (vph)	3	93	740	1215	1	499	793	11	1	778	18	18
Future Volume (vph)	3	93	740	1215	1	499	793	11	1	778	18	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	4.0	4.0		4.0	3.5		3.5	3.0		3.5
Lane Util. Factor		1.00	0.95	0.86		0.86	0.95		0.95	0.88		1.00
Frpb, ped/bikes		1.00	1.00	1.00		1.00	1.00		1.00	1.00		1.00
Flpb, ped/bikes		1.00	1.00	1.00		1.00	1.00		1.00	1.00		1.00
Frt		1.00	1.00	0.99		0.85	1.00		1.00	0.85		0.98
Flt Protected		0.95	1.00	1.00		1.00	0.95		0.95	1.00		0.96
Satd. Flow (prot)		1804	3574	4640		1323	1715		1718	2842		1745
Flt Permitted		0.95	1.00	1.00		1.00	0.95		0.95	1.00		0.96
Satd. Flow (perm)		1804	3574	4640		1323	1715		1718	2842		1745
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	3	98	779	1279	1	525	835	12	1	819	19	19
RTOR Reduction (vph)	0	0	0	7	0	213	0	0	0	0	0	0
Lane Group Flow (vph)	0	101	779	1394	0	191	426	0	422	819	0	43
Confl. Peds. (#/hr)					1					8		
Heavy Vehicles (%)	2%	0%	1%	4%	0%	5%	0%	2%	13%	0%	2%	0%
Turn Type	Prot	Prot	NA	NA		Perm	Split	Split	NA	custom	Perm	Prot
Protected Phases	5	5	2	6			8	8	8	1 8		7
Permitted Phases						6					7	
Actuated Green, G (s)		10.1	49.5	50.8		50.8	36.3		36.3	47.7		8.8
Effective Green, g (s)		10.1	49.5	50.8		50.8	36.3		36.3	47.7		8.8
Actuated g/C Ratio		0.08	0.41	0.42		0.42	0.30		0.30	0.40		0.07
Clearance Time (s)		3.0	4.0	4.0		4.0	3.5		3.5			3.5
Vehicle Extension (s)		2.0	2.0	2.0		2.0	2.0		2.0			2.0
Lane Grp Cap (vph)		151	1474	1964		560	518		519	1129		127
v/s Ratio Prot		0.06	0.22	c0.30			c0.25		0.25	c0.29		
v/s Ratio Perm						0.14						0.02
v/c Ratio		0.67	0.53	0.71		0.34	0.82		0.81	0.73		0.34
Uniform Delay, d1		53.3	26.5	28.5		23.3	38.9		38.7	30.6		52.8
Progression Factor		1.00	1.00	0.90		1.38	1.00		1.00	1.00		1.00
Incremental Delay, d2		8.4	1.4	1.9		1.4	9.7		9.0	2.0		0.6
Delay (s)		61.7	27.8	27.5		33.6	48.6		47.7	32.6		53.4
Level of Service		E	C	C		C	D		D	C		D
Approach Delay (s)			31.7	28.9					40.5			53.4
Approach LOS			C	C					D			D

Intersection Summary			
HCM 2000 Control Delay	34.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	79.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
26: Highway 101 NB Ramps & Rowland Boulevard 11/22/2017

Movement	NER
Lane Configurations	
Traffic Volume (vph)	5
Future Volume (vph)	5
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.95
Adj. Flow (vph)	5
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	15%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM Signalized Intersection Capacity Analysis
27: Rowland Boulevard & Rowland Way 11/22/2017

Movement	EBU	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Volume (vph)	6	225	1289	1372	26	36	339
Future Volume (vph)	6	225	1289	1372	26	36	339
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	4.0	4.0		3.2	3.2
Lane Util. Factor		0.97	0.91	0.95		1.00	0.95
Frpb, ped/bikes		1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00		1.00	1.00
Frt		1.00	1.00	1.00		0.88	0.85
Flt Protected		0.95	1.00	1.00		0.99	1.00
Satd. Flow (prot)		3468	5187	3593		1634	1519
Flt Permitted		0.95	1.00	1.00		0.99	1.00
Satd. Flow (perm)		3468	5187	3593		1634	1519
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	6	232	1329	1414	27	37	349
RTOR Reduction (vph)	0	0	0	1	0	140	171
Lane Group Flow (vph)	0	238	1329	1440	0	54	21
Confl. Peds. (#/hr)					12	2	
Heavy Vehicles (%)	0%	1%	0%	0%	7%	2%	1%
Turn Type	Prot	Prot	NA	NA		Prot	Perm
Protected Phases	5	5	2	6		4	
Permitted Phases							4
Actuated Green, G (s)		12.8	99.8	83.5		13.0	13.0
Effective Green, g (s)		12.8	99.8	83.5		13.0	13.0
Actuated g/C Ratio		0.11	0.83	0.70		0.11	0.11
Clearance Time (s)		3.5	4.0	4.0		3.2	3.2
Vehicle Extension (s)		2.0	4.0	4.0		2.0	2.0
Lane Grp Cap (vph)		369	4313	2500		177	164
v/s Ratio Prot		c0.07	0.26	c0.40		c0.03	
v/s Ratio Perm							0.01
v/c Ratio		0.64	0.31	0.58		0.31	0.13
Uniform Delay, d1		51.4	2.3	9.3		49.3	48.4
Progression Factor		1.02	1.20	0.99		1.00	1.00
Incremental Delay, d2		2.4	0.2	0.9		0.4	0.1
Delay (s)		54.7	2.9	10.0		49.7	48.5
Level of Service		D	A	A		D	D
Approach Delay (s)			10.8	10.0		49.1	
Approach LOS			B	A		D	

Intersection Summary				
HCM 2000 Control Delay	14.8	HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio	0.55			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)		10.7
Intersection Capacity Utilization	71.1%	ICU Level of Service		C
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
28: Rowland Boulevard & Vintage Way 11/22/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	489	811	2	576	6	822	3	2	4	3	0
Future Volume (vph)	17	489	811	2	576	6	822	3	2	4	3	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0	4.0	3.0	4.0		3.6	3.6			3.2	
Lane Util. Factor	1.00	0.95	0.88	1.00	0.95		0.97	1.00			1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	0.99			1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.94			1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00			0.97	
Satd. Flow (prot)	1805	3539	2842	1805	3567		3502	1768			1847	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00			0.97	
Satd. Flow (perm)	1805	3539	2842	1805	3567		3502	1768			1847	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	18	515	854	2	606	6	865	3	2	4	3	0
RTOR Reduction (vph)	0	0	0	0	1	0	0	1	0	0	0	0
Lane Group Flow (vph)	18	515	854	2	611	0	865	4	0	0	7	0
Confl. Peds. (#/hr)			9	9		13			11			
Confl. Bikes (#/hr)			2			2						
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Prot	NA	pt+ov	Prot	NA		Split	NA		Split	NA	
Protected Phases	5	2	2 3	1	6		3	3		4	4	
Permitted Phases												
Actuated Green, G (s)	5.4	49.6	105.0	2.8	47.0		51.4	51.4			2.4	
Effective Green, g (s)	5.4	49.6	105.0	2.8	47.0		51.4	51.4			2.4	
Actuated g/C Ratio	0.05	0.41	0.88	0.02	0.39		0.43	0.43			0.02	
Clearance Time (s)	3.0	4.0		3.0	4.0		3.6	3.6			3.2	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		3.0	3.0			2.0	
Lane Grp Cap (vph)	81	1462	2486	42	1397		1500	757			36	
v/s Ratio Prot	0.01	0.15	c0.30	0.00	c0.17		c0.25	0.00			c0.00	
v/s Ratio Perm												
v/c Ratio	0.22	0.35	0.34	0.05	0.44		0.58	0.01			0.19	
Uniform Delay, d1	55.3	24.2	1.3	57.3	26.8		26.0	19.7			57.8	
Progression Factor	1.20	1.20	0.93	1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.5	0.6	0.4	0.2	1.0		1.6	0.0			1.0	
Delay (s)	66.6	29.7	1.6	57.5	27.8		27.7	19.7			58.8	
Level of Service	E	C	A	E	C		C	B			E	
Approach Delay (s)		12.9			27.9			27.6			58.8	
Approach LOS		B			C			C			E	

Intersection Summary				
HCM 2000 Control Delay	20.6	HCM 2000 Level of Service		C
HCM 2000 Volume to Capacity ratio	0.50			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)		13.8
Intersection Capacity Utilization	60.1%	ICU Level of Service		B
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
29: Novato Blvd #3 & Sunset Parkway

11/22/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	206	18	33	30	11	36	44	285	51	34	321	217
Future Volume (vph)	206	18	33	30	11	36	44	285	51	34	321	217
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.0		3.5	3.5		3.5	4.9		3.5	4.6	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.98		1.00	0.98		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.90		1.00	0.89		1.00	0.98		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	1674		1805	1642		1805	1834		1805	1778	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1787	1674		1805	1642		1805	1834		1805	1778	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	217	19	35	32	12	38	46	300	54	36	338	228
RTOR Reduction (vph)	0	27	0	0	34	0	0	5	0	0	19	0
Lane Group Flow (vph)	217	27	0	32	16	0	46	349	0	36	547	0
Confl. Peds. (#/hr)			11			6			3			
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	1%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases												
Actuated Green, G (s)	12.9	17.8		3.4	8.8		5.2	38.5		5.2	38.8	
Effective Green, g (s)	12.9	17.8		3.4	8.8		5.2	38.5		5.2	38.8	
Actuated g/C Ratio	0.16	0.22		0.04	0.11		0.06	0.48		0.06	0.48	
Clearance Time (s)	3.5	4.0		3.5	3.5		3.5	4.9		3.5	4.6	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	285	368		75	178		116	873		116	853	
v/s Ratio Prot	c0.12	0.02		0.02	c0.01		c0.03	0.19		0.02	c0.31	
v/s Ratio Perm												
v/c Ratio	0.76	0.07		0.43	0.09		0.40	0.40		0.31	0.64	
Uniform Delay, d1	32.5	25.0		37.7	32.4		36.3	13.7		36.1	15.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	10.3	0.0		1.4	0.1		0.8	1.4		0.6	3.7	
Delay (s)	42.8	25.0		39.2	32.5		37.1	15.0		36.6	19.5	
Level of Service	D	C		D	C		D	B		D	B	
Approach Delay (s)		39.2			35.1			17.6			20.5	
Approach LOS		D			D			B			C	

Intersection Summary				
HCM 2000 Control Delay	24.3	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.58			
Actuated Cycle Length (s)	80.8	Sum of lost time (s)	15.9	
Intersection Capacity Utilization	63.2%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM 2010 AWSC
30: Redwood Blvd & Novato Blvd #3

11/22/2017

Intersection	
Intersection Delay, s/veh	40.2
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	44	263	67	72	357	109	111	13	139	84	10	46
Future Vol, veh/h	44	263	67	72	357	109	111	13	139	84	10	46
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	1	2	1	1	2	1	1	1	1	1	1	1
Mvmt Flow	46	277	71	76	376	115	117	14	146	88	11	48
Number of Lanes	1	1	0	1	1	0	1	1	1	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	3	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	2	2	2
HCM Control Delay	30.2	66.2	15.1	14.4
HCM LOS	D	F	C	B

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	100%	0%	0%	80%	0%	77%	0%	18%
Vol Right, %	0%	0%	100%	0%	20%	0%	23%	0%	82%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	111	13	139	44	330	72	466	84	56
LT Vol	111	0	0	44	0	72	0	84	0
Through Vol	0	13	0	0	263	0	357	0	10
RT Vol	0	0	139	0	67	0	109	0	46
Lane Flow Rate	117	14	146	46	347	76	491	88	59
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.296	0.033	0.325	0.111	0.767	0.172	1.022	0.234	0.138
Departure Headway (Hd)	9.344	8.826	8.101	8.594	7.954	8.16	7.5	9.83	8.706
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	387	408	446	415	452	438	481	368	414
Service Time	7.044	6.526	5.801	6.383	5.743	5.938	5.279	7.53	6.406
HCM Lane V/C Ratio	0.302	0.034	0.327	0.111	0.768	0.174	1.021	0.239	0.143
HCM Control Delay	15.9	11.8	14.7	12.5	32.6	12.6	74.5	15.5	12.8
HCM Lane LOS	C	B	B	B	D	B	F	C	B
HCM 95th-tile Q	1.2	0.1	1.4	0.4	6.6	0.6	14.2	0.9	0.5

MOVEMENT SUMMARY

Site: 30 [PM Existing + Project Alt]

Novato Boulevard/Redwood Boulevard
PM Existing + Project Alternative

Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NB Redwood Boulevard											
3	L2	117	2.0	0.314	7.5	LOS A	1.5	38.5	0.58	0.52	32.6
8	T1	14	2.0	0.314	7.5	LOS A	1.5	38.5	0.58	0.52	32.5
18	R2	146	2.0	0.314	7.5	LOS A	1.5	38.5	0.58	0.52	31.7
Approach		277	2.0	0.314	7.5	LOS A	1.5	38.5	0.58	0.52	32.1
East: WB Novato Blvd											
1	L2	76	2.0	0.503	8.9	LOS A	3.4	86.8	0.51	0.36	32.6
6	T1	376	2.0	0.503	8.9	LOS A	3.4	86.8	0.51	0.36	32.6
16	R2	115	2.0	0.503	8.9	LOS A	3.4	86.8	0.51	0.36	31.8
Approach		566	2.0	0.503	8.9	LOS A	3.4	86.8	0.51	0.36	32.5
North: SB Redwood Boulevard											
7	L2	88	2.0	0.197	7.0	LOS A	0.8	21.0	0.60	0.57	32.4
4	T1	11	2.0	0.197	7.0	LOS A	0.8	21.0	0.60	0.57	32.4
14	R2	48	2.0	0.197	7.0	LOS A	0.8	21.0	0.60	0.57	31.6
Approach		147	2.0	0.197	7.0	LOS A	0.8	21.0	0.60	0.57	32.1
West: EB Novato Blvd											
5	L2	46	2.0	0.273	5.5	LOS A	1.3	33.3	0.36	0.23	34.3
2	T1	277	2.0	0.273	5.5	LOS A	1.3	33.3	0.36	0.23	34.3
12	R2	71	2.0	0.060	3.5	LOS A	0.2	5.9	0.29	0.16	34.5
Approach		394	2.0	0.273	5.2	LOS A	1.3	33.3	0.34	0.22	34.3
All Vehicles		1384	2.0	0.503	7.4	LOS A	3.4	86.8	0.49	0.37	32.9

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

Site: 30 [PM Existing + Project Alt]

Novato Boulevard/Redwood Boulevard
PM Existing + Project Alternative

Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: NB Redwood Boulevard													
Lane 1[d]	277	2.0	882	0.314	100	7.5	LOS A	1.5	38.5	Full	1600	0.0	0.0
Approach	277	2.0		0.314		7.5	LOS A	1.5	38.5				
East: WB Novato Blvd													
Lane 1[d]	566	2.0	1126	0.503	100	8.9	LOS A	3.4	86.8	Full	1600	0.0	0.0
Approach	566	2.0		0.503		8.9	LOS A	3.4	86.8				
North: SB Redwood Boulevard													
Lane 1[d]	147	2.0	749	0.197	100	7.0	LOS A	0.8	21.0	Full	1600	0.0	0.0
Approach	147	2.0		0.197		7.0	LOS A	0.8	21.0				
West: EB Novato Blvd													
Lane 1[d]	323	2.0	1184	0.273	100	5.5	LOS A	1.3	33.3	Full	1600	0.0	0.0
Lane 2	71	2.0	1184	0.060	100	3.5	LOS A	0.2	5.9	Short	30	0.0	NA
Approach	394	2.0		0.273		5.2	LOS A	1.3	33.3				
Intersection	1384	2.0		0.503		7.4	LOS A	3.4	86.8				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

HCM Signalized Intersection Capacity Analysis
30: Redwood Blvd & Novato Blvd #3 06/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	263	67	72	357	109	111	13	139	84	10	46
Future Volume (vph)	44	263	67	72	357	109	111	13	139	84	10	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	16	12	16	16	12	12	12	12	12	12
Total Lost time (s)	3.5	4.0		3.5	4.0		3.5	4.0	4.0	3.5	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	0.96		1.00	1.00	0.85	1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1787	2051		1787	2042		1787	1881	1599	1787	1652	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1787	2051		1787	2042		1787	1881	1599	1787	1652	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	46	277	71	76	376	115	117	14	146	88	11	48
RTOR Reduction (vph)	0	9	0	0	11	0	0	0	123	0	43	0
Lane Group Flow (vph)	46	339	0	76	480	0	117	14	23	88	16	0
Heavy Vehicles (%)	1%	2%	1%	1%	2%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	3.0	20.3		4.1	21.4		9.7	8.5	8.5	6.3	5.1	
Effective Green, g (s)	3.0	20.3		4.1	21.4		9.7	8.5	8.5	6.3	5.1	
Actuated g/C Ratio	0.06	0.37		0.08	0.39		0.18	0.16	0.16	0.12	0.09	
Clearance Time (s)	3.5	4.0		3.5	4.0		3.5	4.0	4.0	3.5	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	98	768		135	806		319	294	250	207	155	
v/s Ratio Prot	0.03	0.17		c0.04	c0.23		c0.07	0.01		0.05	0.01	
v/s Ratio Perm									c0.01			
v/c Ratio	0.47	0.44		0.56	0.59		0.37	0.05	0.09	0.43	0.10	
Uniform Delay, d1	24.8	12.7		24.2	13.0		19.6	19.4	19.5	22.3	22.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.5	0.4		5.3	1.2		0.7	0.1	0.2	1.4	0.3	
Delay (s)	28.4	13.1		29.5	14.2		20.3	19.5	19.7	23.7	22.7	
Level of Service	C	B		C	B		C	B	B	C	C	
Approach Delay (s)		14.9			16.2			19.9			23.3	
Approach LOS		B			B			B			C	

Intersection Summary				
HCM 2000 Control Delay	17.3	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.47			
Actuated Cycle Length (s)	54.2	Sum of lost time (s)	15.0	
Intersection Capacity Utilization	51.6%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
31: Alameda Del Prado & Ignacio Blvd 02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	445	78	332	727	34	98	4	162	28	5	1
Future Volume (vph)	10	445	78	332	727	34	98	4	162	28	5	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.6	3.6	3.0	3.6			3.5	3.5		3.7	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00			1.00	0.98		1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00			0.99	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	0.99			1.00	0.85		1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00		0.96	
Satd. Flow (prot)	1770	3610	1573	1900	3586			1784	1589		1812	
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.76	1.00		0.76	
Satd. Flow (perm)	1770	3610	1573	1805	3586			1421	1589		1431	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	11	468	82	349	765	36	103	4	171	29	5	1
RTOR Reduction (vph)	0	0	30	0	2	0	0	0	146	0	1	0
Lane Group Flow (vph)	11	468	52	349	799	0	0	107	25	0	34	0
Confl. Peds. (#/hr)			4				7		4	4		7
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2				8		8	4		
Actuated Green, G (s)	1.2	47.6	47.6	27.4	73.8			14.9	14.9		14.7	
Effective Green, g (s)	1.2	47.6	47.6	27.4	73.8			14.9	14.9		14.7	
Actuated g/C Ratio	0.01	0.48	0.48	0.27	0.74			0.15	0.15		0.15	
Clearance Time (s)	3.0	3.6	3.6	3.0	3.6			3.5	3.5		3.7	
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0			2.0	2.0		2.0	
Lane Grp Cap (vph)	21	1718	748	520	2646			211	236		210	
v/s Ratio Prot	c0.01	0.13		c0.18	c0.22							
v/s Ratio Perm			0.03					c0.08	0.02		0.02	
v/c Ratio	0.52	0.27	0.07	0.67	0.30			0.51	0.11		0.16	
Uniform Delay, d1	49.1	15.8	14.2	32.3	4.4			39.2	36.8		37.3	
Progression Factor	1.00	1.00	1.00	0.74	0.77			1.00	1.00		1.00	
Incremental Delay, d2	10.4	0.4	0.2	2.4	0.3			0.7	0.1		0.1	
Delay (s)	59.5	16.2	14.4	26.2	3.7			39.9	36.9		37.4	
Level of Service	E	B	B	C	A			D	D		D	
Approach Delay (s)		16.8			10.5			38.0			37.4	
Approach LOS		B			B			D			D	

Intersection Summary				
HCM 2000 Control Delay	16.5	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.45			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.3	
Intersection Capacity Utilization	68.1%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
32: US 101 SB Off Ramp/Enfrente Rd & Ignacio Blvd/Ignacio Blvd #3 02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	392	264	586	808	139	0	0	742	189	89	296
Future Volume (vph)	33	392	264	586	808	139	0	0	742	189	89	296
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			2%			0%	
Total Lost time (s)	3.0	8.0	8.0	4.0	5.0				4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95				0.88		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.96	1.00	0.99				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	1.00	0.85	1.00	0.98				0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00				1.00		0.97	1.00
Satd. Flow (prot)	1805	3610	1550	1787	3503				2814		1809	1578
Flt Permitted	0.95	1.00	1.00	0.95	1.00				1.00		0.97	1.00
Satd. Flow (perm)	1805	3610	1550	1787	3503				2814		1809	1578
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)	34	408	275	610	842	145	0	0	773	197	93	308
RTOR Reduction (vph)	0	0	201	0	10	0	0	0	410	0	0	241
Lane Group Flow (vph)	34	408	74	610	977	0	0	0	363	0	290	67
Confl. Peds. (#/hr)			7			20						1
Confl. Bikes (#/hr)						3						
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	5%	1%
Turn Type	Prot	NA	Perm	Prot	NA				Over	Split	NA	Perm
Protected Phases	5	2		1	6				1	7	7	
Permitted Phases			2									7
Actuated Green, G (s)	6.6	26.9	26.9	35.2	59.5				35.2		21.9	21.9
Effective Green, g (s)	6.6	26.9	26.9	35.2	59.5				35.2		21.9	21.9
Actuated g/C Ratio	0.07	0.27	0.27	0.35	0.60				0.35		0.22	0.22
Clearance Time (s)	3.0	8.0	8.0	4.0	5.0				4.0		4.0	4.0
Vehicle Extension (s)	2.0	2.5	2.5	3.0	4.0				3.0		2.5	2.5
Lane Grp Cap (vph)	119	971	416	629	2084				990		396	345
v/s Ratio Prot	0.02	c0.11		c0.34	c0.28				0.13		c0.16	
v/s Ratio Perm			0.05									0.04
v/c Ratio	0.29	0.42	0.18	0.97	0.47				0.37		0.73	0.20
Uniform Delay, d1	44.5	30.1	28.1	31.9	11.4				24.1		36.3	31.9
Progression Factor	0.98	0.68	0.40	0.80	0.78				1.00		1.00	1.00
Incremental Delay, d2	0.5	1.3	0.9	20.5	0.5				0.2		6.5	0.2
Delay (s)	44.0	21.9	12.3	45.9	9.3				24.3		42.8	32.1
Level of Service	D	C	B	D	A				C		D	C
Approach Delay (s)		19.2			23.3			24.3			37.3	
Approach LOS		B			C			C			D	

Intersection Summary				
HCM 2000 Control Delay	25.0	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.76			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	78.4%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
33: Nave Dr & Ignacio Blvd #3/Bel Marin Keys Blvd #3 02/15/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	316	1013	118	651	564	868	749	252	0	0	0
Future Volume (vph)	0	316	1013	118	651	564	868	749	252	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.6	3.0	4.0		4.6	4.6	3.0			
Lane Util. Factor		0.95	1.00	1.00	0.95		0.91	0.91	1.00			
Frpb, ped/bikes		1.00	0.99	1.00	0.99		1.00	1.00	0.99			
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00			
Frt		1.00	0.85	1.00	0.93		1.00	1.00	0.85			
Flt Protected		1.00	1.00	0.95	1.00		0.95	0.98	1.00			
Satd. Flow (prot)		3610	1605	1805	3307		1643	3382	1600			
Flt Permitted		1.00	1.00	0.95	1.00		0.95	0.98	1.00			
Satd. Flow (perm)		3610	1605	1805	3307		1643	3382	1600			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	333	1066	124	685	594	914	788	265	0	0	0
RTOR Reduction (vph)	0	0	83	0	42	0	0	0	126	0	0	0
Lane Group Flow (vph)	0	333	983	124	1237	0	558	1144	139	0	0	0
Confl. Peds. (#/hr)			1			1			1			
Heavy Vehicles (%)	0%	0%	0%	0%	0%	2%	0%	1%	0%	0%	0%	0%
Turn Type		NA	pm+ov	Prot	NA		Split	NA	pm+ov			
Protected Phases		2	3	1	6		3	3	1			
Permitted Phases			2						3			
Actuated Green, G (s)		36.0	75.8	12.6	51.6		39.8	39.8	52.4			
Effective Green, g (s)		36.0	75.8	12.6	51.6		39.8	39.8	52.4			
Actuated g/C Ratio		0.36	0.76	0.13	0.52		0.40	0.40	0.52			
Clearance Time (s)		4.0	4.6	3.0	4.0		4.6	4.6	3.0			
Vehicle Extension (s)		4.0	2.0	2.0	4.0		2.0	2.0	2.0			
Lane Grp Cap (vph)		1299	1216	227	1706		653	1346	838			
v/s Ratio Prot		0.09	c0.32	0.07	c0.37		c0.34	0.34	0.02			
v/s Ratio Perm			0.29						0.07			
v/c Ratio		0.26	0.81	0.55	0.73		0.85	0.85	0.17			
Uniform Delay, d1		22.6	7.6	41.0	18.7		27.5	27.4	12.4			
Progression Factor		1.09	1.09	1.00	1.00		1.00	1.00	1.00			
Incremental Delay, d2		0.4	3.4	1.4	2.7		10.2	5.0	0.0			
Delay (s)		24.9	11.6	42.5	21.4		37.7	32.4	12.4			
Level of Service		C	B	D	C		D	C	B			
Approach Delay (s)		14.8			23.3			31.2			0.0	
Approach LOS		B			C			C			A	

Intersection Summary				
HCM 2000 Control Delay	24.1	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.82			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.6	
Intersection Capacity Utilization	80.0%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
34: Bel Marin Keys Blvd #3 & Commercial Blvd

11/22/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	0	38	278	1	28	46	476	78	31	1121	7
Future Volume (vph)	3	0	38	278	1	28	46	476	78	31	1121	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	3.0	3.9		3.0	3.5	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			1.00	0.99	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.87			1.00	0.85	1.00	0.98		1.00	1.00	
Flt Protected		1.00			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1632			1807	1396	1805	3521		1805	3571	
Flt Permitted		0.98			0.69	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1607			1316	1396	1805	3521		1805	3571	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	3	0	42	309	1	31	51	529	87	34	1246	8
RTOR Reduction (vph)	0	32	0	0	0	22	0	14	0	0	0	0
Lane Group Flow (vph)	0	13	0	0	310	9	51	602	0	34	1254	0
Confl. Peds. (#/hr)	3		2	2		3			3			
Heavy Vehicles (%)	2%	0%	0%	0%	0%	14%	0%	0%	0%	0%	1%	0%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		22.1			22.1	22.1	4.2	38.4		3.6	38.2	
Effective Green, g (s)		22.1			22.1	22.1	4.2	38.4		3.6	38.2	
Actuated g/C Ratio		0.29			0.29	0.29	0.06	0.51		0.05	0.51	
Clearance Time (s)		4.0			4.0	4.0	3.0	3.9		3.0	3.5	
Vehicle Extension (s)		3.0			3.0	3.0	2.5	3.0		2.5	4.0	
Lane Grp Cap (vph)		473			387	411	101	1802		86	1818	
v/s Ratio Prot							c0.03	0.17		0.02	c0.35	
v/s Ratio Perm		0.01			c0.24	0.01						
v/c Ratio		0.03			0.80	0.02	0.50	0.33		0.40	0.69	
Uniform Delay, d1		18.8			24.4	18.8	34.4	10.8		34.6	13.9	
Progression Factor		1.00			1.00	1.00	1.00	1.00		0.89	0.77	
Incremental Delay, d2		0.0			11.3	0.0	2.9	0.5		1.8	1.8	
Delay (s)		18.8			35.7	18.8	37.3	11.3		32.7	12.5	
Level of Service		B			D	B	D	B		C	B	
Approach Delay (s)		18.8			34.2			13.3			13.0	
Approach LOS		B			C			B			B	

Intersection Summary				
HCM 2000 Control Delay	16.3	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	10.9	
Intersection Capacity Utilization	67.1%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
35: Bel Marin Keys Blvd #3 & Hamilton Dr/Digital Dr

11/22/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	7	154	482	4	13	45	344	102	6	529	2
Future Volume (vph)	5	7	154	482	4	13	45	344	102	6	529	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	3.5	3.5	3.5		3.0	4.0		3.0	4.0	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.99	1.00	0.99		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	0.85	1.00	0.88		1.00	0.97		1.00	1.00	
Flt Protected		0.98	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1864	1533	1804	1662		1770	3468		1805	3572	
Flt Permitted		0.96	1.00	0.75	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1821	1533	1422	1662		1770	3468		1805	3572	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	8	167	524	4	14	49	374	111	7	575	2
RTOR Reduction (vph)	0	0	102	0	9	0	0	31	0	0	0	0
Lane Group Flow (vph)	0	13	65	524	9	0	49	454	0	7	577	0
Confl. Peds. (#/hr)	1		1	1		1			2			8
Heavy Vehicles (%)	0%	0%	4%	0%	0%	0%	2%	0%	0%	0%	1%	0%
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8								
Actuated Green, G (s)		29.4	29.4	29.4	29.4		5.4	33.3		1.8	29.7	
Effective Green, g (s)		29.4	29.4	29.4	29.4		5.4	33.3		1.8	29.7	
Actuated g/C Ratio		0.39	0.39	0.39	0.39		0.07	0.44		0.02	0.40	
Clearance Time (s)		3.5	3.5	3.5	3.5		3.0	4.0		3.0	4.0	
Vehicle Extension (s)		2.0	2.0	2.5	2.5		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)		713	600	557	651		127	1539		43	1414	
v/s Ratio Prot					0.01		c0.03	0.13		0.00	c0.16	
v/s Ratio Perm		0.01	0.04	c0.37								
v/c Ratio		0.02	0.11	0.94	0.01		0.39	0.29		0.16	0.41	
Uniform Delay, d1		14.0	14.5	22.0	13.9		33.2	13.3		35.9	16.3	
Progression Factor		1.00	1.00	1.00	1.00		1.37	0.45		1.00	1.00	
Incremental Delay, d2		0.0	0.0	24.3	0.0		0.7	0.5		0.7	0.9	
Delay (s)		14.0	14.5	46.2	13.9		46.1	6.5		36.5	17.2	
Level of Service		B	B	D	B		D	A		D	B	
Approach Delay (s)		14.5			45.2			10.1			17.4	
Approach LOS		B			D			B			B	

Intersection Summary				
HCM 2000 Control Delay	23.2	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.65			
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	10.5	
Intersection Capacity Utilization	71.7%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
36: Nave Dr & US 101 NB Off Ramp

11/22/2017

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	704	233	0	1174	878	238
Future Volume (vph)	704	233	0	1174	878	238
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		5.0	5.0	
Lane Util. Factor	0.97	1.00		0.95	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	0.97	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3467	1563		3574	3467	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3467	1563		3574	3467	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	718	238	0	1198	896	243
RTOR Reduction (vph)	0	41	0	0	35	0
Lane Group Flow (vph)	718	197	0	1198	1104	0
Confl. Peds. (#/hr)		1				
Heavy Vehicles (%)	1%	2%	0%	1%	1%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	31.0	31.0		31.0	31.0	
Effective Green, g (s)	31.0	31.0		31.0	31.0	
Actuated g/C Ratio	0.44	0.44		0.44	0.44	
Clearance Time (s)	3.0	3.0		5.0	5.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	1535	692		1582	1535	
v/s Ratio Prot	c0.21			c0.34	0.32	
v/s Ratio Perm		0.13				
v/c Ratio	0.47	0.29		0.76	0.72	
Uniform Delay, d1	13.7	12.4		16.3	15.9	
Progression Factor	1.00	1.00		0.49	1.00	
Incremental Delay, d2	1.0	1.0		2.6	2.9	
Delay (s)	14.7	13.5		10.6	18.9	
Level of Service	B	B		B	B	
Approach Delay (s)	14.4			10.6	18.9	
Approach LOS	B			B	B	

Intersection Summary				
HCM 2000 Control Delay	14.6	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.61			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	62.5%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
37: Nave Dr & Hamilton Center

11/22/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	114	43	898	127	140	770
Future Volume (vph)	114	43	898	127	140	770
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.2	3.2	4.4		3.0	4.4
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.98		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	1615	1863		1770	1881
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1805	1615	1863		1770	1881
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	119	45	935	132	146	802
RTOR Reduction (vph)	0	41	6	0	0	0
Lane Group Flow (vph)	119	4	1061	0	146	802
Confl. Peds. (#/hr)				2		
Heavy Vehicles (%)	0%	0%	0%	0%	2%	1%
Turn Type	Prot	Perm	NA		Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8				
Actuated Green, G (s)	6.4	6.4	45.0		8.0	56.0
Effective Green, g (s)	6.4	6.4	45.0		8.0	56.0
Actuated g/C Ratio	0.09	0.09	0.64		0.11	0.80
Clearance Time (s)	3.2	3.2	4.4		3.0	4.4
Vehicle Extension (s)	1.0	1.0	1.0		1.0	1.0
Lane Grp Cap (vph)	165	147	1197		202	1504
v/s Ratio Prot	c0.07		c0.57		c0.08	0.43
v/s Ratio Perm		0.00				
v/c Ratio	0.72	0.03	0.89		0.72	0.53
Uniform Delay, d1	30.9	29.0	10.4		29.9	2.4
Progression Factor	1.00	1.00	0.79		1.07	0.87
Incremental Delay, d2	12.3	0.0	8.4		8.0	1.0
Delay (s)	43.3	29.0	16.6		39.9	3.2
Level of Service	D	C	B		D	A
Approach Delay (s)	39.4		16.6			8.8
Approach LOS	D		B			A

Intersection Summary				
HCM 2000 Control Delay	14.9	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.85			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	10.6	
Intersection Capacity Utilization	79.4%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
38: Nave Dr & Hamilton Pkwy

11/22/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	90	382	523	54	319	430
Future Volume (vph)	90	382	523	54	319	430
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.2	3.2	4.4	4.4	3.0	4.4
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1599	1900	1578	1787	1850
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1599	1900	1578	1787	1900
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	95	402	551	57	336	453
RTOR Reduction (vph)	0	350	0	15	0	0
Lane Group Flow (vph)	95	52	551	42	336	453
Confl. Peds. (#/hr)				2		
Heavy Vehicles (%)	2%	1%	0%	0%	1%	0%
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Actuated Green, G (s)	9.1	9.1	28.4	28.4	21.9	53.3
Effective Green, g (s)	9.1	9.1	28.4	28.4	21.9	53.3
Actuated g/C Ratio	0.13	0.13	0.41	0.41	0.31	0.76
Clearance Time (s)	3.2	3.2	4.4	4.4	3.0	4.4
Vehicle Extension (s)	2.0	2.0	3.0	3.0	2.0	3.0
Lane Grp Cap (vph)	230	207	770	640	559	1408
v/s Ratio Prot	c0.05		c0.29		c0.19	0.24
v/s Ratio Perm		0.03		0.03		
v/c Ratio	0.41	0.25	0.72	0.07	0.60	0.32
Uniform Delay, d1	28.0	27.4	17.4	12.7	20.4	2.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	0.23
Incremental Delay, d2	0.4	0.2	5.6	0.2	1.1	0.5
Delay (s)	28.4	27.6	23.1	12.9	21.4	1.1
Level of Service	C	C	C	B	C	A
Approach Delay (s)	27.8		22.1			9.8
Approach LOS	C		C			A

Intersection Summary				
HCM 2000 Control Delay	18.5	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.63			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	10.6	
Intersection Capacity Utilization	60.5%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
39: Nave Dr & Main Gate Dr

11/22/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	352	272	292	317	266	268
Future Volume (vph)	352	272	292	317	266	268
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	4.1	4.1	3.0	4.4
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1805	1615	1900	1615	1805	1881
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1805	1615	1900	1615	1805	1881
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	371	286	307	334	280	282
RTOR Reduction (vph)	0	203	0	247	0	0
Lane Group Flow (vph)	371	83	307	87	280	282
Heavy Vehicles (%)	0%	0%	0%	0%	0%	1%
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Actuated Green, G (s)	14.7	14.7	13.2	13.2	12.4	28.3
Effective Green, g (s)	14.7	14.7	13.2	13.2	12.4	28.3
Actuated g/C Ratio	0.29	0.29	0.26	0.26	0.25	0.56
Clearance Time (s)	3.0	3.0	4.1	4.1	3.0	4.4
Vehicle Extension (s)	2.0	2.0	1.0	1.0	1.0	1.0
Lane Grp Cap (vph)	526	471	497	422	444	1056
v/s Ratio Prot	c0.21		c0.16		c0.16	0.15
v/s Ratio Perm		0.05		0.05		
v/c Ratio	0.71	0.18	0.62	0.21	0.63	0.27
Uniform Delay, d1	15.9	13.3	16.4	14.5	17.0	5.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.5	0.1	1.6	0.1	2.1	0.0
Delay (s)	19.4	13.4	18.0	14.6	19.1	5.7
Level of Service	B	B	B	B	B	A
Approach Delay (s)	16.8		16.2			12.4
Approach LOS	B		B			B

Intersection Summary				
HCM 2000 Control Delay	15.3	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.65			
Actuated Cycle Length (s)	50.4	Sum of lost time (s)	10.1	
Intersection Capacity Utilization	59.7%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
40: Nave Dr & Bolling Dr

11/22/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	219	62	560	345	98	568
Future Volume (vph)	219	62	560	345	98	568
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	4.1		3.0	3.5
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	0.97	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.95		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1787	1569	1791		1805	1881
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1787	1569	1791		1805	1881
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	228	65	583	359	102	592
RTOR Reduction (vph)	0	52	23	0	0	0
Lane Group Flow (vph)	228	13	919	0	102	592
Confl. Peds. (#/hr)		6				
Heavy Vehicles (%)	1%	0%	1%	0%	0%	1%
Turn Type	Prot	Perm	NA		Prot	NA
Protected Phases	4		6		5	2
Permitted Phases		4				
Actuated Green, G (s)	14.1	14.1	37.6		6.9	48.1
Effective Green, g (s)	14.1	14.1	37.6		6.9	48.1
Actuated g/C Ratio	0.21	0.21	0.55		0.10	0.70
Clearance Time (s)	3.0	3.0	4.1		3.0	3.5
Vehicle Extension (s)	2.0	2.0	2.0		2.0	2.0
Lane Grp Cap (vph)	366	322	980		181	1316
v/s Ratio Prot	c0.13		c0.51		c0.06	0.31
v/s Ratio Perm		0.01				
v/c Ratio	0.62	0.04	0.94		0.56	0.45
Uniform Delay, d1	24.9	21.9	14.5		29.5	4.5
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	2.4	0.0	15.5		2.4	0.1
Delay (s)	27.2	21.9	30.0		31.8	4.6
Level of Service	C	C	C		C	A
Approach Delay (s)	26.1		30.0			8.6
Approach LOS	C		C			A

Intersection Summary				
HCM 2000 Control Delay	21.7	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.82			
Actuated Cycle Length (s)	68.7	Sum of lost time (s)	10.1	
Intersection Capacity Utilization	81.7%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

HCM 2010 AWSC
41: Alameda Del Prado & Clay Ct/Nave Dr

11/22/2017

Intersection	
Intersection Delay, s/veh	19.2
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	8	10	1	103	20	751	0	68	37	273	70	12
Future Vol, veh/h	8	10	1	103	20	751	0	68	37	273	70	12
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	10	1	106	21	774	0	70	38	281	72	12
Number of Lanes	0	1	0	0	1	1	0	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	2	1
HCM Control Delay	10.7	20.8	11.8	17.8
HCM LOS	B	C	B	C

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	0%	42%	23%	0%	100%	0%
Vol Thru, %	65%	53%	4%	0%	0%	85%
Vol Right, %	35%	5%	72%	100%	0%	15%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	105	19	446	428	273	82
LT Vol	0	8	103	0	273	0
Through Vol	68	10	20	0	0	70
RT Vol	37	1	323	428	0	12
Lane Flow Rate	108	20	460	441	281	85
Geometry Grp	6	6	7	7	7	7
Degree of Util (X)	0.209	0.04	0.737	0.669	0.579	0.16
Departure Headway (Hd)	6.952	7.338	5.773	5.461	7.411	6.798
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	515	486	625	662	487	528
Service Time	5.004	5.41	3.521	3.209	5.158	4.545
HCM Lane V/C Ratio	0.21	0.041	0.736	0.666	0.577	0.161
HCM Control Delay	11.8	10.7	23	18.6	19.9	10.8
HCM Lane LOS	B	B	C	C	C	B
HCM 95th-tile Q	0.8	0.1	6.4	5.1	3.6	0.6

Intersection	
Intersection Delay, s/veh	63.9
Intersection LOS	F

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	16	593	129	0	201	488	9	0	113	12	333
Future Vol, veh/h	0	16	593	129	0	201	488	9	0	113	12	333
Peak Hour Factor	0.95	0.93	0.93	0.93	0.95	0.93	0.93	0.93	0.95	0.93	0.93	0.93
Heavy Vehicles, %	2	1	1	1	2	1	1	1	2	1	1	1
Mvmt Flow	0	17	638	139	0	216	525	10	0	122	13	358
Number of Lanes	0	1	2	0	0	1	2	0	0	0	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	3	3	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	2	3
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	1	3
HCM Control Delay	94.4	41.1	55
HCM LOS	F	E	F

Lane	NBLn1	NBLn2	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1
Vol Left, %	90%	0%	100%	0%	0%	100%	0%	0%	51%
Vol Thru, %	10%	0%	0%	100%	61%	0%	100%	95%	23%
Vol Right, %	0%	100%	0%	0%	39%	0%	0%	5%	26%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	125	333	16	395	327	201	325	172	57
LT Vol	113	0	16	0	0	201	0	0	29
Through Vol	12	0	0	395	198	0	325	163	13
RT Vol	0	333	0	0	129	0	0	9	15
Lane Flow Rate	134	358	17	425	351	216	350	185	61
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.4	0.951	0.049	1.152	0.924	0.597	0.918	0.482	0.202
Departure Headway (Hd)	11.094	9.914	10.279	9.756	9.467	10.309	9.786	9.748	12.293
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	327	369	348	374	383	352	374	373	294
Service Time	8.794	7.614	8.04	7.517	7.228	8.009	7.486	7.448	9.993
HCM Lane V/C Ratio	0.41	0.97	0.049	1.136	0.916	0.614	0.936	0.496	0.207
HCM Control Delay	21	67.7	13.6	125.8	60.4	27.2	60.2	21.2	18.1
HCM Lane LOS	C	F	B	F	F	D	F	C	C
HCM 95th-tile Q	1.9	10.3	0.2	16.5	9.8	3.7	9.5	2.5	0.7

HCM 2010 AWSC
1: Simmons Ln & San Marin Dr 06/13/2017

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	29	13	15
Future Vol, veh/h	0	29	13	15
Peak Hour Factor	0.95	0.93	0.93	0.93
Heavy Vehicles, %	2	1	1	1
Mvmt Flow	0	31	14	16
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	3
Conflicting Approach Right	EB
Conflicting Lanes Right	3
HCM Control Delay	18.1
HCM LOS	C

Novato General Plan Update EIR W-Trans
AM Peak Hour Cumulative with Project Alt

MOVEMENT SUMMARY

Site: 1 [AM Cumulative Alt]

Simmons Lane/San Marin Drive
AM Cumulative with Project Alternative

Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NB Simmons Ln											
3	L2	119	2.0	0.717	21.3	LOS C	5.9	149.5	0.87	1.04	27.4
8	T1	13	2.0	0.717	21.3	LOS C	5.9	149.5	0.87	1.04	27.4
18	R2	351	2.0	0.717	21.3	LOS C	5.9	149.5	0.87	1.04	26.8
Approach		482	2.0	0.717	21.3	LOS C	5.9	149.5	0.87	1.04	27.0
East: WB San Marin Drive											
1	L2	212	2.0	0.174	4.5	LOS A	0.8	19.4	0.29	0.17	32.6
6	T1	514	2.0	0.431	7.4	LOS A	2.5	64.5	0.40	0.25	33.6
16	R2	9	2.0	0.431	7.4	LOS A	2.5	64.5	0.40	0.25	32.7
Approach		735	2.0	0.431	6.5	LOS A	2.5	64.5	0.37	0.23	33.3
North: SB Simmons Ln											
7	L2	31	2.0	0.090	6.4	LOS A	0.3	7.8	0.57	0.57	32.8
4	T1	14	2.0	0.090	6.4	LOS A	0.3	7.8	0.57	0.57	32.8
14	R2	16	2.0	0.090	6.4	LOS A	0.3	7.8	0.57	0.57	32.0
Approach		60	2.0	0.090	6.4	LOS A	0.3	7.8	0.57	0.57	32.6
West: EB San Marin Drive											
5	L2	17	2.0	0.749	16.8	LOS B	9.0	229.2	0.84	0.78	29.5
2	T1	624	2.0	0.749	16.8	LOS B	9.0	229.2	0.84	0.78	29.5
12	R2	136	2.0	0.749	16.8	LOS B	9.0	229.2	0.84	0.78	28.8
Approach		777	2.0	0.749	16.8	LOS B	9.0	229.2	0.84	0.78	29.4
All Vehicles		2054	2.0	0.749	13.9	LOS B	9.0	229.2	0.67	0.64	30.1

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

Site: 1 [AM Cumulative Alt]

Simmons Lane/San Marin Drive
AM Cumulative with Project Alternative

Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	95% Back of Queue Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: NB Simmons Ln													
Lane 1[d]	482	2.0	673	0.717	100	21.3	LOS C	5.9	149.5	Full	1600	0.0	0.0
Approach	482	2.0		0.717		21.3	LOS C	5.9	149.5				
East: WB San Marin Drive													
Lane 1	212	2.0	1213	0.174	100	4.5	LOS A	0.8	19.4	Short	100	0.0	NA
Lane 2[d]	523	2.0	1213	0.431	100	7.4	LOS A	2.5	64.5	Full	1600	0.0	0.0
Approach	735	2.0		0.431		6.5	LOS A	2.5	64.5				
North: SB Simmons Ln													
Lane 1[d]	60	2.0	670	0.090	100	6.4	LOS A	0.3	7.8	Full	1600	0.0	0.0
Approach	60	2.0		0.090		6.4	LOS A	0.3	7.8				
West: EB San Marin Drive													
Lane 1[d]	777	2.0	1037	0.749	100	16.8	LOS B	9.0	229.2	Full	1600	0.0	0.0
Approach	777	2.0		0.749		16.8	LOS B	9.0	229.2				
Intersection	2054	2.0		0.749		13.9	LOS B	9.0	229.2				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

HCM Signalized Intersection Capacity Analysis
1: Simmons Ln & San Marin Dr

06/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	593	129	201	488	9	113	12	333	29	13	15
Future Volume (vph)	16	593	129	201	488	9	113	12	333	29	13	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.98	
Satd. Flow (prot)	1787	1881	1599	1787	1881	1599		1800	1599		1770	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.77	1.00		0.82	
Satd. Flow (perm)	1787	1881	1599	1787	1881	1599		1456	1599		1495	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	17	638	139	216	525	10	122	13	358	31	14	16
RTOR Reduction (vph)	0	0	59	0	0	4	0	0	88	0	13	0
Lane Group Flow (vph)	17	638	80	216	525	6	0	135	270	0	48	0
Heavy Vehicles (%)	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	pm+ov	Perm	NA	
Protected Phases	7	4		3	8			2	3		6	
Permitted Phases			4			8	2		2	6		
Actuated Green, G (s)	0.6	32.1	32.1	13.1	44.6	44.6		13.3	26.4		13.3	
Effective Green, g (s)	0.6	32.1	32.1	13.1	44.6	44.6		13.3	26.4		13.3	
Actuated g/C Ratio	0.01	0.46	0.46	0.19	0.63	0.63		0.19	0.37		0.19	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	
Lane Grp Cap (vph)	15	856	728	332	1189	1011		274	689		282	
v/s Ratio Prot	0.01	c0.34		c0.12	0.28				c0.07			
v/s Ratio Perm			0.05			0.00		c0.09	0.10		0.03	
v/c Ratio	1.13	0.75	0.11	0.65	0.44	0.01		0.49	0.39		0.17	
Uniform Delay, d1	35.0	15.8	11.0	26.6	6.6	4.8		25.6	16.2		24.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2	279.2	3.6	0.1	4.5	0.3	0.0		1.4	0.4		0.3	
Delay (s)	314.1	19.4	11.1	31.1	6.9	4.8		27.0	16.5		24.3	
Level of Service	F	B	B	C	A	A		C	B		C	
Approach Delay (s)		24.2			13.8			19.4			24.3	
Approach LOS		C			B			B			C	

Intersection Summary				
HCM 2000 Control Delay	19.4	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.67			
Actuated Cycle Length (s)	70.5	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	65.2%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
2: W Campus Dr & San Marin Dr

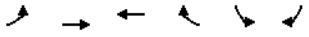
06/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	950	2	2	710	204	1	0	4	25	0	1
Future Volume (vph)	37	950	2	2	710	204	1	0	4	25	0	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.8		4.0	4.8	4.8		4.0		4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00		0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85		0.89		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99		0.95	0.95	1.00
Satd. Flow (prot)	1805	3573		1805	3574	1615		1678		1715	1715	1615
Flt Permitted	0.95	1.00		0.95	1.00	1.00		1.00		1.00	1.00	1.00
Satd. Flow (perm)	1805	3573		1805	3574	1615		1695		1805	1805	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	40	1033	2	2	772	222	1	0	4	27	0	1
RTOR Reduction (vph)	0	0	0	0	0	102	0	5	0	0	0	1
Lane Group Flow (vph)	40	1035	0	2	772	120	0	0	0	13	14	0
Confl. Peds. (#/hr)			2									
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8			4		4
Actuated Green, G (s)	2.3	21.6		1.0	20.3	20.3		2.3		2.3	2.3	2.3
Effective Green, g (s)	2.3	21.6		1.0	20.3	20.3		2.3		2.3	2.3	2.3
Actuated g/C Ratio	0.06	0.57		0.03	0.54	0.54		0.06		0.06	0.06	0.06
Clearance Time (s)	4.0	4.8		4.0	4.8	4.8		4.0		4.0	4.0	4.0
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0		2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	110	2047		47	1924	869		103		110	110	98
v/s Ratio Prot	c0.02	c0.29		0.00	0.22							
v/s Ratio Perm						0.07		0.00		0.01	c0.01	0.00
v/c Ratio	0.36	0.51		0.04	0.40	0.14		0.00		0.12	0.13	0.00
Uniform Delay, d1	17.0	4.8		17.9	5.1	4.3		16.6		16.7	16.8	16.6
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00		1.00	1.00	1.00
Incremental Delay, d2	0.7	0.3		0.1	0.2	0.1		0.0		0.2	0.2	0.0
Delay (s)	17.7	5.1		18.0	5.3	4.4		16.6		16.9	16.9	16.6
Level of Service	B	A		B	A	A		B		B	B	B
Approach Delay (s)		5.6			5.1			16.6			16.9	
Approach LOS		A			A			B			B	

Intersection Summary				
HCM 2000 Control Delay	5.5	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.48			
Actuated Cycle Length (s)	37.7	Sum of lost time (s)	12.8	
Intersection Capacity Utilization	47.0%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
3: San Marin Dr & E Campus Drive

06/13/2017



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	71	972	914	400	64	48
Future Volume (vph)	71	972	914	400	64	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.3	4.3	4.3	3.0	3.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1805	3574	3574	1615	3502	1594
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1805	3574	3574	1615	3502	1594
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	77	1057	993	435	70	52
RTOR Reduction (vph)	0	0	0	103	0	48
Lane Group Flow (vph)	77	1057	993	332	70	4
Confl. Peds. (#/hr)						1
Heavy Vehicles (%)	0%	1%	1%	0%	0%	0%
Turn Type	Prot	NA	NA	Perm	Perm	Perm
Protected Phases	5	2	6			
Permitted Phases				6	4	4
Actuated Green, G (s)	10.0	112.1	99.1	99.1	10.6	10.6
Effective Green, g (s)	10.0	112.1	99.1	99.1	10.6	10.6
Actuated g/C Ratio	0.08	0.86	0.76	0.76	0.08	0.08
Clearance Time (s)	3.0	4.3	4.3	4.3	3.0	3.0
Vehicle Extension (s)	2.0	4.0	4.0	4.0	2.0	2.0
Lane Grp Cap (vph)	138	3081	2724	1231	285	129
v/s Ratio Prot	c0.04	0.30	c0.28			
v/s Ratio Perm				0.21	c0.02	0.00
v/c Ratio	0.56	0.34	0.36	0.27	0.25	0.03
Uniform Delay, d1	57.9	1.8	5.1	4.6	56.0	55.0
Progression Factor	1.00	1.00	0.54	0.36	1.00	1.00
Incremental Delay, d2	2.8	0.3	0.1	0.1	0.2	0.0
Delay (s)	60.6	2.1	2.8	1.8	56.1	55.0
Level of Service	E	A	A	A	E	E
Approach Delay (s)		6.0	2.5		55.6	
Approach LOS		A	A		E	

Intersection Summary				
HCM 2000 Control Delay	6.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.37		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	10.3
Intersection Capacity Utilization	51.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
4: Redwood Blvd & San Marin Dr

06/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	71	797	171	378	1086	737	179	143	314	180	60	48
Future Volume (vph)	71	797	171	378	1086	737	179	143	314	180	60	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.6		3.0	4.0		4.3	4.3	4.3	4.3	4.3	
Lane Util. Factor	1.00	0.91		1.00	0.91		0.97	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	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	1.00	
Frt	1.00	0.97		1.00	0.94		1.00	1.00	0.85	1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1787	4986		1752	4824		3467	1881	1568	1787	1741	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1787	4986		1752	4824		3467	1881	1568	1787	1741	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	75	839	180	398	1143	776	188	151	331	189	63	51
RTOR Reduction (vph)	0	26	0	0	70	0	0	0	293	0	25	0
Lane Group Flow (vph)	75	993	0	398	1849	0	188	151	38	189	89	0
Confl. Peds. (#/hr)			4									5
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	1%	1%	1%	3%	1%	1%	1%	1%	3%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA		Split	NA	Perm	Split	NA	
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases					2				7			
Actuated Green, G (s)	8.3	44.8		35.3	71.4		14.8	14.8	14.8	19.9	19.9	
Effective Green, g (s)	8.3	44.8		35.3	71.4		14.8	14.8	14.8	19.9	19.9	
Actuated g/C Ratio	0.06	0.34		0.27	0.55		0.11	0.11	0.11	0.15	0.15	
Clearance Time (s)	3.0	3.6		3.0	4.0		4.3	4.3	4.3	4.3	4.3	
Vehicle Extension (s)	2.0	4.0		5.0	4.0		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	114	1718		475	2649		394	214	178	273	266	
v/s Ratio Prot	0.04	0.20		c0.23	c0.38		0.05	c0.08		c0.11	0.05	
v/s Ratio Perm									0.02			
v/c Ratio	0.66	0.58		0.84	0.70		0.48	0.71	0.21	0.69	0.33	
Uniform Delay, d1	59.5	34.9		44.7	21.4		54.0	55.5	52.3	52.1	49.1	
Progression Factor	1.17	0.95		1.03	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	9.6	1.4		7.9	0.9		0.3	8.3	0.2	6.0	0.3	
Delay (s)	79.0	34.4		53.8	22.2		54.3	63.8	52.5	58.2	49.4	
Level of Service	E	C		D	C		D	E	D	E	D	
Approach Delay (s)		37.5			27.6			55.6			54.9	
Approach LOS		D			C			E			D	

Intersection Summary				
HCM 2000 Control Delay	36.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	15.6
Intersection Capacity Utilization	92.3%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
4: Redwood Blvd & San Marin Dr

06/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	71	797	171	378	1086	737	179	143	314	180	60	48
Future Volume (vph)	71	797	171	378	1086	737	179	143	314	180	60	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.6		3.0	4.0	4.3	4.3	4.3	3.0	4.3	4.3	
Lane Util. Factor	1.00	0.91		0.97	0.95	1.00	0.95	0.95	0.88	0.91	0.91	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	0.99	1.00	0.95	0.98	
Satd. Flow (prot)	1787	4986		3400	3574	1599	1698	1775	2760	1626	3209	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	0.99	1.00	0.95	0.98	
Satd. Flow (perm)	1787	4986		3400	3574	1599	1698	1775	2760	1626	3209	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	75	839	180	398	1143	776	188	151	331	189	63	51
RTOR Reduction (vph)	0	25	0	0	0	72	0	0	220	0	31	0
Lane Group Flow (vph)	75	994	0	398	1143	704	165	174	111	102	170	0
Confl. Peds. (#/hr)			4									5
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	1%	1%	1%	3%	1%	1%	1%	1%	3%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA	pm+ov	Split	NA	
Protected Phases	5	2		1	6	4	8	8	1	4	4	
Permitted Phases						6			8			
Actuated Green, G (s)	8.0	48.7		26.2	66.5	87.6	16.8	16.8	43.0	21.1	21.1	
Effective Green, g (s)	8.0	48.7		26.2	66.5	87.6	16.8	16.8	43.0	21.1	21.1	
Actuated g/C Ratio	0.06	0.38		0.20	0.52	0.68	0.13	0.13	0.34	0.16	0.16	
Clearance Time (s)	3.0	3.6		3.0	4.0	4.3	4.3	4.3	3.0	4.3	4.3	
Vehicle Extension (s)	2.0	4.0		5.0	4.0	2.0	2.0	2.0	5.0	2.0	2.0	
Lane Grp Cap (vph)	111	1897		695	1856	1094	222	232	927	268	528	
v/s Ratio Prot	c0.04	0.20		0.12	0.32	c0.11	0.10	c0.10	0.02	0.06	0.05	
v/s Ratio Perm						0.33			0.02			
v/c Ratio	0.68	0.52		0.57	0.62	0.64	0.74	0.75	0.12	0.38	0.32	
Uniform Delay, d1	58.7	30.7		45.9	21.7	11.4	53.5	53.6	29.4	47.6	47.1	
Progression Factor	1.00	1.00		1.00	0.76	1.19	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	12.0	1.0		1.2	1.0	0.6	11.1	11.4	0.1	0.3	0.1	
Delay (s)	70.8	31.7		46.8	17.4	14.2	64.7	65.0	29.5	48.0	47.3	
Level of Service	E	C		D	B	B	E	E	C	D	D	
Approach Delay (s)		34.4			21.4			47.4			47.5	
Approach LOS		C			C			D			D	

Intersection Summary				
HCM 2000 Control Delay	30.4	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.66			
Actuated Cycle Length (s)	128.0	Sum of lost time (s)	15.6	
Intersection Capacity Utilization	82.6%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
5: US 101 SB Ramps & San Marin Dr

06/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	744	549	186	1451	0	0	0	0	101	1	750
Future Volume (vph)	0	744	549	186	1451	0	0	0	0	101	1	750
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9	4.9	3.0	5.3						4.0	4.0
Lane Util. Factor		0.95	1.00	1.00	0.95						1.00	0.88
Frpb, ped/bikes		1.00	0.99	1.00	1.00						1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		3574	1575	1805	3574						1810	2814
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		3574	1575	1805	3574						1810	2814
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)	0	791	584	198	1544	0	0	0	0	107	1	798
RTOR Reduction (vph)	0	0	332	0	0	0	0	0	0	0	0	66
Lane Group Flow (vph)	0	791	252	198	1544	0	0	0	0	0	108	732
Confl. Peds. (#/hr)			4									
Heavy Vehicles (%)	0%	1%	1%	0%	1%	0%	0%	0%	0%	0%	0%	1%
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			2									4
Actuated Green, G (s)		28.1	28.1	8.0	38.7						17.0	17.0
Effective Green, g (s)		28.1	28.1	8.0	38.7						17.0	17.0
Actuated g/C Ratio		0.43	0.43	0.12	0.60						0.26	0.26
Clearance Time (s)		4.9	4.9	3.0	5.3						4.0	4.0
Vehicle Extension (s)		4.0	4.0	2.0	4.0						2.0	2.0
Lane Grp Cap (vph)		1545	680	222	2127						473	735
v/s Ratio Prot		0.22		c0.11	c0.43						0.06	
v/s Ratio Perm			0.16									c0.26
v/c Ratio		0.51	0.37	0.89	0.73						0.23	1.00
Uniform Delay, d1		13.5	12.5	28.1	9.4						18.8	24.0
Progression Factor		0.43	2.72	1.00	1.00						1.00	1.00
Incremental Delay, d2		1.0	1.3	32.3	2.2						0.1	32.0
Delay (s)		6.8	35.2	60.3	11.6						18.9	56.0
Level of Service		A	D	E	B						B	E
Approach Delay (s)		18.9			17.1			0.0			51.6	
Approach LOS		B			B			A			D	

Intersection Summary				
HCM 2000 Control Delay	25.5	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.87			
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	11.9	
Intersection Capacity Utilization	113.1%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
6: US 101 NB Ramps & San Marin Dr

06/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	411	432	0	0	757	96	874	0	180	0	0	0
Future Volume (vph)	411	432	0	0	757	96	874	0	180	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.6			4.9	4.9	3.5	3.5				
Lane Util. Factor	0.97	1.00			0.95	1.00	0.95	0.95				
Frpb, ped/bikes	1.00	1.00			1.00	0.99	1.00	0.99				
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00				
Frt	1.00	1.00			1.00	0.85	1.00	0.95				
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.97				
Satd. Flow (prot)	3467	1881			3574	1594	1681	1606				
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.97				
Satd. Flow (perm)	3467	1881			3574	1594	1681	1606				
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	433	455	0	0	797	101	920	0	189	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	73	0	57	0	0	0	0
Lane Group Flow (vph)	433	455	0	0	797	28	570	482	0	0	0	0
Confl. Peds. (#/hr)			3			1			1	1		
Heavy Vehicles (%)	1%	1%	0%	0%	1%	0%	2%	0%	3%	0%	0%	0%
Turn Type	Prot	NA			NA	Perm	Split	NA				
Protected Phases	5	2			6		8	8				
Permitted Phases						6						
Actuated Green, G (s)	9.4	30.5			17.3	17.3	23.5	23.5				
Effective Green, g (s)	9.4	30.5			17.3	17.3	23.5	23.5				
Actuated g/C Ratio	0.15	0.49			0.28	0.28	0.38	0.38				
Clearance Time (s)	3.5	4.6			4.9	4.9	3.5	3.5				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	2.5	2.5				
Lane Grp Cap (vph)	524	923			995	444	636	607				
v/s Ratio Prot	c0.12	0.24			c0.22		c0.34	0.30				
v/s Ratio Perm						0.02						
v/c Ratio	0.83	0.49			0.80	0.06	0.90	0.79				
Uniform Delay, d1	25.6	10.6			20.8	16.5	18.2	17.2				
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00				
Incremental Delay, d2	9.8	0.6			5.0	0.1	15.2	6.9				
Delay (s)	35.4	11.2			25.8	16.5	33.3	24.0				
Level of Service	D	B			C	B	C	C				
Approach Delay (s)		23.0			24.7			28.8			0.0	
Approach LOS		C			C			C			A	

Intersection Summary				
HCM 2000 Control Delay	25.8	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.85			
Actuated Cycle Length (s)	62.1	Sum of lost time (s)	11.9	
Intersection Capacity Utilization	113.1%	ICU Level of Service	H	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
6: US 101 NB Ramps & San Marin Dr

06/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	411	432	0	0	757	96	874	0	180	0	0	0
Future Volume (vph)	411	432	0	0	757	96	874	0	180	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.6			4.9	4.9	3.5	3.5				
Lane Util. Factor	0.97	1.00			0.95	1.00	0.97	1.00				
Frpb, ped/bikes	1.00	1.00			1.00	0.99	1.00	0.98				
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00				
Frt	1.00	1.00			1.00	0.85	1.00	0.85				
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00				
Satd. Flow (prot)	3467	1881			3574	1594	3433	1535				
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00				
Satd. Flow (perm)	3467	1881			3574	1594	3433	1535				
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	433	455	0	0	797	101	920	0	189	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	50	0	100	0	0	0	0
Lane Group Flow (vph)	433	455	0	0	797	51	920	89	0	0	0	0
Confl. Peds. (#/hr)			3			1			1	1		
Heavy Vehicles (%)	1%	1%	0%	0%	1%	0%	2%	0%	3%	0%	0%	0%
Turn Type	Prot	NA			NA	Perm	Split	NA				
Protected Phases	5	2			6		8	8				
Permitted Phases						6						
Actuated Green, G (s)	20.3	59.9			35.8	35.8	60.0	60.0				
Effective Green, g (s)	20.3	59.9			35.8	35.8	60.0	60.0				
Actuated g/C Ratio	0.16	0.47			0.28	0.28	0.47	0.47				
Clearance Time (s)	3.5	4.6			4.9	4.9	3.5	3.5				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	2.5	2.5				
Lane Grp Cap (vph)	549	880			999	445	1609	719				
v/s Ratio Prot	c0.12	0.24			c0.22		c0.27	0.06				
v/s Ratio Perm						0.03						
v/c Ratio	0.79	0.52			0.80	0.11	0.57	0.12				
Uniform Delay, d1	51.8	23.9			42.7	34.3	24.7	19.2				
Progression Factor	0.73	0.38			1.00	1.00	1.00	1.00				
Incremental Delay, d2	5.8	0.6			4.8	0.2	1.5	0.4				
Delay (s)	43.6	9.8			47.5	34.5	26.2	19.5				
Level of Service	D	A			D	C	C	B				
Approach Delay (s)		26.3			46.0			25.0			0.0	
Approach LOS		C			D			C			A	

Intersection Summary				
HCM 2000 Control Delay	31.9	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.68			
Actuated Cycle Length (s)	128.0	Sum of lost time (s)	11.9	
Intersection Capacity Utilization	100.4%	ICU Level of Service	G	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
7: Redwood Blvd & Olive St

06/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	111	98	33	142	130	116	18	452	139	151	409	87
Future Volume (vph)	111	98	33	142	130	116	18	452	139	151	409	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.1	5.1			5.1		4.0	3.9	3.9	4.0	3.9	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.96			0.96		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00			0.98		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1792			1755		1770	3539	1583	1770	3446	
Flt Permitted	0.95	1.00			0.98		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1792			1755		1770	3539	1583	1770	3446	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	121	107	36	154	141	126	20	491	151	164	445	95
RTOR Reduction (vph)	0	12	0	0	13	0	0	0	101	0	16	0
Lane Group Flow (vph)	121	131	0	0	408	0	20	491	50	164	524	0
Turn Type	Split	NA		Split	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	11.8	11.8			25.4		3.5	18.2	18.2	11.6	26.3	
Effective Green, g (s)	11.8	11.8			25.4		3.5	18.2	18.2	11.6	26.3	
Actuated g/C Ratio	0.14	0.14			0.30		0.04	0.21	0.21	0.14	0.31	
Clearance Time (s)	5.1	5.1			5.1		4.0	3.9	3.9	4.0	3.9	
Vehicle Extension (s)	1.0	1.0			1.0		1.0	1.0	1.0	1.0	1.0	
Lane Grp Cap (vph)	245	248			523		72	756	338	241	1064	
v/s Ratio Prot	0.07	c0.07			c0.23		0.01	c0.14		c0.09	0.15	
v/s Ratio Perm									0.03			
v/c Ratio	0.49	0.53			0.78		0.28	0.65	0.15	0.68	0.49	
Uniform Delay, d1	33.9	34.1			27.3		39.6	30.5	27.2	35.0	24.0	
Progression Factor	1.00	1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.6	0.9			6.9		0.8	1.5	0.1	6.2	0.1	
Delay (s)	34.5	35.0			34.2		40.3	32.0	27.2	41.1	24.1	
Level of Service	C	C			C		D	C	C	D	C	
Approach Delay (s)		34.8			34.2			31.2			28.1	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM 2000 Control Delay	31.2	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.68			
Actuated Cycle Length (s)	85.1	Sum of lost time (s)	18.1	
Intersection Capacity Utilization	66.5%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
8: Redwood Blvd & Grant Ave

06/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	99	199	23	76	45	224	389	48	35	434	87
Future Volume (vph)	100	99	199	23	76	45	224	389	48	35	434	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5		3.5	3.7	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	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		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1763	1900	1564	1803	1900	1588	1805	3474		1805	3438	
Flt Permitted	0.70	1.00	1.00	0.69	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1304	1900	1564	1305	1900	1588	1805	3474		1805	3438	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	109	108	216	25	83	49	243	423	52	38	472	95
RTOR Reduction (vph)	0	0	156	0	0	35	0	8	0	0	16	0
Lane Group Flow (vph)	109	108	60	25	83	14	243	467	0	38	551	0
Confl. Peds. (#/hr)	9		11	2		1			10			9
Confl. Bikes (#/hr)			5			5			5			5
Heavy Vehicles (%)	2%	0%	1%	0%	0%	0%	0%	2%	0%	0%	2%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8		8	4		4						
Actuated Green, G (s)	17.7	17.7	17.7	17.7	17.7	17.7	15.6	28.8		6.7	19.7	
Effective Green, g (s)	17.7	17.7	17.7	17.7	17.7	17.7	15.6	28.8		6.7	19.7	
Actuated g/C Ratio	0.28	0.28	0.28	0.28	0.28	0.28	0.24	0.45		0.10	0.31	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5		3.5	3.7	
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0	4.0	2.5	3.0		2.5	3.0	
Lane Grp Cap (vph)	359	523	431	359	523	437	438	1558		188	1054	
v/s Ratio Prot		0.06			0.04		c0.13	0.13		0.02	c0.16	
v/s Ratio Perm	c0.08		0.04	0.02		0.01						
v/c Ratio	0.30	0.21	0.14	0.07	0.16	0.03	0.55	0.30		0.20	0.52	
Uniform Delay, d1	18.4	17.9	17.5	17.2	17.6	17.0	21.3	11.3		26.3	18.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.7	0.3	0.2	0.1	0.2	0.0	1.2	0.1		0.4	0.5	
Delay (s)	19.0	18.1	17.7	17.3	17.8	17.0	22.5	11.4		26.7	18.8	
Level of Service	B	B	B	B	B	B	C	B		C	B	
Approach Delay (s)		18.1			17.5			15.1			19.3	
Approach LOS		B			B			B			B	

Intersection Summary				
HCM 2000 Control Delay	17.3	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.46			
Actuated Cycle Length (s)	64.2	Sum of lost time (s)	11.2	
Intersection Capacity Utilization	55.7%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM 2010 AWSC
9: San Marin Dr/Sutro Ave & Novato Blvd 06/13/2017

Intersection	
Intersection Delay, s/veh	39
Intersection LOS	E

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations																
Traffic Vol, veh/h	0	108	193	63	0	21	180	177	0	116	161	51	0	197	98	102
Future Vol, veh/h	0	108	193	63	0	21	180	177	0	116	161	51	0	197	98	102
Peak Hour Factor	0.95	0.92	0.92	0.92	0.95	0.92	0.92	0.92	0.95	0.92	0.92	0.92	0.95	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	117	210	68	0	23	196	192	0	126	175	55	0	214	107	111
Number of Lanes	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	3	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	3	2	2
HCM Control Delay	30.8	76.9	24.8	22.1
HCM LOS	D	F	C	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%	0%
Vol Thru, %	0%	76%	0%	75%	0%	50%	0%	100%	0%
Vol Right, %	0%	24%	0%	25%	0%	50%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	116	212	108	256	21	357	197	98	102
LT Vol	116	0	108	0	21	0	197	0	0
Through Vol	0	161	0	193	0	180	0	98	0
RT Vol	0	51	0	63	0	177	0	0	102
Lane Flow Rate	126	230	117	278	23	388	214	107	111
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.363	0.622	0.333	0.745	0.065	1.014	0.609	0.288	0.281
Departure Headway (Hd)	10.718	10.014	10.448	9.749	10.284	9.406	10.499	9.976	9.244
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	338	364	346	373	352	392	347	362	391
Service Time	8.418	7.714	8.148	7.449	7.939	7.061	8.199	7.676	6.944
HCM Lane V/C Ratio	0.373	0.632	0.338	0.745	0.065	0.99	0.617	0.296	0.284
HCM Control Delay	19.4	27.8	18.3	36.1	13.6	80.6	28.3	16.7	15.5
HCM Lane LOS	C	D	C	E	B	F	D	C	C
HCM 95th-tile Q	1.6	4	1.4	5.9	0.2	12.4	3.8	1.2	1.1

HCM Signalized Intersection Capacity Analysis
9: San Marin Dr/Sutro Ave & Novato Blvd #1 06/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	108	193	63	21	180	177	116	161	51	197	98	102
Future Volume (vph)	108	193	63	21	180	177	116	161	51	197	98	102
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.93		1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1794		1770	1724		1770	1796		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	1794		1770	1724		1770	1796		1770	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	117	210	68	23	196	192	126	175	55	214	107	111
RTOR Reduction (vph)	0	12	0	0	38	0	0	13	0	0	0	77
Lane Group Flow (vph)	117	266	0	23	350	0	126	217	0	214	107	34
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	7.0	25.9		1.6	20.5		7.8	15.7		13.5	21.4	21.4
Effective Green, g (s)	7.0	25.9		1.6	20.5		7.8	15.7		13.5	21.4	21.4
Actuated g/C Ratio	0.10	0.37		0.02	0.29		0.11	0.22		0.19	0.30	0.30
Clearance Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	175	657		40	499		195	398		337	563	479
v/s Ratio Prot	c0.07	0.15		0.01	c0.20		0.07	c0.12		c0.12	0.06	
v/s Ratio Perm												0.02
v/c Ratio	0.67	0.40		0.57	0.70		0.65	0.54		0.64	0.19	0.07
Uniform Delay, d1	30.7	16.7		34.2	22.4		30.1	24.3		26.3	18.2	17.6
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	9.3	0.4		18.4	4.4		7.2	1.5		3.9	0.2	0.1
Delay (s)	40.0	17.1		52.6	26.8		37.3	25.9		30.2	18.4	17.6
Level of Service	D	B		D	C		D	C		C	B	B
Approach Delay (s)		23.9			28.2			29.9			24.1	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM 2000 Control Delay	26.4	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.64			
Actuated Cycle Length (s)	70.7	Sum of lost time (s)	14.0	
Intersection Capacity Utilization	62.1%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

MOVEMENT SUMMARY

Site: 9 [AM Cumulative Alt]

Novato Boulevard/San Marin Dr-Sutro Ave
AM Cumulative with Project Alternative

Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NB Sutro Ave											
3	L2	126	2.0	0.463	10.9	LOS B	2.6	66.9	0.70	0.74	31.2
8	T1	175	2.0	0.463	10.9	LOS B	2.6	66.9	0.70	0.74	31.2
18	R2	55	2.0	0.463	10.9	LOS B	2.6	66.9	0.70	0.74	30.4
Approach		357	2.0	0.463	10.9	LOS B	2.6	66.9	0.70	0.74	31.1
East: WB Novato Blvd											
1	L2	23	2.0	0.469	10.0	LOS B	2.8	70.8	0.66	0.65	32.3
6	T1	196	2.0	0.469	10.0	LOS B	2.8	70.8	0.66	0.65	32.3
16	R2	192	2.0	0.469	10.0	LOS B	2.8	70.8	0.66	0.65	31.4
Approach		411	2.0	0.469	10.0	LOS B	2.8	70.8	0.66	0.65	31.9
North: SB San Marin Drive											
7	L2	214	2.0	0.317	6.8	LOS A	1.5	37.8	0.51	0.42	32.3
4	T1	107	2.0	0.317	6.8	LOS A	1.5	37.8	0.51	0.42	32.3
14	R2	111	2.0	0.110	4.5	LOS A	0.4	11.0	0.42	0.32	34.0
Approach		432	2.0	0.317	6.2	LOS A	1.5	37.8	0.48	0.40	32.7
West: EB Novato Blvd											
5	L2	117	2.0	0.418	8.6	LOS A	2.3	58.1	0.60	0.52	32.4
2	T1	210	2.0	0.418	8.6	LOS A	2.3	58.1	0.60	0.52	32.4
12	R2	68	2.0	0.418	8.6	LOS A	2.3	58.1	0.60	0.52	31.6
Approach		396	2.0	0.418	8.6	LOS A	2.3	58.1	0.60	0.52	32.2
All Vehicles		1595	2.0	0.469	8.9	LOS A	2.8	70.8	0.61	0.57	32.0

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

Site: 9 [AM Cumulative Alt]

Novato Boulevard/San Marin Dr-Sutro Ave
AM Cumulative with Project Alternative

Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: NB Sutro Ave													
Lane 1[d]	357	2.0	770	0.463	100	10.9	LOS B	2.6	66.9	Full	1600	0.0	0.0
Approach	357	2.0		0.463		10.9	LOS B	2.6	66.9				
East: WB Novato Blvd													
Lane 1[d]	411	2.0	875	0.469	100	10.0	LOS B	2.8	70.8	Full	1600	0.0	0.0
Approach	411	2.0		0.469		10.0	LOS B	2.8	70.8				
North: SB San Marin Drive													
Lane 1[d]	321	2.0	1011	0.317	100	6.8	LOS A	1.5	37.8	Full	1600	0.0	0.0
Lane 2	111	2.0	1011	0.110	100	4.5	LOS A	0.4	11.0	Short	30	0.0	NA
Approach	432	2.0		0.317		6.2	LOS A	1.5	37.8				
West: EB Novato Blvd													
Lane 1[d]	396	2.0	946	0.418	100	8.6	LOS A	2.3	58.1	Full	1600	0.0	0.0
Approach	396	2.0		0.418		8.6	LOS A	2.3	58.1				
Intersection	1595	2.0		0.469		8.9	LOS A	2.8	70.8				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

HCM Signalized Intersection Capacity Analysis
10: Wilson Ave & Novato Blvd

11/22/2017

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	725	17	270	478	30	466
Future Volume (vph)	725	17	270	478	30	466
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.9		3.0	3.6	3.6	3.6
Lane Util. Factor	0.95		1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	1.00		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3561		1787	3610	1805	1593
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3561		1787	3610	1805	1593
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	853	20	318	562	35	548
RTOR Reduction (vph)	1	0	0	0	0	348
Lane Group Flow (vph)	872	0	318	562	35	200
Confl. Peds. (#/hr)		3			6	2
Heavy Vehicles (%)	1%	0%	1%	0%	0%	0%
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases						4
Actuated Green, G (s)	45.8		18.0	46.1	15.7	15.7
Effective Green, g (s)	45.8		18.0	46.1	15.7	15.7
Actuated g/C Ratio	0.51		0.20	0.51	0.17	0.17
Clearance Time (s)	3.9		3.0	3.6	3.6	3.6
Vehicle Extension (s)	3.0		2.0	3.0	2.0	2.0
Lane Grp Cap (vph)	1812		357	1849	314	277
v/s Ratio Prot	c0.24		c0.18	0.16	0.02	
v/s Ratio Perm						c0.13
v/c Ratio	0.48		0.89	0.30	0.11	0.72
Uniform Delay, d1	14.4		35.0	12.7	31.3	35.1
Progression Factor	1.00		1.03	0.49	1.00	1.00
Incremental Delay, d2	0.9		21.4	0.4	0.1	7.6
Delay (s)	15.3		57.4	6.6	31.3	42.7
Level of Service	B		E	A	C	D
Approach Delay (s)	15.3			25.0	42.0	
Approach LOS	B			C	D	

Intersection Summary				
HCM 2000 Control Delay	25.6	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.62			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.5	
Intersection Capacity Utilization	56.3%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
11: Novato Blvd & Simmons Ln

11/22/2017

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	291	880	491	96	87	277
Future Volume (vph)	291	880	491	96	87	277
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.9	3.6		3.0	3.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.98		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	3574	3510		1805	1599
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1805	3574	3510		1805	1599
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	342	1035	578	113	102	326
RTOR Reduction (vph)	0	0	14	0	0	267
Lane Group Flow (vph)	342	1035	677	0	102	59
Confl. Peds. (#/hr)					2	
Confl. Bikes (#/hr)				1		
Heavy Vehicles (%)	0%	1%	0%	0%	0%	1%
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	5	2	6		8	
Permitted Phases						8
Actuated Green, G (s)	18.0	45.8	46.1		16.3	16.3
Effective Green, g (s)	18.0	45.8	46.1		16.3	16.3
Actuated g/C Ratio	0.20	0.51	0.51		0.18	0.18
Clearance Time (s)	3.0	3.9	3.6		3.0	3.0
Vehicle Extension (s)	2.0	3.0	3.0		2.0	2.0
Lane Grp Cap (vph)	361	1818	1797		326	289
v/s Ratio Prot	c0.19	c0.29	0.19		c0.06	
v/s Ratio Perm						0.04
v/c Ratio	0.95	0.57	0.38		0.31	0.20
Uniform Delay, d1	35.5	15.3	13.3		32.0	31.3
Progression Factor	1.05	0.49	1.00		1.00	1.00
Incremental Delay, d2	32.0	1.1	0.6		0.2	0.1
Delay (s)	69.4	8.5	13.9		32.2	31.5
Level of Service	E	A	B		C	C
Approach Delay (s)		23.7	13.9		31.6	
Approach LOS		C	B		C	

Intersection Summary				
HCM 2000 Control Delay	22.3	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.61			
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.5	
Intersection Capacity Utilization	47.8%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
12: Novato Blvd & Grant Ave

01/23/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	200	877	3	4	437	60	1	0	2	37	1	186
Future Volume (vph)	200	877	3	4	437	60	1	0	2	37	1	186
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.5	4.5	3.5	4.9	4.9		4.0		3.5	3.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00		1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.96		0.97		1.00	0.98	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00		1.00		0.98	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.91		1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.98		0.95	1.00	
Satd. Flow (prot)	1787	1863	1576	1805	3539	1534		1644		1748	1569	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.70		0.76	1.00	
Satd. Flow (perm)	1787	1863	1576	1805	3539	1534		1168		1390	1569	
Peak-hour factor, PHF	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Adj. Flow (vph)	235	1032	4	5	514	71	1	0	2	44	1	219
RTOR Reduction (vph)	0	0	1	0	0	28	0	3	0	0	194	0
Lane Group Flow (vph)	235	1032	3	5	514	43	0	0	0	44	26	0
Confl. Peds. (#/hr)			1			8	5		12	12		5
Confl. Bikes (#/hr)			4			2			2			1
Heavy Vehicles (%)	1%	2%	0%	0%	2%	1%	0%	0%	0%	1%	0%	1%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8			4		
Actuated Green, G (s)	16.7	75.9	75.9	1.2	60.0	60.0		10.9		11.4	11.4	
Effective Green, g (s)	16.7	75.9	75.9	1.2	60.0	60.0		10.9		11.4	11.4	
Actuated g/C Ratio	0.17	0.76	0.76	0.01	0.60	0.60		0.11		0.11	0.11	
Clearance Time (s)	3.5	4.5	4.5	3.5	4.9	4.9		4.0		3.5	3.5	
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0	3.0		2.0		2.0	2.0	
Lane Grp Cap (vph)	298	1414	1196	21	2123	920		127		158	178	
v/s Ratio Prot	c0.13	c0.55		0.00	0.15						0.02	
v/s Ratio Perm			0.00			0.03		0.00		c0.03		
v/c Ratio	0.79	0.73	0.00	0.24	0.24	0.05		0.00		0.28	0.15	
Uniform Delay, d1	40.0	6.5	2.9	48.9	9.4	8.2		39.7		40.5	39.9	
Progression Factor	1.00	1.00	1.00	0.87	1.00	1.50		1.00		1.00	1.00	
Incremental Delay, d2	12.0	1.9	0.0	2.0	0.3	0.1		0.0		0.4	0.1	
Delay (s)	52.0	8.4	2.9	44.8	9.6	12.5		39.7		40.9	40.1	
Level of Service	D	A	A	D	A	B		D		D	D	
Approach Delay (s)		16.5			10.3			39.7			40.2	
Approach LOS		B			B			D			D	

Intersection Summary				
HCM 2000 Control Delay	17.7	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.71			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.4	
Intersection Capacity Utilization	75.3%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
13: Tamalpais Ave/7th St & Novato Blvd

01/23/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	96	785	37	62	460	122	39	102	38	72	109	46
Future Volume (vph)	96	785	37	62	460	122	39	102	38	72	109	46
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.0		3.5	5.0	5.0	3.5	3.5		3.5	3.5	3.5
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.95	1.00	0.99		1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.99	1.00		1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1787	1847		1787	1863	1523	1770	1794		1784	1881	1531
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.56	1.00		0.46	1.00	1.00
Satd. Flow (perm)	1787	1847		1787	1863	1523	1049	1794		862	1881	1531
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)	102	835	39	66	489	130	41	109	40	77	116	49
RTOR Reduction (vph)	0	1	0	0	0	19	0	15	0	0	0	42
Lane Group Flow (vph)	102	873	0	66	489	111	41	134	0	77	116	7
Confl. Peds. (#/hr)			11			17	6		1	1		6
Confl. Bikes (#/hr)			9			1			1			4
Heavy Vehicles (%)	1%	2%	1%	1%	2%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8			4		4
Actuated Green, G (s)	9.2	66.3		7.8	64.9	64.9	13.9	13.9		13.9	13.9	13.9
Effective Green, g (s)	9.2	66.3		7.8	64.9	64.9	13.9	13.9		13.9	13.9	13.9
Actuated g/C Ratio	0.09	0.66		0.08	0.65	0.65	0.14	0.14		0.14	0.14	0.14
Clearance Time (s)	3.5	5.0		3.5	5.0	5.0	3.5	3.5		3.5	3.5	3.5
Vehicle Extension (s)	2.0	5.0		2.0	5.0	5.0	2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	164	1224		139	1209	988	145	249		119	261	212
v/s Ratio Prot	c0.06	c0.47		0.04	0.26			0.07			0.06	
v/s Ratio Perm						0.07	0.04			c0.09		0.00
v/c Ratio	0.62	0.71		0.47	0.40	0.11	0.28	0.54		0.65	0.44	0.03
Uniform Delay, d1	43.7	10.8		44.1	8.4	6.6	38.6	40.1		40.7	39.5	37.2
Progression Factor	0.87	1.05		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	3.8	2.6		0.9	1.0	0.2	0.4	1.1		8.7	0.4	0.0
Delay (s)	41.8	13.9		45.1	9.4	6.9	39.0	41.2		49.5	39.9	37.3
Level of Service	D	B		D	A	A	D	D		D	D	D
Approach Delay (s)		16.8			12.3			40.7			42.4	
Approach LOS		B			B			D			D	

Intersection Summary				
HCM 2000 Control Delay	20.5	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.70			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	82.0%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
14: Novato Blvd & Diablo Ave

01/23/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	244	37	200	245	324	36	308	212	474	421	28
Future Volume (vph)	22	244	37	200	245	324	36	308	212	474	421	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	11	11	12	11	11	12	12	12	12
Total Lost time (s)		3.7		4.1	4.1	4.1	4.4	4.4	4.4	4.1	4.1	
Lane Util. Factor		0.95		0.91	0.91	1.00	1.00	1.00	1.00	0.91	0.91	
Frpb, ped/bikes		1.00		1.00	1.00	0.95	1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes		1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt		0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected		1.00		0.95	0.99	1.00	0.95	1.00	1.00	0.95	0.99	
Satd. Flow (prot)		3487		1557	3273	1510	1728	1801	1556	1610	3320	
Flt Permitted		1.00		0.95	0.99	1.00	0.95	1.00	1.00	0.95	0.99	
Satd. Flow (perm)		3487		1557	3273	1510	1728	1801	1556	1610	3320	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	22	249	38	204	250	331	37	314	216	484	430	29
RTOR Reduction (vph)	0	8	0	0	0	216	0	0	167	0	2	0
Lane Group Flow (vph)	0	301	0	147	307	115	37	314	49	310	631	0
Confl. Peds. (#/hr)			7			15			2			4
Confl. Bikes (#/hr)			1			1			3			5
Heavy Vehicles (%)	1%	1%	1%	2%	1%	2%	1%	2%	2%	2%	2%	1%
Turn Type	Split	NA		Split	NA	Perm	Split	NA	Perm	Split	NA	
Protected Phases	3	3		4	4		1	1		2	2	
Permitted Phases						4			1		2	
Actuated Green, G (s)		14.6		15.3	15.3	15.3	21.0	21.0	21.0	24.5	24.5	
Effective Green, g (s)		14.6		15.3	15.3	15.3	21.0	21.0	21.0	24.5	24.5	
Actuated g/C Ratio		0.16		0.17	0.17	0.17	0.23	0.23	0.23	0.27	0.27	
Clearance Time (s)		3.7		4.1	4.1	4.1	4.4	4.4	4.4	4.1	4.1	
Vehicle Extension (s)		2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)		555		259	546	251	395	412	356	430	887	
v/s Ratio Prot		c0.09		c0.09	0.09		0.02	c0.17		c0.19	0.19	
v/s Ratio Perm						0.08			0.03			
v/c Ratio		0.54		0.57	0.56	0.46	0.09	0.76	0.14	0.72	0.71	
Uniform Delay, d1		35.5		35.2	35.1	34.5	27.9	33.0	28.2	30.5	30.4	
Progression Factor		1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		0.6		1.7	0.8	0.5	0.0	7.3	0.1	5.0	2.3	
Delay (s)		36.1		36.9	35.9	35.0	27.9	40.4	28.2	35.5	32.7	
Level of Service		D		D	D	C	C	D	C	D	C	
Approach Delay (s)		36.1			35.7			34.9			33.6	
Approach LOS		D			D			C			C	

Intersection Summary				
HCM 2000 Control Delay	34.8	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.67			
Actuated Cycle Length (s)	91.7	Sum of lost time (s)	16.3	
Intersection Capacity Utilization	73.6%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
14: Diablo Ave & Novato Blvd

02/12/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	244	37	200	245	324	36	308	212	474	421	28
Future Volume (vph)	22	244	37	200	245	324	36	308	212	474	421	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	12	11	11	12	10	12	12
Total Lost time (s)	4.0	4.1	4.1	4.0	4.0	4.0	4.0	4.1		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		0.97	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	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		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.94		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1728	1818	1518	1711	1818	1558	1728	3190		3204	1843	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1728	1818	1518	1711	1818	1558	1728	3190		3204	1843	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	22	249	38	204	250	331	37	314	216	484	430	29
RTOR Reduction (vph)	0	0	29	0	0	135	0	124	0	0	2	0
Lane Group Flow (vph)	22	249	9	204	250	196	37	406	0	484	457	0
Confl. Peds. (#/hr)			7			15			2			4
Confl. Bikes (#/hr)			1			1			3			5
Heavy Vehicles (%)	1%	1%	1%	2%	1%	2%	1%	2%	2%	2%	2%	1%
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	1.7	19.5	19.5	13.5	31.4	48.0	3.3	18.3		16.6	31.7	
Effective Green, g (s)	1.7	19.5	19.5	13.5	31.4	48.0	3.3	18.3		16.6	31.7	
Actuated g/C Ratio	0.02	0.23	0.23	0.16	0.37	0.57	0.04	0.22		0.20	0.38	
Clearance Time (s)	4.0	4.1	4.1	4.0	4.0	4.0	4.0	4.1		4.0	4.0	
Vehicle Extension (s)	3.0	2.0	2.0	3.0	3.0	3.0	3.0	2.0		3.0	3.0	
Lane Grp Cap (vph)	34	421	351	274	678	963	67	694		632	694	
v/s Ratio Prot	0.01	c0.14		c0.12	0.14	0.04	0.02	0.13		c0.15	c0.25	
v/s Ratio Perm			0.01			0.09						
v/c Ratio	0.65	0.59	0.03	0.74	0.37	0.20	0.55	0.59		0.77	0.66	
Uniform Delay, d1	40.9	28.8	25.0	33.7	19.1	8.8	39.7	29.5		31.9	21.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	35.3	1.5	0.0	10.5	0.3	0.1	9.5	0.8		5.5	2.3	
Delay (s)	76.2	30.2	25.0	44.1	19.5	8.9	49.2	30.3		37.4	24.0	
Level of Service	E	C	C	D	B	A	D	C		D	C	
Approach Delay (s)		32.9			21.4			31.5			30.9	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM 2000 Control Delay	28.4	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.71			
Actuated Cycle Length (s)	84.1	Sum of lost time (s)	16.2	
Intersection Capacity Utilization	70.2%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
15: Redwood Blvd & Diablo Ave/De Long Ave

06/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	234	489	168	156	574	213	54	143	31	204	276	171
Future Volume (vph)	234	489	168	156	574	213	54	143	31	204	276	171
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	9
Total Lost time (s)	5.0	4.0		5.0	4.1		4.0	4.8	4.8	4.0	4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95	1.00	0.97	1.00	1.00
Frpb, ped/bikes	1.00	0.99		1.00	0.99		1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3467	3454		1805	3351		1805	3610	1505	3303	1900	1408
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3467	3454		1805	3351		1805	3610	1505	3303	1900	1408
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	254	532	183	170	624	232	59	155	34	222	300	186
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	15	0	0	58
Lane Group Flow (vph)	254	715	0	170	856	0	59	155	19	222	300	128
Confl. Peds. (#/hr)			5			5			5			5
Confl. Bikes (#/hr)			5			5			5			5
Heavy Vehicles (%)	1%	0%	0%	0%	2%	5%	0%	0%	5%	6%	0%	1%
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)	17.0	48.2		17.0	48.1		10.4	36.0	36.0	11.0	37.4	37.4
Effective Green, g (s)	17.0	48.2		17.0	48.1		10.4	36.0	36.0	11.0	37.4	37.4
Actuated g/C Ratio	0.13	0.37		0.13	0.37		0.08	0.28	0.28	0.08	0.29	0.29
Clearance Time (s)	5.0	4.0		5.0	4.1		4.0	4.8	4.8	4.0	4.0	4.0
Vehicle Extension (s)	2.5	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	453	1280		236	1239		144	999	416	279	546	405
v/s Ratio Prot	0.07	0.21		c0.09	c0.26		0.03	0.04		c0.07	c0.16	
v/s Ratio Perm									0.01			0.09
v/c Ratio	0.56	0.56		0.72	0.69		0.41	0.16	0.05	0.80	0.55	0.32
Uniform Delay, d1	53.0	32.5		54.2	34.7		56.9	35.5	34.4	58.4	39.2	36.3
Progression Factor	1.00	1.00		1.12	0.88		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.3	1.8		7.7	2.7		0.7	0.3	0.2	13.6	3.9	2.0
Delay (s)	54.3	34.2		68.5	33.3		57.6	35.8	34.6	72.0	43.1	38.3
Level of Service	D	C		E	C		E	D	C	E	D	D
Approach Delay (s)		39.5			39.2			40.8			50.9	
Approach LOS		D			D			D			D	

Intersection Summary				
HCM 2000 Control Delay	42.2	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.67			
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	17.9	
Intersection Capacity Utilization	103.4%	ICU Level of Service	G	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
16: Reichert Ave & De Long Ave

06/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	71	664	14	66	949	208	13	22	40	190	37	78
Future Volume (vph)	71	664	14	66	949	208	13	22	40	190	37	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.1		3.0	4.1		3.5	3.5	3.5	3.5	3.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00	0.98	1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00	1.00	0.99	1.00	
Frt	1.00	1.00		1.00	0.97		1.00	1.00	0.85	1.00	0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1805	3527		1805	3459		1793	1900	1578	1778	1676	
Flt Permitted	0.95	1.00		0.95	1.00		0.55	1.00	1.00	0.74	1.00	
Satd. Flow (perm)	1805	3527		1805	3459		1039	1900	1578	1388	1676	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	79	738	16	73	1054	231	14	24	44	211	41	87
RTOR Reduction (vph)	0	0	0	0	6	0	0	0	9	0	28	0
Lane Group Flow (vph)	79	754	0	73	1279	0	14	24	35	211	100	0
Confl. Peds. (#/hr)			6			3	6		4	4		6
Confl. Bikes (#/hr)			5			5			5			5
Heavy Vehicles (%)	0%	2%	0%	0%	1%	1%	0%	0%	0%	1%	0%	0%
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	9.0	86.0		8.7	85.7		24.7	24.7	24.7	24.7	24.7	
Effective Green, g (s)	9.0	86.0		8.7	85.7		24.7	24.7	24.7	24.7	24.7	
Actuated g/C Ratio	0.07	0.66		0.07	0.66		0.19	0.19	0.19	0.19	0.19	
Clearance Time (s)	3.0	4.1		3.0	4.1		3.5	3.5	3.5	3.5	3.5	
Vehicle Extension (s)	2.0	3.0		2.0	3.0		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	124	2333		120	2280		197	361	299	263	318	
v/s Ratio Prot	c0.04	0.21		0.04	c0.37			0.01			0.06	
v/s Ratio Perm							0.01		0.02	c0.15		
v/c Ratio	0.64	0.32		0.61	0.56		0.07	0.07	0.12	0.80	0.32	
Uniform Delay, d1	58.9	9.5		59.0	12.0		43.2	43.2	43.6	50.3	45.4	
Progression Factor	1.01	1.12		1.09	0.97		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	6.4	0.3		5.5	0.9		0.1	0.0	0.1	15.2	0.2	
Delay (s)	65.7	10.9		69.7	12.6		43.3	43.2	43.7	65.5	45.6	
Level of Service	E	B		E	B		D	D	D	E	D	
Approach Delay (s)		16.1			15.7			43.5			58.0	
Approach LOS		B			B			D			E	

Intersection Summary				
HCM 2000 Control Delay	22.2	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.62			
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	10.6	
Intersection Capacity Utilization	68.7%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
17: US 101 SB Ramps & De Long Ave

06/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	194	669	20	840	0	0	0	0	12	2	313
Future Volume (vph)	0	194	669	20	840	0	0	0	0	12	2	313
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.6	3.6	3.0	3.6					4.0	4.0	
Lane Util. Factor		0.95	1.00	1.00	0.95					0.95	0.95	
Frt		1.00	0.85	1.00	1.00					1.00	0.85	
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (prot)		3574	1599	1770	3539					1681	1506	
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (perm)		3574	1599	1770	3539					1681	1506	
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)	0	206	712	21	894	0	0	0	0	13	2	333
RTOR Reduction (vph)	0	0	280	0	0	0	0	0	0	0	111	0
Lane Group Flow (vph)	0	206	432	21	894	0	0	0	0	12	225	0
Heavy Vehicles (%)	0%	1%	1%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type		NA	Perm	Prot	NA					Split	NA	
Protected Phases		6		5	2					4	4	
Permitted Phases			6									
Actuated Green, G (s)		39.4	39.4	1.4	43.8					13.6	13.6	
Effective Green, g (s)		39.4	39.4	1.4	43.8					13.6	13.6	
Actuated g/C Ratio		0.61	0.61	0.02	0.67					0.21	0.21	
Clearance Time (s)		3.6	3.6	3.0	3.6					4.0	4.0	
Vehicle Extension (s)		4.0	4.0	2.0	4.0					2.5	2.5	
Lane Grp Cap (vph)		2166	969	38	2384					351	315	
v/s Ratio Prot		0.06		c0.01	0.25					0.01	c0.15	
v/s Ratio Perm			c0.27									
v/c Ratio		0.10	0.45	0.55	0.38					0.03	0.71	
Uniform Delay, d1		5.3	6.9	31.5	4.6					20.5	23.9	
Progression Factor		1.00	6.33	1.00	1.00					1.00	1.00	
Incremental Delay, d2		0.1	1.4	9.5	0.5					0.0	6.9	
Delay (s)		5.5	45.1	41.0	5.1					20.5	30.8	
Level of Service		A	D	D	A					C	C	
Approach Delay (s)		36.2			5.9			0.0			30.5	
Approach LOS		D			A			A			C	

Intersection Summary				
HCM 2000 Control Delay	22.6	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.51			
Actuated Cycle Length (s)	65.0	Sum of lost time (s)	10.6	
Intersection Capacity Utilization	64.8%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
18: US 101 NB Ramps & De Long Ave

06/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	173	34	0	1	58	9	803	2	18	0	0	0
Future Volume (vph)	173	34	0	1	58	9	803	2	18	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.6			3.6		4.5	4.5				
Lane Util. Factor	1.00	0.95			0.95		0.95	0.95				
Frt	1.00	1.00			0.98		1.00	0.99				
Flt Protected	0.95	1.00			1.00		0.95	0.95				
Satd. Flow (prot)	1770	3610			3478		1698	1689				
Flt Permitted	0.95	1.00			0.95		0.95	0.95				
Satd. Flow (perm)	1770	3610			3310		1698	1689				
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	188	37	0	1	63	10	873	2	20	0	0	0
RTOR Reduction (vph)	0	0	0	0	9	0	0	2	0	0	0	0
Lane Group Flow (vph)	188	37	0	0	65	0	445	448	0	0	0	0
Heavy Vehicles (%)	2%	0%	0%	0%	0%	12%	1%	0%	8%	0%	0%	0%
Turn Type	Prot	NA			NA		Split	NA				
Protected Phases	1	6			2		4	4				
Permitted Phases												
Actuated Green, G (s)	8.8	16.8			4.5		20.4	20.4				
Effective Green, g (s)	8.8	16.8			4.5		20.4	20.4				
Actuated g/C Ratio	0.19	0.37			0.10		0.45	0.45				
Clearance Time (s)	3.5	3.6			3.6		4.5	4.5				
Vehicle Extension (s)	2.5	2.0			2.0		3.0	3.0				
Lane Grp Cap (vph)	343	1338			328		764	760				
v/s Ratio Prot	c0.11	0.01					0.26	c0.27				
v/s Ratio Perm					c0.02							
v/c Ratio	0.55	0.03			1.00dr		0.58	0.59				
Uniform Delay, d1	16.5	9.1			18.7		9.3	9.3				
Progression Factor	1.00	1.00			1.00		1.00	1.00				
Incremental Delay, d2	1.4	0.0			0.1		1.1	1.2				
Delay (s)	17.9	9.1			18.9		10.4	10.5				
Level of Service	B	A			B		B	B				
Approach Delay (s)		16.4			18.9			10.5			0.0	
Approach LOS		B			B			B			A	

Intersection Summary				
HCM 2000 Control Delay	12.1	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.53			
Actuated Cycle Length (s)	45.3	Sum of lost time (s)	11.6	
Intersection Capacity Utilization	46.2%	ICU Level of Service	A	
Analysis Period (min)	15			

dr Defacto Right Lane. Recode with 1 though lane as a right lane.
c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
19: Redwood Blvd & Lamont Ave 06/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	2	8	105	2	51	17	269	41	65	496	29
Future Volume (vph)	11	2	8	105	2	51	17	269	41	65	496	29
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	3.5		3.5	3.5	3.5	4.8		3.5	4.8	4.8
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes		1.00	1.00		1.00	0.99	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85		1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected		0.96	1.00		0.95	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1821	1615		1811	1595	1805	3527		1805	3610	1615
Flt Permitted		0.84	1.00		0.74	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1588	1615		1399	1595	1805	3527		1805	3610	1615
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	12	2	9	114	2	55	18	292	45	71	539	32
RTOR Reduction (vph)	0	0	7	0	0	40	0	12	0	0	0	18
Lane Group Flow (vph)	0	14	2	0	116	15	18	325	0	71	539	14
Confl. Peds. (#/hr)	1					1			2			
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8		8	4		4						2
Actuated Green, G (s)		12.7	12.7		12.7	12.7	0.9	18.8		3.1	21.0	21.0
Effective Green, g (s)		12.7	12.7		12.7	12.7	0.9	18.8		3.1	21.0	21.0
Actuated g/C Ratio		0.27	0.27		0.27	0.27	0.02	0.41		0.07	0.45	0.45
Clearance Time (s)		3.5	3.5		3.5	3.5	3.5	4.8		3.5	4.8	4.8
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0	3.0		2.0	3.0	3.0
Lane Grp Cap (vph)		434	442		382	436	35	1429		120	1633	730
v/s Ratio Prot							0.01	0.09		c0.04	c0.15	
v/s Ratio Perm		0.01	0.00		c0.08	0.01						0.01
v/c Ratio		0.03	0.01		0.30	0.03	0.51	0.23		0.59	0.33	0.02
Uniform Delay, d1		12.3	12.3		13.3	12.4	22.5	9.0		21.0	8.2	7.0
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		0.0	0.0		0.2	0.0	5.2	0.1		5.1	0.1	0.0
Delay (s)		12.4	12.3		13.5	12.4	27.7	9.1		26.2	8.3	7.0
Level of Service		B	B		B	B	C	A		C	A	A
Approach Delay (s)		12.3			13.1			10.1			10.2	
Approach LOS		B			B			B			B	

Intersection Summary				
HCM 2000 Control Delay	10.6	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.34			
Actuated Cycle Length (s)	46.4	Sum of lost time (s)	11.8	
Intersection Capacity Utilization	45.1%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
20: Redwood Blvd & Landing Ct 06/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	0	1	25	0	12	1	312	32	25	485	1
Future Volume (vph)	2	0	1	25	0	12	1	312	32	25	485	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5		3.5		3.5		4.8	4.8	3.5	4.8	4.8
Lane Util. Factor		1.00		1.00		1.00		0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes		1.00		1.00		1.00		1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes		1.00		1.00		1.00		1.00	1.00	1.00	1.00	1.00
Frt		0.95		1.00		0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected		0.97		0.95		1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1748		1803		1615		3609	1579	1805	3610	1572
Flt Permitted		0.97		0.76		1.00		0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1748		1434		1615		3444	1579	1805	3610	1572
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	2	0	1	27	0	13	1	339	35	27	527	1
RTOR Reduction (vph)	0	3	0	0	0	11	0	0	14	0	0	0
Lane Group Flow (vph)	0	0	0	27	0	2	0	340	21	27	527	1
Confl. Peds. (#/hr)			4	4					3			6
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA		Perm		Perm	Perm	NA	Perm	Prot	NA	Perm
Protected Phases		4						2		1	6	
Permitted Phases	4			8		8	2		2			6
Actuated Green, G (s)		5.5		5.5		5.5		26.1	26.1	0.8	30.4	30.4
Effective Green, g (s)		5.5		5.5		5.5		26.1	26.1	0.8	30.4	30.4
Actuated g/C Ratio		0.12		0.12		0.12		0.59	0.59	0.02	0.69	0.69
Clearance Time (s)		3.5		3.5		3.5		4.8	4.8	3.5	4.8	4.8
Vehicle Extension (s)		3.0		2.0		2.0		4.0	4.0	2.0	4.0	4.0
Lane Grp Cap (vph)		217		178		200		2033	932	32	2482	1081
v/s Ratio Prot										c0.01	c0.15	
v/s Ratio Perm		0.00		c0.02		0.00		0.10	0.01			0.00
v/c Ratio		0.00		0.15		0.01		0.17	0.02	0.84	0.21	0.00
Uniform Delay, d1		16.9		17.3		17.0		4.1	3.8	21.6	2.5	2.2
Progression Factor		1.00		1.00		1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.0		0.1		0.0		0.1	0.0	93.1	0.1	0.0
Delay (s)		16.9		17.4		17.0		4.2	3.8	114.7	2.6	2.2
Level of Service		B		B		B		A	A	F	A	A
Approach Delay (s)		16.9			17.3			4.1			8.0	
Approach LOS		B			B			A			A	

Intersection Summary				
HCM 2000 Control Delay	6.9	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.23			
Actuated Cycle Length (s)	44.2	Sum of lost time (s)	11.8	
Intersection Capacity Utilization	40.6%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
21: Novato Blvd & Center Rd/Garden Ct

06/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	57	0	302	3	0	3	123	473	4	1	694	69
Future Volume (vph)	57	0	302	3	0	3	123	473	4	1	694	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.2	3.2			3.0		3.0	4.4		3.0	4.4	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.85			0.93		1.00	1.00		1.00	0.99	
Flt Protected	0.95	1.00			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1615			1729		1805	3605		1805	3518	
Flt Permitted	0.75	1.00			0.59		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1432	1615			1050		1805	3605		1805	3518	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	62	0	328	3	0	3	134	514	4	1	754	75
RTOR Reduction (vph)	0	290	0	0	5	0	0	0	0	0	4	0
Lane Group Flow (vph)	62	38	0	0	1	0	134	518	0	1	825	0
Confl. Peds. (#/hr)									9			6
Confl. Bikes (#/hr)									2			
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4								
Actuated Green, G (s)	11.6	11.6			11.8		12.4	75.6		2.2	65.4	
Effective Green, g (s)	11.6	11.6			11.8		12.4	75.6		2.2	65.4	
Actuated g/C Ratio	0.12	0.12			0.12		0.12	0.76		0.02	0.65	
Clearance Time (s)	3.2	3.2			3.0		3.0	4.4		3.0	4.4	
Vehicle Extension (s)	3.0	3.0			2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	166	187			123		223	2725		39	2300	
v/s Ratio Prot		0.02					c0.07	0.14		0.00	c0.23	
v/s Ratio Perm	c0.04				0.00							
v/c Ratio	0.37	0.20			0.01		0.60	0.19		0.03	0.36	
Uniform Delay, d1	40.8	40.0			38.9		41.5	3.5		47.9	7.8	
Progression Factor	1.00	1.00			1.00		0.68	1.38		1.00	1.00	
Incremental Delay, d2	1.4	0.5			0.0		3.1	0.2		0.1	0.4	
Delay (s)	42.3	40.6			38.9		31.2	4.9		47.9	8.3	
Level of Service	D	D			D		C	A		D	A	
Approach Delay (s)		40.8			38.9			10.3			8.3	
Approach LOS		D			D			B			A	

Intersection Summary				
HCM 2000 Control Delay	15.9	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.39			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.6	
Intersection Capacity Utilization	58.8%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
22: Novato Blvd & Arthur St

06/13/2017

Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	162	129	229	511	18	867	186
Future Volume (vph)	162	129	229	511	18	867	186
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5	3.5	4.9	3.5	4.9	
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	0.95	
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	0.99	
Flpb, ped/bikes	0.99	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	1.00	0.97	
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1785	1579	1805	3610	1805	3467	
Flt Permitted	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (perm)	1785	1579	1805	3610	1805	3467	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	176	140	249	555	20	942	202
RTOR Reduction (vph)	0	118	0	0	0	13	0
Lane Group Flow (vph)	176	22	249	555	20	1131	0
Confl. Peds. (#/hr)	10	8					5
Confl. Bikes (#/hr)		1					
Heavy Vehicles (%)	0%	0%	0%	0%	0%	1%	0%
Turn Type	Perm	Perm	Prot	NA	Prot	NA	
Protected Phases			1	6	5	2	
Permitted Phases	4	4					
Actuated Green, G (s)	15.7	15.7	17.8	69.7	2.7	54.6	
Effective Green, g (s)	15.7	15.7	17.8	69.7	2.7	54.6	
Actuated g/C Ratio	0.16	0.16	0.18	0.70	0.03	0.55	
Clearance Time (s)	3.5	3.5	3.5	4.9	3.5	4.9	
Vehicle Extension (s)	2.0	2.0	2.0	4.0	2.0	4.0	
Lane Grp Cap (vph)	280	247	321	2516	48	1892	
v/s Ratio Prot			c0.14	0.15	0.01	c0.33	
v/s Ratio Perm	c0.10	0.01					
v/c Ratio	0.63	0.09	0.78	0.22	0.42	0.60	
Uniform Delay, d1	39.4	36.0	39.2	5.4	47.9	15.3	
Progression Factor	1.00	1.00	0.81	1.12	1.39	0.74	
Incremental Delay, d2	3.2	0.1	8.5	0.2	2.0	1.3	
Delay (s)	42.6	36.1	40.1	6.2	68.5	12.6	
Level of Service	D	D	D	A	E	B	
Approach Delay (s)	39.7			16.7		13.6	
Approach LOS	D			B		B	

Intersection Summary				
HCM 2000 Control Delay	18.3	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.64			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.9	
Intersection Capacity Utilization	65.6%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
23: Novato Blvd & Rowland Blvd

06/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	140	16	355	321	347	45	305	221	405	420	187
Future Volume (vph)	45	140	16	355	321	347	45	305	221	405	420	187
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5		3.5	4.1	4.1	3.5	4.1		3.5	4.4	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		0.97	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	0.99	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	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.94		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1857		1770	1900	1576	1805	1745		3502	1790	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1805	1857		1770	1900	1576	1805	1745		3502	1790	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	47	147	17	374	338	365	47	321	233	426	442	197
RTOR Reduction (vph)	0	5	0	0	0	254	0	25	0	0	13	0
Lane Group Flow (vph)	47	159	0	374	338	111	47	529	0	426	626	0
Confl. Peds. (#/hr)			24			2			13			10
Confl. Bikes (#/hr)			1						1			
Heavy Vehicles (%)	0%	0%	0%	2%	0%	1%	0%	0%	2%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases						4						
Actuated Green, G (s)	5.4	18.0		18.5	30.5	30.5	6.0	33.0		15.9	42.6	
Effective Green, g (s)	5.4	18.0		18.5	30.5	30.5	6.0	33.0		15.9	42.6	
Actuated g/C Ratio	0.05	0.18		0.18	0.30	0.30	0.06	0.33		0.16	0.43	
Clearance Time (s)	3.5	3.5		3.5	4.1	4.1	3.5	4.1		3.5	4.4	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	2.0	2.0	3.0		2.0	2.0	
Lane Grp Cap (vph)	97	334		327	579	480	108	575		556	762	
v/s Ratio Prot	0.03	0.09		c0.21	c0.18		0.03	c0.30		c0.12	0.35	
v/s Ratio Perm						0.07						
v/c Ratio	0.48	0.48		1.14	0.58	0.23	0.44	0.92		0.77	0.82	
Uniform Delay, d1	45.9	36.8		40.8	29.4	26.0	45.4	32.2		40.3	25.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.39	0.61	
Incremental Delay, d2	1.4	0.4		94.6	1.0	0.1	1.0	22.1		4.8	8.3	
Delay (s)	47.3	37.2		135.4	30.4	26.1	46.4	54.4		60.6	23.8	
Level of Service	D	D		F	C	C	D	D		E	C	
Approach Delay (s)		39.4			65.4			53.7			38.5	
Approach LOS		D			E			D			D	

Intersection Summary						
HCM 2000 Control Delay	51.5	HCM 2000 Level of Service		D		
HCM 2000 Volume to Capacity ratio	0.89					
Actuated Cycle Length (s)	100.0	Sum of lost time (s)		15.5		
Intersection Capacity Utilization	90.8%	ICU Level of Service		E		
Analysis Period (min)	15					
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis
24: Redwood Blvd & Rowland Blvd

06/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	115	694	49	21	794	287	72	23	81	299	19	301
Future Volume (vph)	115	694	49	21	794	287	72	23	81	299	19	301
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.4	4.4	3.5	3.7	3.7	3.5	4.1		3.5	4.8	4.8
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95		0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.99	1.00	0.99		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		1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.88		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1805	3574	1589	1805	3574	1578	1805	3150		3502	1900	1593
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1805	3574	1589	1805	3574	1578	1805	3150		3502	1900	1593
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	125	754	53	23	863	312	78	25	88	325	21	327
RTOR Reduction (vph)	0	0	28	0	0	77	0	76	0	0	0	245
Lane Group Flow (vph)	125	754	25	23	863	235	78	37	0	325	21	82
Confl. Peds. (#/hr)			6			2			3			2
Confl. Bikes (#/hr)									1			
Heavy Vehicles (%)	0%	1%	0%	0%	1%	1%	0%	0%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2			6						4
Actuated Green, G (s)	11.2	38.4	38.4	3.0	30.9	30.9	8.0	10.7		12.6	14.6	14.6
Effective Green, g (s)	11.2	38.4	38.4	3.0	30.9	30.9	8.0	10.7		12.6	14.6	14.6
Actuated g/C Ratio	0.14	0.48	0.48	0.04	0.39	0.39	0.10	0.13		0.16	0.18	0.18
Clearance Time (s)	3.5	4.4	4.4	3.5	3.7	3.7	3.5	4.1		3.5	4.8	4.8
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	2.0	2.5		2.5	2.5	2.5
Lane Grp Cap (vph)	252	1711	760	67	1377	607	180	420		550	345	289
v/s Ratio Prot	c0.07	0.21		0.01	c0.24		0.04	0.01		c0.09	0.01	
v/s Ratio Perm			0.02			0.15						c0.05
v/c Ratio	0.50	0.44	0.03	0.34	0.63	0.39	0.43	0.09		0.59	0.06	0.29
Uniform Delay, d1	31.9	13.8	11.1	37.6	20.0	17.8	34.0	30.5		31.4	27.1	28.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	0.6	0.2	0.0	1.1	1.0	0.6	0.6	0.1		1.4	0.1	0.4
Delay (s)	32.5	14.1	11.1	38.8	21.0	18.4	34.6	30.5		32.8	27.2	28.7
Level of Service	C	B	B	D	C	B	C	C		C	C	C
Approach Delay (s)		16.4			20.7			32.2			30.6	
Approach LOS		B			C			C			C	

Intersection Summary						
HCM 2000 Control Delay	22.3	HCM 2000 Level of Service		C		
HCM 2000 Volume to Capacity ratio	0.56					
Actuated Cycle Length (s)	80.2	Sum of lost time (s)		16.2		
Intersection Capacity Utilization	60.9%	ICU Level of Service		B		
Analysis Period (min)	15					
c Critical Lane Group						

HCM Signalized Intersection Capacity Analysis
25: US 101 SB Ramps & Rowland Blvd

06/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	576	467	136	652	0	0	0	0	273	49	489
Future Volume (vph)	0	576	467	136	652	0	0	0	0	273	49	489
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.6	3.6	3.0	3.6					3.0	3.0	
Lane Util. Factor		0.91	0.91	0.97	0.95					0.91	0.91	
Frpb, ped/bikes		1.00	0.99	1.00	1.00					1.00	0.99	
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	
Frt		0.97	0.85	1.00	1.00					1.00	0.87	
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (prot)		3315	1450	3367	3574					1643	2844	
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (perm)		3315	1450	3367	3574					1643	2844	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	626	508	148	709	0	0	0	0	297	53	532
RTOR Reduction (vph)	0	27	209	0	0	0	0	0	0	0	73	0
Lane Group Flow (vph)	0	762	136	148	709	0	0	0	0	267	542	0
Confl. Peds. (#/hr)			2									2
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	0%	1%	0%	4%	1%	0%	0%	0%	0%	0%	40%	1%
Turn Type		NA	Perm	Prot	NA					Split	NA	
Protected Phases		2		1	6					4	4	
Permitted Phases			2									
Actuated Green, G (s)		19.0	19.0	3.8	25.8					15.8	15.8	
Effective Green, g (s)		19.0	19.0	3.8	25.8					15.8	15.8	
Actuated g/C Ratio		0.39	0.39	0.08	0.54					0.33	0.33	
Clearance Time (s)		3.6	3.6	3.0	3.6					3.0	3.0	
Vehicle Extension (s)		4.0	4.0	2.0	2.5					2.0	2.0	
Lane Grp Cap (vph)		1306	571	265	1913					538	932	
v/s Ratio Prot		c0.23		c0.04	0.20					0.16	c0.19	
v/s Ratio Perm			0.09									
v/c Ratio		0.58	0.24	0.56	0.37					0.50	0.94dr	
Uniform Delay, d1		11.5	9.8	21.4	6.5					13.0	13.5	
Progression Factor		1.00	1.00	1.00	1.00					1.00	1.00	
Incremental Delay, d2		0.8	0.3	1.5	0.1					0.3	0.6	
Delay (s)		12.3	10.1	22.8	6.6					13.3	14.1	
Level of Service		B	B	C	A					B	B	
Approach Delay (s)		11.6			9.4			0.0			13.8	
Approach LOS		B			A			A			B	

Intersection Summary				
HCM 2000 Control Delay	11.6	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.58			
Actuated Cycle Length (s)	48.2	Sum of lost time (s)	9.6	
Intersection Capacity Utilization	52.5%	ICU Level of Service	A	
Analysis Period (min)	15			

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
26: US 101 NB Ramps & Rowland Blvd

06/13/2017

Movement	EBL2	EBL	EBT	WBT	WBR	WBR2	NBL2	NBL	NBT	NBR	NEL2	NEL
Lane Configurations												
Traffic Volume (vph)	28	243	607	312	2	144	485	8	9	426	13	4
Future Volume (vph)	28	243	607	312	2	144	485	8	9	426	13	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	3.6	3.6		3.6	3.5		3.5	3.0		3.5
Lane Util. Factor		1.00	0.95	0.86		0.86	0.95		0.95	0.88		1.00
Frpb, ped/bikes		1.00	1.00	1.00		1.00	1.00		1.00	1.00		1.00
Flpb, ped/bikes		1.00	1.00	1.00		1.00	1.00		1.00	1.00		1.00
Frt		1.00	1.00	0.98		0.85	1.00		1.00	0.85		0.99
Flt Protected		0.95	1.00	1.00		1.00	0.95		0.95	1.00		0.96
Satd. Flow (prot)		1805	3574	4621		1323	1715		1681	2787		1794
Flt Permitted		0.95	1.00	1.00		1.00	0.95		0.95	1.00		0.96
Satd. Flow (perm)		1805	3574	4621		1323	1715		1681	2787		1794
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	30	264	660	339	2	157	527	9	10	463	14	4
RTOR Reduction (vph)	0	0	0	14	0	87	0	0	0	0	0	0
Lane Group Flow (vph)	0	294	660	373	0	24	274	0	272	463	0	20
Confl. Peds. (#/hr)										2		
Heavy Vehicles (%)	0%	0%	1%	4%	0%	5%	0%	0%	67%	2%	0%	0%
Turn Type	Prot	Prot	NA	NA		Perm	Split	Split	NA	custom	Perm	Prot
Protected Phases	5	5	2	6			8	8	8	1 8		7
Permitted Phases						6					7	
Actuated Green, G (s)		16.4	18.0	14.1		14.1	16.9		16.9	32.9		3.1
Effective Green, g (s)		16.4	18.0	14.1		14.1	16.9		16.9	29.4		3.1
Actuated g/C Ratio		0.26	0.28	0.22		0.22	0.26		0.26	0.46		0.05
Clearance Time (s)		3.0	3.6	3.6		3.6	3.5		3.5			3.5
Vehicle Extension (s)		2.0	2.0	2.0		2.0	2.0		2.0			2.0
Lane Grp Cap (vph)		461	1003	1016		291	452		443	1278		86
v/s Ratio Prot		0.16	c0.18	c0.08			0.16		c0.16	0.17		
v/s Ratio Perm						0.02						0.01
v/c Ratio		0.64	0.66	0.37		0.08	0.61		0.61	0.36		0.23
Uniform Delay, d1		21.2	20.3	21.2		19.9	20.7		20.7	11.3		29.4
Progression Factor		1.00	1.00	1.00		1.00	1.00		1.00	1.00		1.00
Incremental Delay, d2		2.1	1.2	0.1		0.0	1.6		1.8	0.1		0.5
Delay (s)		23.3	21.5	21.3		19.9	22.3		22.5	11.3		29.9
Level of Service		C	C	C		B	C		C	B		C
Approach Delay (s)			22.1	21.0					17.3			29.9
Approach LOS			C	C					B			C

Intersection Summary				
HCM 2000 Control Delay	20.0	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.55			
Actuated Cycle Length (s)	64.1	Sum of lost time (s)	13.6	
Intersection Capacity Utilization	62.4%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
26: US 101 NB Ramps & Rowland Blvd

06/13/2017

Movement	NER
Lane Configurations	
Traffic Volume (vph)	2
Future Volume (vph)	2
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.92
Adj. Flow (vph)	2
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	0%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

HCM Signalized Intersection Capacity Analysis
27: Rowland Blvd & Rowland Way

06/13/2017

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	421	626	366	23	13	86
Future Volume (vph)	421	626	366	23	13	86
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.6	3.2		3.2	3.2
Lane Util. Factor	0.97	0.91	0.95		1.00	0.95
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		0.89	0.85
Flt Protected	0.95	1.00	1.00		0.99	1.00
Satd. Flow (prot)	3467	5085	3397		1607	1490
Flt Permitted	0.95	1.00	1.00		0.99	1.00
Satd. Flow (perm)	3467	5085	3397		1607	1490
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	458	680	398	25	14	93
RTOR Reduction (vph)	0	0	5	0	34	46
Lane Group Flow (vph)	458	680	418	0	20	7
Confl. Peds. (#/hr)				1	2	
Heavy Vehicles (%)	1%	2%	5%	9%	6%	3%
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases						4
Actuated Green, G (s)	13.0	32.0	15.9		6.2	6.2
Effective Green, g (s)	13.0	32.0	15.9		6.2	6.2
Actuated g/C Ratio	0.29	0.71	0.35		0.14	0.14
Clearance Time (s)	3.5	3.6	3.2		3.2	3.2
Vehicle Extension (s)	2.0	4.0	4.0		2.0	2.0
Lane Grp Cap (vph)	1001	3616	1200		221	205
v/s Ratio Prot	c0.13	0.13	c0.12		c0.01	
v/s Ratio Perm						0.00
v/c Ratio	0.46	0.19	0.35		0.09	0.04
Uniform Delay, d1	13.1	2.2	10.7		16.9	16.8
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	0.1	0.0	0.2		0.1	0.0
Delay (s)	13.2	2.2	11.0		17.0	16.8
Level of Service	B	A	B		B	B
Approach Delay (s)		6.6	11.0		16.9	
Approach LOS		A	B		B	

Intersection Summary				
HCM 2000 Control Delay	8.4	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	45.0	Sum of lost time (s)	9.9
Intersection Capacity Utilization	38.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
28: Vintage Way & Rowland Blvd

06/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	7	335	300	2	242	3	130	3	0	1	2	1
Future Volume (vph)	7	335	300	2	242	3	130	3	0	1	2	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.6	3.6	3.0	3.6		3.6	3.6			3.2	
Lane Util. Factor	1.00	0.95	0.88	1.00	0.95		0.97	1.00			1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	1.00			0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1805	3195	2814	1805	3249		3367	1900			1813	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00			0.99	
Satd. Flow (perm)	1805	3195	2814	1805	3249		3367	1900			1813	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	8	364	326	2	263	3	141	3	0	1	2	1
RTOR Reduction (vph)	0	0	0	0	1	0	0	0	0	0	1	0
Lane Group Flow (vph)	8	364	326	2	265	0	141	3	0	0	3	0
Confl. Peds. (#/hr)			1			3			1			
Confl. Bikes (#/hr)			2			2						
Heavy Vehicles (%)	0%	13%	1%	0%	11%	0%	4%	0%	0%	0%	0%	0%
Turn Type	Prot	NA	pt+ov	Prot	NA		Split	NA		Split	NA	
Protected Phases	5	2	2 3	1	6		3	3		4	4	
Permitted Phases												
Actuated Green, G (s)	1.1	10.8	30.9	0.5	10.2		16.5	16.5			1.1	
Effective Green, g (s)	1.1	10.8	30.9	0.5	10.2		16.5	16.5			1.1	
Actuated g/C Ratio	0.03	0.26	0.73	0.01	0.24		0.39	0.39			0.03	
Clearance Time (s)	3.0	3.6		3.0	3.6		3.6	3.6			3.2	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		3.0	3.0			2.0	
Lane Grp Cap (vph)	46	815	2055	21	783		1313	741			47	
v/s Ratio Prot	c0.00	c0.11	c0.12	0.00	0.08		0.04	0.00			c0.00	
v/s Ratio Perm												
v/c Ratio	0.17	0.45	0.16	0.10	0.34		0.11	0.00			0.06	
Uniform Delay, d1	20.2	13.2	1.7	20.7	13.3		8.2	7.9			20.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.7	0.1	0.0	0.7	0.1		0.0	0.0			0.2	
Delay (s)	20.8	13.4	1.8	21.4	13.4		8.2	7.9			20.3	
Level of Service	C	B	A	C	B		A	A			C	
Approach Delay (s)		8.0			13.4			8.2			20.3	
Approach LOS		A			B			A			C	

Intersection Summary				
HCM 2000 Control Delay	9.4	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.28			
Actuated Cycle Length (s)	42.3	Sum of lost time (s)	13.4	
Intersection Capacity Utilization	36.0%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
29: Novato Blvd & Sunset Pkwy

06/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	242	68	26	39	102	101	25	255	56	54	336	312
Future Volume (vph)	242	68	26	39	102	101	25	255	56	54	336	312
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.0		3.5	3.5		3.5	4.9		3.5	4.6	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.99		1.00	0.97		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	0.96		1.00	0.93		1.00	0.97		1.00	0.93	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	1809		1805	1711		1805	1841		1770	1715	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1787	1809		1805	1711		1805	1841		1770	1715	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	263	74	28	42	111	110	27	277	61	59	365	339
RTOR Reduction (vph)	0	14	0	0	39	0	0	7	0	0	29	0
Lane Group Flow (vph)	263	88	0	42	182	0	27	331	0	59	675	0
Confl. Peds. (#/hr)			4			21			3			5
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	0%	0%	0%	2%	1%	2%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases												
Actuated Green, G (s)	12.8	23.0		5.7	16.4		3.4	32.6		5.7	35.2	
Effective Green, g (s)	12.8	23.0		5.7	16.4		3.4	32.6		5.7	35.2	
Actuated g/C Ratio	0.15	0.28		0.07	0.20		0.04	0.39		0.07	0.42	
Clearance Time (s)	3.5	4.0		3.5	3.5		3.5	4.9		3.5	4.6	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	275	501		124	338		74	723		121	728	
v/s Ratio Prot	c0.15	0.05		0.02	c0.11		0.01	0.18		c0.03	c0.39	
v/s Ratio Perm												
v/c Ratio	0.96	0.18		0.34	0.54		0.36	0.46		0.49	0.93	
Uniform Delay, d1	34.8	22.8		36.8	29.8		38.7	18.6		37.2	22.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	41.8	0.1		0.6	0.8		1.1	0.2		1.1	17.5	
Delay (s)	76.5	22.8		37.4	30.7		39.8	18.8		38.3	40.1	
Level of Service	E	C		D	C		D	B		D	D	
Approach Delay (s)		61.5			31.7			20.3			40.0	
Approach LOS		E			C			C			D	

Intersection Summary				
HCM 2000 Control Delay	39.1	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.83			
Actuated Cycle Length (s)	82.9	Sum of lost time (s)	15.9	
Intersection Capacity Utilization	86.3%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

Intersection	
Intersection Delay, s/veh	233.4
Intersection LOS	F

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations																
Traffic Vol, veh/h	0	49	486	386	0	327	180	28	0	94	6	71	0	99	22	67
Future Vol, veh/h	0	49	486	386	0	327	180	28	0	94	6	71	0	99	22	67
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	2	1	2	1	2	1	2	1	2	1	1	1	2	1	1	1
Mvmt Flow	0	52	512	406	0	344	189	29	0	99	6	75	0	104	23	71
Number of Lanes	0	1	1	0	0	1	1	0	0	1	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	3	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	2	2	2
HCM Control Delay	433.9	33.5	16.9	17.3
HCM LOS	F	D	C	C

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	100%	0%	0%	56%	0%	87%	0%	25%
Vol Right, %	0%	0%	100%	0%	44%	0%	13%	0%	75%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	94	6	71	49	872	327	208	99	89
LT Vol	94	0	0	49	0	327	0	99	0
Through Vol	0	6	0	0	486	0	180	0	22
RT Vol	0	0	71	0	386	0	28	0	67
Lane Flow Rate	99	6	75	52	918	344	219	104	94
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.263	0.016	0.174	0.122	1.96	0.795	0.47	0.274	0.22
Departure Headway (Hd)	11.572	11.043	10.302	8.498	7.688	9.98	9.381	11.464	10.374
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	313	326	351	424	486	365	388	316	349
Service Time	9.272	8.743	8.002	6.198	5.388	7.68	7.081	9.164	8.074
HCM Lane V/C Ratio	0.316	0.018	0.214	0.123	1.889	0.942	0.564	0.329	0.269
HCM Control Delay	18.4	13.9	15.2	12.4	457.6	42	20.1	18.4	16
HCM Lane LOS	C	B	C	B	F	E	C	C	C
HCM 95th-tile Q	1	0	0.6	0.4	61.8	6.7	2.4	1.1	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	49	486	386	327	180	28	94	6	71	99	22	67
Future Volume (vph)	49	486	386	327	180	28	94	6	71	99	22	67
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	16	12	16	16	12	12	12	12	12	12
Total Lost time (s)	3.5	4.0		3.5	4.0		3.5	4.0	4.0	3.5	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.93		1.00	0.98		1.00	1.00	0.85	1.00	0.89	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1787	1980		1787	2072		1787	1881	1599	1787	1668	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1787	1980		1787	2072		1787	1881	1599	1787	1668	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	52	512	406	344	189	29	99	6	75	104	23	71
RTOR Reduction (vph)	0	20	0	0	3	0	0	0	69	0	64	0
Lane Group Flow (vph)	52	898	0	344	215	0	99	6	6	104	30	0
Heavy Vehicles (%)	1%	2%	1%	1%	2%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	6.9	56.0		25.6	74.7		8.5	8.8	8.8	10.5	10.8	
Effective Green, g (s)	6.9	56.0		25.6	74.7		8.5	8.8	8.8	10.5	10.8	
Actuated g/C Ratio	0.06	0.48		0.22	0.64		0.07	0.08	0.08	0.09	0.09	
Clearance Time (s)	3.5	4.0		3.5	4.0		3.5	4.0	4.0	3.5	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	106	956		394	1335		131	142	121	161	155	
v/s Ratio Prot	0.03	c0.45		c0.19	0.10		c0.06	0.00		0.06	c0.02	
v/s Ratio Perm									0.00			
v/c Ratio	0.49	0.94		0.87	0.16		0.76	0.04	0.05	0.65	0.19	
Uniform Delay, d1	52.8	28.4		43.6	8.2		52.7	49.6	49.7	50.9	48.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.5	16.3		18.7	0.1		21.7	0.1	0.2	8.6	0.6	
Delay (s)	56.3	44.6		62.3	8.2		74.3	49.8	49.8	59.5	49.1	
Level of Service	E	D		E	A		E	D	D	E	D	
Approach Delay (s)		45.3			41.3			63.3			54.6	
Approach LOS		D			D			E			D	

Intersection Summary				
HCM 2000 Control Delay	46.8	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.83			
Actuated Cycle Length (s)	115.9	Sum of lost time (s)	15.0	
Intersection Capacity Utilization	89.4%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

MOVEMENT SUMMARY

Site: 30 [AM Cumulative Alt]

Novato Boulevard/Redwood Boulevard
AM Cumulative with Project Alternative

Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NB Redwood Boulevard											
3	L2	101	2.0	0.276	8.8	LOS A	1.2	29.9	0.66	0.66	31.7
8	T1	6	2.0	0.276	8.8	LOS A	1.2	29.9	0.66	0.66	31.6
18	R2	76	2.0	0.276	8.8	LOS A	1.2	29.9	0.66	0.66	30.9
Approach		184	2.0	0.276	8.8	LOS A	1.2	29.9	0.66	0.66	31.3
East: WB Novato Blvd											
1	L2	352	2.0	0.502	8.8	LOS A	3.5	87.9	0.49	0.33	31.6
6	T1	194	2.0	0.502	8.8	LOS A	3.5	87.9	0.49	0.33	31.6
16	R2	30	2.0	0.502	8.8	LOS A	3.5	87.9	0.49	0.33	30.8
Approach		575	2.0	0.502	8.8	LOS A	3.5	87.9	0.49	0.33	31.5
North: SB Redwood Boulevard											
7	L2	106	2.0	0.293	8.8	LOS A	1.3	32.3	0.65	0.65	31.7
4	T1	24	2.0	0.293	8.8	LOS A	1.3	32.3	0.65	0.65	31.7
14	R2	72	2.0	0.293	8.8	LOS A	1.3	32.3	0.65	0.65	30.9
Approach		202	2.0	0.293	8.8	LOS A	1.3	32.3	0.65	0.65	31.4
West: EB Novato Blvd											
5	L2	53	2.0	0.754	21.4	LOS C	5.8	146.9	0.77	0.91	27.8
2	T1	523	2.0	0.754	21.4	LOS C	5.8	146.9	0.77	0.91	27.8
12	R2	415	2.0	0.466	9.9	LOS A	2.6	65.5	0.65	0.66	31.4
Approach		990	2.0	0.754	16.6	LOS B	5.8	146.9	0.72	0.81	29.2
All Vehicles		1952	2.0	0.754	12.7	LOS B	5.8	146.9	0.64	0.64	30.3

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

Site: 30 [AM Cumulative Alt]

Novato Boulevard/Redwood Boulevard
AM Cumulative with Project Alternative

Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: NB Redwood Boulevard													
Lane 1[d]	184	2.0	666	0.276	100	8.8	LOS A	1.2	29.9	Full	1600	0.0	0.0
Approach	184	2.0		0.276		8.8	LOS A	1.2	29.9				
East: WB Novato Blvd													
Lane 1[d]	575	2.0	1145	0.502	100	8.8	LOS A	3.5	87.9	Full	1600	0.0	0.0
Approach	575	2.0		0.502		8.8	LOS A	3.5	87.9				
North: SB Redwood Boulevard													
Lane 1[d]	202	2.0	691	0.293	100	8.8	LOS A	1.3	32.3	Full	1600	0.0	0.0
Approach	202	2.0		0.293		8.8	LOS A	1.3	32.3				
West: EB Novato Blvd													
Lane 1[d]	575	2.0	763[1]	0.754	100	21.4	LOS C	5.8	146.9	Full	1600	0.0	0.0
Lane 2	415	2.0	890	0.466	100	9.9	LOS A	2.6	65.5	Short	30	0.0	NA
Approach	990	2.0		0.754		16.6	LOS B	5.8	146.9				
Intersection	1952	2.0		0.754		12.7	LOS B	5.8	146.9				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.
d Dominant lane on roundabout approach

HCM Signalized Intersection Capacity Analysis
31: Alameda Del Prado & Ignacio Blvd

06/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	880	469	268	371	19	69	4	240	7	2	0
Future Volume (vph)	13	880	469	268	371	19	69	4	240	7	2	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.6	3.6	3.0	3.6			3.5	3.5		3.7	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00			1.00	0.98		1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00			0.99	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	0.99			1.00	0.85		1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00		0.96	
Satd. Flow (prot)	1770	3610	1573	1900	3583			1786	1589		1824	
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.73	1.00		0.85	
Satd. Flow (perm)	1770	3610	1573	1805	3583			1368	1589		1608	
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)	14	917	489	279	386	20	72	4	250	7	2	0
RTOR Reduction (vph)	0	0	89	0	2	0	0	0	217	0	0	0
Lane Group Flow (vph)	14	917	400	279	404	0	0	76	33	0	9	0
Confl. Peds. (#/hr)			4				7		4	4		7
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2				8		8	4		
Actuated Green, G (s)	1.4	49.2	49.2	27.4	75.2			13.3	13.3		13.1	
Effective Green, g (s)	1.4	49.2	49.2	27.4	75.2			13.3	13.3		13.1	
Actuated g/C Ratio	0.01	0.49	0.49	0.27	0.75			0.13	0.13		0.13	
Clearance Time (s)	3.0	3.6	3.6	3.0	3.6			3.5	3.5		3.7	
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0			2.0	2.0		2.0	
Lane Grp Cap (vph)	24	1776	773	520	2694			181	211		210	
v/s Ratio Prot	0.01	0.25		c0.15	0.11							
v/s Ratio Perm			c0.25					c0.06	0.02		0.01	
v/c Ratio	0.58	0.52	0.52	0.54	0.15			0.42	0.16		0.04	
Uniform Delay, d1	49.0	17.3	17.3	30.9	3.5			39.8	38.4		38.0	
Progression Factor	1.00	1.00	1.00	0.60	0.49			1.00	1.00		1.00	
Incremental Delay, d2	21.1	1.1	2.5	0.5	0.1			0.6	0.1		0.0	
Delay (s)	70.1	18.4	19.8	19.1	1.8			40.4	38.5		38.0	
Level of Service	E	B	B	B	A			D	D		D	
Approach Delay (s)		19.4			8.9			39.0			38.0	
Approach LOS		B			A			D			D	

Intersection Summary				
HCM 2000 Control Delay	19.1	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.51			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.3	
Intersection Capacity Utilization	63.7%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
32: US 101 SB Off Ramp/Enfrente Rd & Ignacio Blvd

06/13/2017

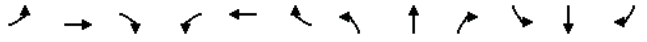
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	854	314	189	436	43	0	0	954	265	143	218
Future Volume (vph)	36	854	314	189	436	43	0	0	954	265	143	218
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	8.0	8.0	3.0	4.0				3.0		3.5	3.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95				0.88		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.96	1.00	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	1.00	0.85	1.00	0.99				0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00				1.00		0.97	1.00
Satd. Flow (prot)	1805	3610	1550	1787	3544				2842		1809	1578
Flt Permitted	0.95	1.00	1.00	0.95	1.00				1.00		0.97	1.00
Satd. Flow (perm)	1805	3610	1550	1787	3544				2842		1809	1578
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)	38	890	327	197	454	45	0	0	994	276	149	227
RTOR Reduction (vph)	0	0	134	0	6	0	0	0	325	0	0	163
Lane Group Flow (vph)	38	890	193	197	493	0	0	0	669	0	425	64
Confl. Peds. (#/hr)			7			20						1
Confl. Bikes (#/hr)						3						
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	5%	1%
Turn Type	Prot	NA	Perm	Prot	NA				Over	Split	NA	Perm
Protected Phases	5	2		1	6				1	7	7	
Permitted Phases			2									7
Actuated Green, G (s)	6.6	28.9	28.9	28.2	54.5				28.2		28.4	28.4
Effective Green, g (s)	6.6	28.9	28.9	28.2	54.5				28.2		28.4	28.4
Actuated g/C Ratio	0.07	0.29	0.29	0.28	0.54				0.28		0.28	0.28
Clearance Time (s)	3.0	8.0	8.0	3.0	4.0				3.0		3.5	3.5
Vehicle Extension (s)	2.0	2.5	2.5	3.0	4.0				3.0		2.5	2.5
Lane Grp Cap (vph)	119	1043	447	503	1931				801		513	448
v/s Ratio Prot	0.02	c0.25		0.11	0.14				c0.24		c0.23	
v/s Ratio Perm			0.12									0.04
v/c Ratio	0.32	0.85	0.43	0.39	0.26				0.83		0.83	0.14
Uniform Delay, d1	44.6	33.5	28.9	29.0	12.0				33.7		33.5	26.7
Progression Factor	0.90	0.68	0.47	1.56	1.97				1.00		1.00	1.00
Incremental Delay, d2	0.5	8.2	2.8	0.5	0.3				7.5		10.4	0.1
Delay (s)	40.7	30.9	16.3	45.6	24.0				41.2		43.9	26.8
Level of Service	D	C	B	D	C				D		D	C
Approach Delay (s)		27.4			30.1			41.2			38.0	
Approach LOS		C			C			D			D	

Intersection Summary				
HCM 2000 Control Delay	33.7	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.84			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.5	
Intersection Capacity Utilization	92.6%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
33: Nave Dr & Ignacio Blvd/Bel Marin Keys Blvd

06/13/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	751	1311	98	222	200	447	543	612	0	0	0
Future Volume (vph)	0	751	1311	98	222	200	447	543	612	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.6	3.0	4.0		4.6	4.6	3.0			
Lane Util. Factor		0.95	1.00	1.00	0.95		0.91	0.91	1.00			
Frpb, ped/bikes		1.00	1.00	1.00	0.99		1.00	1.00	0.99			
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00			
Frt		1.00	0.85	1.00	0.93		1.00	1.00	0.85			
Flt Protected		1.00	1.00	0.95	1.00		0.95	0.99	1.00			
Satd. Flow (prot)		3610	1607	1805	3300		1643	3398	1599			
Flt Permitted		1.00	1.00	0.95	1.00		0.95	0.99	1.00			
Satd. Flow (perm)		3610	1607	1805	3300		1643	3398	1599			
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)	0	799	1395	104	236	213	476	578	651	0	0	0
RTOR Reduction (vph)	0	0	84	0	121	0	0	0	10	0	0	0
Lane Group Flow (vph)	0	799	1311	104	328	0	343	711	641	0	0	0
Confl. Peds. (#/hr)			1			1			1			
Heavy Vehicles (%)	0%	0%	0%	0%	0%	2%	0%	1%	0%	0%	0%	0%
Turn Type		NA	pm+ov	Prot	NA		Split	NA	pm+ov			
Protected Phases		2	3	1	6		3	3	1			
Permitted Phases			2						3			
Actuated Green, G (s)		28.4	76.4	12.0	43.4		48.0	48.0	60.0			
Effective Green, g (s)		28.4	76.4	12.0	43.4		48.0	48.0	60.0			
Actuated g/C Ratio		0.28	0.76	0.12	0.43		0.48	0.48	0.60			
Clearance Time (s)		4.0	4.6	3.0	4.0		4.6	4.6	3.0			
Vehicle Extension (s)		4.0	2.0	2.0	4.0		2.0	2.0	2.0			
Lane Grp Cap (vph)		1025	1227	216	1432		788	1631	959			
v/s Ratio Prot		0.22	c0.51	0.06	0.10		0.21	0.21	c0.08			
v/s Ratio Perm			0.30						0.32			
v/c Ratio		0.78	1.07	0.48	0.23		0.44	0.44	0.67			
Uniform Delay, d1		32.9	11.8	41.1	17.8		17.1	17.1	13.4			
Progression Factor		0.90	1.53	1.18	0.93		1.00	1.00	1.00			
Incremental Delay, d2		3.2	40.3	0.6	0.4		0.1	0.1	1.4			
Delay (s)		32.9	58.4	48.9	16.9		17.2	17.2	14.7			
Level of Service		C	E	D	B		B	B	B			
Approach Delay (s)		49.1			22.9			16.3			0.0	
Approach LOS		D			C			B			A	

Intersection Summary				
HCM 2000 Control Delay	33.3	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	1.01			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.6	
Intersection Capacity Utilization	98.5%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
34: Bel Marin Keys Blvd & Commercial Blvd

06/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	12	77	0	9	48	1080	242	13	428	1
Future Volume (vph)	0	0	12	77	0	9	48	1080	242	13	428	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	3.0	3.9		3.0	3.5	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.86			1.00	0.85	1.00	0.97		1.00	1.00	
Flt Protected		1.00			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1620			1801	1395	1805	3493		1805	3573	
Flt Permitted		1.00			0.75	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1620			1420	1395	1805	3493		1805	3573	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	13	81	0	9	51	1137	255	14	451	1
RTOR Reduction (vph)	0	11	0	0	0	8	0	10	0	0	0	0
Lane Group Flow (vph)	0	2	0	0	81	1	51	1382	0	14	452	0
Confl. Peds. (#/hr)	3		2	2		3			3			
Heavy Vehicles (%)	2%	0%	0%	0%	0%	14%	0%	0%	0%	0%	1%	0%
Turn Type		NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		12.2			12.2	12.2	6.8	75.1		1.8	70.5	
Effective Green, g (s)		12.2			12.2	12.2	6.8	75.1		1.8	70.5	
Actuated g/C Ratio		0.12			0.12	0.12	0.07	0.75		0.02	0.70	
Clearance Time (s)		4.0			4.0	4.0	3.0	3.9		3.0	3.5	
Vehicle Extension (s)		3.0			3.0	3.0	2.5	3.0		2.5	4.0	
Lane Grp Cap (vph)		197			173	170	122	2623		32	2518	
v/s Ratio Prot		0.00					c0.03	c0.40		0.01	0.13	
v/s Ratio Perm					c0.06	0.00						
v/c Ratio		0.01			0.47	0.01	0.42	0.53		0.44	0.18	
Uniform Delay, d1		38.6			40.9	38.6	44.7	5.1		48.6	5.0	
Progression Factor		1.00			1.00	1.00	0.90	0.62		0.92	1.32	
Incremental Delay, d2		0.0			2.0	0.0	1.1	0.5		6.8	0.2	
Delay (s)		38.6			42.9	38.6	41.3	3.7		51.7	6.7	
Level of Service		D			D	D	D	A		D	A	
Approach Delay (s)		38.6			42.4			5.0			8.1	
Approach LOS		D			D			A			A	

Intersection Summary				
HCM 2000 Control Delay	7.6	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.53			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.9	
Intersection Capacity Utilization	60.5%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
35: Bel Marin Keys Blvd & Hamilton Dr/Digital Dr

06/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1	48	79	2	9	109	502	491	9	320	3
Future Volume (vph)	0	1	48	79	2	9	109	502	491	9	320	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	3.5	3.5	3.5		3.0	4.0		3.0	4.0	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.99	1.00	0.99		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	0.85	1.00	0.88		1.00	0.93		1.00	1.00	
Flt Protected		1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1900	1533	1803	1649		1770	3303		1805	3569	
Flt Permitted		1.00	1.00	0.76	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1900	1533	1437	1649		1770	3303		1805	3569	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1	51	83	2	9	115	528	517	9	337	3
RTOR Reduction (vph)	0	0	45	0	8	0	0	84	0	0	0	0
Lane Group Flow (vph)	0	1	6	83	3	0	115	961	0	9	340	0
Confl. Peds. (#/hr)	1		1	1		1			2			8
Heavy Vehicles (%)	0%	0%	4%	0%	0%	0%	2%	0%	0%	0%	1%	0%
Turn Type		NA	Perm	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8								
Actuated Green, G (s)		12.3	12.3	12.3	12.3		11.5	75.4		1.8	65.7	
Effective Green, g (s)		12.3	12.3	12.3	12.3		11.5	75.4		1.8	65.7	
Actuated g/C Ratio		0.12	0.12	0.12	0.12		0.12	0.75		0.02	0.66	
Clearance Time (s)		3.5	3.5	3.5	3.5		3.0	4.0		3.0	4.0	
Vehicle Extension (s)		2.0	2.0	2.5	2.5		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)		233	188	176	202		203	2490		32	2344	
v/s Ratio Prot		0.00			0.00		c0.06	c0.29		0.00	0.10	
v/s Ratio Perm			0.00	c0.06								
v/c Ratio		0.00	0.03	0.47	0.02		0.57	0.39		0.28	0.14	
Uniform Delay, d1		38.5	38.6	40.8	38.5		41.9	4.3		48.5	6.5	
Progression Factor		1.00	1.00	1.00	1.00		1.06	1.35		1.00	1.00	
Incremental Delay, d2		0.0	0.0	1.5	0.0		1.9	0.4		1.8	0.1	
Delay (s)		38.5	38.6	42.3	38.6		46.5	6.2		50.2	6.6	
Level of Service		D	D	D	D		D	A		D	A	
Approach Delay (s)		38.6			41.8			10.2			7.8	
Approach LOS		D			D			B			A	

Intersection Summary				
HCM 2000 Control Delay	12.3	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.43			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.5	
Intersection Capacity Utilization	58.6%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
36: Nave Dr & US 101 NB Off Ramp

06/13/2017

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	706	174	0	877	1200	195
Future Volume (vph)	706	174	0	877	1200	195
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		5.0	5.0	
Lane Util. Factor	0.97	1.00		0.95	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	0.98	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3467	1563		3574	3504	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3467	1563		3574	3504	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	767	189	0	953	1304	212
RTOR Reduction (vph)	0	20	0	0	19	0
Lane Group Flow (vph)	767	169	0	953	1498	0
Confl. Peds. (#/hr)		1				
Heavy Vehicles (%)	1%	2%	0%	1%	1%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	27.0	27.0		35.0	35.0	
Effective Green, g (s)	27.0	27.0		35.0	35.0	
Actuated g/C Ratio	0.39	0.39		0.50	0.50	
Clearance Time (s)	3.0	3.0		5.0	5.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	1337	602		1787	1752	
v/s Ratio Prot	c0.22			0.27	c0.43	
v/s Ratio Perm		0.11				
v/c Ratio	0.57	0.28		0.53	0.85	
Uniform Delay, d1	17.0	14.8		11.9	15.3	
Progression Factor	1.00	1.00		0.37	1.00	
Incremental Delay, d2	1.8	1.2		1.0	5.6	
Delay (s)	18.8	16.0		5.4	20.9	
Level of Service	B	B		A	C	
Approach Delay (s)	18.2			5.4	20.9	
Approach LOS	B			A	C	

Intersection Summary			
HCM 2000 Control Delay	15.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	69.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
37: Nave Dr & Hamilton Center

06/13/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	40	21	714	86	102	1125
Future Volume (vph)	40	21	714	86	102	1125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.2	3.2	4.4		3.0	4.4
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.99		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	1615	1868		1770	1881
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1805	1615	1868		1770	1881
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	23	776	93	111	1223
RTOR Reduction (vph)	0	22	5	0	0	0
Lane Group Flow (vph)	43	1	864	0	111	1223
Confl. Peds. (#/hr)				2		
Heavy Vehicles (%)	0%	0%	0%	0%	2%	1%
Turn Type	Prot	Perm	NA		Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8				
Actuated Green, G (s)	3.6	3.6	48.6		7.2	58.8
Effective Green, g (s)	3.6	3.6	48.6		7.2	58.8
Actuated g/C Ratio	0.05	0.05	0.69		0.10	0.84
Clearance Time (s)	3.2	3.2	4.4		3.0	4.4
Vehicle Extension (s)	1.0	1.0	1.0		1.0	1.0
Lane Grp Cap (vph)	92	83	1296		182	1580
v/s Ratio Prot	c0.02		0.46		0.06	c0.65
v/s Ratio Perm		0.00				
v/c Ratio	0.47	0.01	0.67		0.61	0.77
Uniform Delay, d1	32.3	31.5	6.1		30.1	2.6
Progression Factor	1.00	1.00	0.74		1.28	1.55
Incremental Delay, d2	1.4	0.0	2.2		2.3	2.3
Delay (s)	33.6	31.5	6.6		40.9	6.2
Level of Service	C	C	A		D	A
Approach Delay (s)	32.9		6.6			9.1
Approach LOS	C		A			A

Intersection Summary				
HCM 2000 Control Delay	8.9	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.79			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	10.6	
Intersection Capacity Utilization	71.2%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
38: Nave Dr & Hamilton Pkwy

06/13/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	119	277	488	42	359	771
Future Volume (vph)	119	277	488	42	359	771
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.2	3.2	4.4	4.4	3.0	4.4
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1599	1900	1578	1787	1850
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1599	1900	1578	1787	1900
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	129	301	530	46	390	838
RTOR Reduction (vph)	0	260	0	13	0	0
Lane Group Flow (vph)	129	41	530	33	390	838
Confl. Peds. (#/hr)				2		
Heavy Vehicles (%)	2%	1%	0%	0%	1%	0%
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Actuated Green, G (s)	9.6	9.6	25.4	25.4	24.4	52.8
Effective Green, g (s)	9.6	9.6	25.4	25.4	24.4	52.8
Actuated g/C Ratio	0.14	0.14	0.36	0.36	0.35	0.75
Clearance Time (s)	3.2	3.2	4.4	4.4	3.0	4.4
Vehicle Extension (s)	2.0	2.0	3.0	3.0	2.0	3.0
Lane Grp Cap (vph)	242	219	689	572	622	1395
v/s Ratio Prot	c0.07		c0.28		c0.22	0.45
v/s Ratio Perm		0.03		0.02		
v/c Ratio	0.53	0.19	0.77	0.06	0.63	0.60
Uniform Delay, d1	28.1	26.7	19.7	14.5	19.0	3.9
Progression Factor	1.00	1.00	1.00	1.00	1.25	0.67
Incremental Delay, d2	1.1	0.2	8.1	0.2	1.0	1.3
Delay (s)	29.2	26.9	27.8	14.7	24.7	3.9
Level of Service	C	C	C	B	C	A
Approach Delay (s)	27.6		26.7			10.5
Approach LOS	C		C			B

Intersection Summary				
HCM 2000 Control Delay	18.0	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.67			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	10.6	
Intersection Capacity Utilization	62.5%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
39: Nave Dr & Main Gate Dr

06/13/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	264	179	228	460	300	336
Future Volume (vph)	264	179	228	460	300	336
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	4.1	4.1	3.0	4.4
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1805	1615	1900	1615	1805	1881
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1805	1615	1900	1615	1805	1881
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	284	192	245	495	323	361
RTOR Reduction (vph)	0	143	0	370	0	0
Lane Group Flow (vph)	284	49	245	125	323	361
Heavy Vehicles (%)	0%	0%	0%	0%	0%	1%
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Actuated Green, G (s)	11.4	11.4	11.4	11.4	12.2	26.3
Effective Green, g (s)	11.4	11.4	11.4	11.4	12.2	26.3
Actuated g/C Ratio	0.25	0.25	0.25	0.25	0.27	0.58
Clearance Time (s)	3.0	3.0	4.1	4.1	3.0	4.4
Vehicle Extension (s)	2.0	2.0	1.0	1.0	1.0	1.0
Lane Grp Cap (vph)	456	408	480	408	488	1096
v/s Ratio Prot	c0.16		c0.13		c0.18	0.19
v/s Ratio Perm		0.03		0.08		
v/c Ratio	0.62	0.12	0.51	0.31	0.66	0.33
Uniform Delay, d1	14.9	13.0	14.5	13.6	14.6	4.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	1.9	0.0	0.4	0.2	2.6	0.1
Delay (s)	16.9	13.0	14.8	13.8	17.2	4.9
Level of Service	B	B	B	B	B	A
Approach Delay (s)	15.3		14.1			10.7
Approach LOS	B		B			B

Intersection Summary				
HCM 2000 Control Delay	13.2	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.60			
Actuated Cycle Length (s)	45.1	Sum of lost time (s)	10.1	
Intersection Capacity Utilization	53.3%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
40: Nave Dr & Bolling Dr

06/13/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	338	110	520	98	83	531
Future Volume (vph)	338	110	520	98	83	531
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	4.1		3.0	3.5
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	0.97	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.98		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1787	1571	1844		1805	1881
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1787	1571	1844		1805	1881
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	367	120	565	107	90	577
RTOR Reduction (vph)	0	85	9	0	0	0
Lane Group Flow (vph)	367	35	663	0	90	577
Confl. Peds. (#/hr)		6				
Heavy Vehicles (%)	1%	0%	1%	0%	0%	1%
Turn Type	Prot	Perm	NA		Prot	NA
Protected Phases	4		6		5	2
Permitted Phases		4				
Actuated Green, G (s)	17.4	17.4	25.3		6.5	35.4
Effective Green, g (s)	17.4	17.4	25.3		6.5	35.4
Actuated g/C Ratio	0.29	0.29	0.43		0.11	0.60
Clearance Time (s)	3.0	3.0	4.1		3.0	3.5
Vehicle Extension (s)	2.0	2.0	2.0		2.0	2.0
Lane Grp Cap (vph)	524	460	786		197	1122
v/s Ratio Prot	c0.21		c0.36		0.05	c0.31
v/s Ratio Perm		0.02				
v/c Ratio	0.70	0.08	0.84		0.46	0.51
Uniform Delay, d1	18.6	15.1	15.2		24.7	6.9
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	3.4	0.0	7.9		0.6	0.2
Delay (s)	22.1	15.2	23.1		25.4	7.1
Level of Service	C	B	C		C	A
Approach Delay (s)	20.4		23.1			9.6
Approach LOS	C		C			A

Intersection Summary				
HCM 2000 Control Delay	17.4	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.75			
Actuated Cycle Length (s)	59.3	Sum of lost time (s)	10.1	
Intersection Capacity Utilization	69.9%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Intersection	
Intersection Delay, s/veh	33.6
Intersection LOS	D

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations																
Traffic Vol, veh/h	0	131	12	0	0	66	123	619	0	2	164	45	0	109	21	6
Future Vol, veh/h	0	131	12	0	0	66	123	619	0	2	164	45	0	109	21	6
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	138	13	0	0	69	129	652	0	2	173	47	0	115	22	6
Number of Lanes	0	0	1	0	0	0	1	1	0	0	1	0	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	2	1
HCM Control Delay	13.7	45.2	16.1	13.2
HCM LOS	B	E	C	B

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	1%	92%	35%	0%	100%	0%
Vol Thru, %	78%	8%	65%	0%	0%	78%
Vol Right, %	21%	0%	0%	100%	0%	22%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	211	143	189	619	109	27
LT Vol	2	131	66	0	109	0
Through Vol	164	12	123	0	0	21
RT Vol	45	0	0	619	0	6
Lane Flow Rate	222	151	199	652	115	28
Geometry Grp	6	6	7	7	7	7
Degree of Util (X)	0.449	0.309	0.35	0.987	0.261	0.059
Departure Headway (Hd)	7.274	7.379	6.443	5.555	8.204	7.531
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	498	489	561	658	439	477
Service Time	5.274	5.404	4.143	3.255	5.922	5.248
HCM Lane V/C Ratio	0.446	0.309	0.355	0.991	0.262	0.059
HCM Control Delay	16.1	13.7	12.6	55.1	13.8	10.7
HCM Lane LOS	C	B	B	F	B	B
HCM 95th-tile Q	2.3	1.3	1.6	15	1	0.2

Intersection	
Intersection Delay, s/veh	129.9
Intersection LOS	F

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations												
Traffic Vol, veh/h	0	12	481	96	0	342	1009	32	0	112	16	169
Future Vol, veh/h	0	12	481	96	0	342	1009	32	0	112	16	169
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	13	506	101	0	360	1062	34	0	118	17	178
Number of Lanes	0	1	2	0	0	1	2	0	0	0	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	SB
Opposing Lanes	3	3	1
Conflicting Approach Left	SB	NB	EB
Conflicting Lanes Left	1	2	3
Conflicting Approach Right	NB	SB	WB
Conflicting Lanes Right	2	1	3
HCM Control Delay	47.5	191	25.4
HCM LOS	E	F	D

Lane	NBLn1	NBLn2	EBLn1	EBLn2	EBLn3	WBLn1	WBLn2	WBLn3	SBLn1
Vol Left, %	88%	0%	100%	0%	0%	100%	0%	0%	43%
Vol Thru, %	12%	0%	0%	100%	63%	0%	100%	91%	27%
Vol Right, %	0%	100%	0%	0%	37%	0%	0%	9%	30%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	128	169	12	321	256	342	673	368	44
LT Vol	112	0	12	0	0	342	0	0	19
Through Vol	16	0	0	321	160	0	673	336	12
RT Vol	0	169	0	0	96	0	0	32	13
Lane Flow Rate	135	178	13	338	270	360	708	388	46
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.431	0.513	0.035	0.899	0.699	0.904	1.676	0.911	0.154
Departure Headway (Hd)	12.783	11.62	11.082	10.564	10.293	9.039	8.523	8.46	12.971
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	284	313	325	344	353	400	432	426	278
Service Time	10.483	9.32	8.782	8.264	7.993	6.817	6.301	6.238	10.671
HCM Lane V/C Ratio	0.475	0.569	0.04	0.983	0.765	0.9	1.639	0.911	0.165
HCM Control Delay	24.8	25.9	14.2	59.7	33.7	54.8	335.5	53.7	18
HCM Lane LOS	C	D	B	F	D	F	F	F	C
HCM 95th-tile Q	2.1	2.8	0.1	8.8	5	9.4	41.7	9.9	0.5

HCM 2010 AWSC
1: Simmons Ln & San Marin Dr 06/13/2017

Intersection	
Intersection Delay, s/veh	
Intersection LOS	

Movement	SBU	SBL	SBT	SBR
Lane Configurations				
Traffic Vol, veh/h	0	19	12	13
Future Vol, veh/h	0	19	12	13
Peak Hour Factor	0.95	0.95	0.95	0.95
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	20	13	14
Number of Lanes	0	0	1	0

Approach	SB
Opposing Approach	NB
Opposing Lanes	2
Conflicting Approach Left	WB
Conflicting Lanes Left	3
Conflicting Approach Right	EB
Conflicting Lanes Right	3
HCM Control Delay	18
HCM LOS	C

Novato General Plan Update EIR W-Trans
PM Peak Hour Cumulative with Project Alt

MOVEMENT SUMMARY

Site: 1 [PM Cumulative Alt]

Simmons Lane/San Marin Drive
PM Cumulative with Project Alternative

Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NB Simmons Ln											
3	L2	117	2.0	0.398	9.7	LOS A	2.0	51.8	0.67	0.68	31.6
8	T1	17	2.0	0.398	9.7	LOS A	2.0	51.8	0.67	0.68	31.6
18	R2	176	2.0	0.398	9.7	LOS A	2.0	51.8	0.67	0.68	30.9
Approach		309	2.0	0.398	9.7	LOS A	2.0	51.8	0.67	0.68	31.2
East: WB San Marin Drive											
1	L2	356	2.0	0.293	5.6	LOS A	1.5	36.9	0.33	0.20	32.1
6	T1	1051	2.0	1.010	49.7	LOS F	44.4	1128.4	1.00	1.08	20.7
16	R2	33	2.0	1.010	49.7	LOS F	44.4	1128.4	1.00	1.08	20.3
Approach		1441	2.0	1.010	38.8	LOS D	44.4	1128.4	0.83	0.86	22.7
North: SB Simmons Ln											
7	L2	20	2.0	0.122	11.6	LOS B	0.4	9.7	0.76	0.76	30.7
4	T1	13	2.0	0.122	11.6	LOS B	0.4	9.7	0.76	0.76	30.7
14	R2	14	2.0	0.122	11.6	LOS B	0.4	9.7	0.76	0.76	30.0
Approach		46	2.0	0.122	11.6	LOS B	0.4	9.7	0.76	0.76	30.5
West: EB San Marin Drive											
5	L2	13	2.0	0.679	15.4	LOS B	6.3	159.3	0.81	0.87	30.1
2	T1	501	2.0	0.679	15.4	LOS B	6.3	159.3	0.81	0.87	30.1
12	R2	100	2.0	0.679	15.4	LOS B	6.3	159.3	0.81	0.87	29.4
Approach		614	2.0	0.679	15.4	LOS B	6.3	159.3	0.81	0.87	30.0
All Vehicles		2409	2.0	1.010	28.6	LOS C	44.4	1128.4	0.81	0.84	25.2

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

Site: 1 [PM Cumulative Alt]

Simmons Lane/San Marin Drive
PM Cumulative with Project Alternative

Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: NB Simmons Ln													
Lane 1[d]	309	2.0	777	0.398	100	9.7	LOS A	2.0	51.8	Full	1600	0.0	0.0
Approach	309	2.0		0.398		9.7	LOS A	2.0	51.8				
East: WB San Marin Drive													
Lane 1	356	2.0	1216	0.293	100	5.6	LOS A	1.5	36.9	Short	100	0.0	NA
Lane 2[d]	1084	2.0	1074[1]	1.010	100	49.7	LOS F	44.4	1128.4	Full	1600	0.0	0.0
Approach	1441	2.0		1.010		38.8	LOS D	44.4	1128.4				
North: SB Simmons Ln													
Lane 1[d]	46	2.0	375	0.122	100	11.6	LOS B	0.4	9.7	Full	1600	0.0	0.0
Approach	46	2.0		0.122		11.6	LOS B	0.4	9.7				
West: EB San Marin Drive													
Lane 1[d]	614	2.0	903	0.679	100	15.4	LOS B	6.3	159.3	Full	1600	0.0	0.0
Approach	614	2.0		0.679		15.4	LOS B	6.3	159.3				
Intersection	2409	2.0		1.010		28.6	LOS C	44.4	1128.4				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the full-length lanes. Some upstream delays at entry to short lanes are not included.
d Dominant lane on roundabout approach

HCM Signalized Intersection Capacity Analysis
1: Simmons Ln & San Marin Dr

06/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	481	96	342	1009	32	112	16	169	19	12	13
Future Volume (vph)	12	481	96	342	1009	32	112	16	169	19	12	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		1.00	0.85		0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.98	
Satd. Flow (prot)	1770	1863	1583	1770	1863	1583		1785	1583		1751	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.75	1.00		0.86	
Satd. Flow (perm)	1770	1863	1583	1770	1863	1583		1401	1583		1540	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	13	506	101	360	1062	34	118	17	178	20	13	14
RTOR Reduction (vph)	0	0	58	0	0	11	0	0	86	0	12	0
Lane Group Flow (vph)	13	506	43	360	1062	23	0	135	92	0	35	0
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA	pm+ov	Perm	NA	
Protected Phases	7	4		3	8			2	3		6	
Permitted Phases			4			8	2		2	6		
Actuated Green, G (s)	0.7	33.2	33.2	19.2	51.7	51.7		13.6	32.8		13.6	
Effective Green, g (s)	0.7	33.2	33.2	19.2	51.7	51.7		13.6	32.8		13.6	
Actuated g/C Ratio	0.01	0.43	0.43	0.25	0.66	0.66		0.17	0.42		0.17	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0		4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	
Lane Grp Cap (vph)	15	792	673	435	1234	1049		244	746		268	
v/s Ratio Prot	0.01	0.27		c0.20	c0.57				0.03			
v/s Ratio Perm			0.03			0.01		c0.10	0.03		0.02	
v/c Ratio	0.87	0.64	0.06	0.83	0.86	0.02		0.55	0.12		0.13	
Uniform Delay, d1	38.6	17.7	13.2	27.8	10.3	4.5		29.4	13.8		27.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2	162.9	1.7	0.0	12.2	6.3	0.0		2.7	0.1		0.2	
Delay (s)	201.5	19.4	13.3	40.1	16.7	4.5		32.1	13.9		27.4	
Level of Service	F	B	B	D	B	A		C	B		C	
Approach Delay (s)		22.2			22.2			21.8			27.4	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM 2000 Control Delay	22.2	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.82			
Actuated Cycle Length (s)	78.0	Sum of lost time (s)	12.0	
Intersection Capacity Utilization	79.4%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
2: W Campus Dr & San Marin Dr

06/13/2017

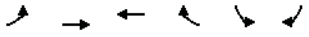
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	707	0	3	1381	45	0	0	0	207	0	36
Future Volume (vph)	8	707	0	3	1381	45	0	0	0	207	0	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.8		4.0	4.8	4.8				4.0	4.0	4.0
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00				0.95	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00				1.00	1.00	1.00
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00				1.00	1.00	1.00
Frt	1.00	1.00		1.00	1.00	0.85				1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00				0.95	0.95	1.00
Satd. Flow (prot)	1805	3574		1805	3574	1615				1715	1715	1615
Flt Permitted	0.95	1.00		0.95	1.00	1.00				0.76	0.76	1.00
Satd. Flow (perm)	1805	3574		1805	3574	1615				1367	1367	1615
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	8	744	0	3	1454	47	0	0	0	218	0	38
RTOR Reduction (vph)	0	0	0	0	0	18	0	0	0	0	0	33
Lane Group Flow (vph)	8	744	0	3	1454	29	0	0	0	109	109	5
Confl. Peds. (#/hr)			2									
Heavy Vehicles (%)	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Prot	NA		Prot	NA	Perm				Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8			4		4
Actuated Green, G (s)	1.5	36.6		1.3	36.4	36.4				8.4	8.4	8.4
Effective Green, g (s)	1.5	36.6		1.3	36.4	36.4				8.4	8.4	8.4
Actuated g/C Ratio	0.03	0.62		0.02	0.62	0.62				0.14	0.14	0.14
Clearance Time (s)	4.0	4.8		4.0	4.8	4.8				4.0	4.0	4.0
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0				2.0	2.0	2.0
Lane Grp Cap (vph)	45	2213		39	2201	994				194	194	229
v/s Ratio Prot	c0.00	0.21		0.00	c0.41							
v/s Ratio Perm						0.02				c0.08	0.08	0.00
v/c Ratio	0.18	0.34		0.08	0.66	0.03				0.56	0.56	0.02
Uniform Delay, d1	28.2	5.4		28.3	7.3	4.4				23.6	23.6	21.8
Progression Factor	1.00	1.00		1.00	1.00	1.00				1.00	1.00	1.00
Incremental Delay, d2	0.7	0.1		0.3	0.8	0.0				2.2	2.2	0.0
Delay (s)	28.9	5.5		28.6	8.2	4.5				25.8	25.8	21.8
Level of Service	C	A		C	A	A				C	C	C
Approach Delay (s)		5.8			8.1			0.0			25.3	
Approach LOS		A			A			A			C	

Intersection Summary				
HCM 2000 Control Delay	9.2	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.63			
Actuated Cycle Length (s)	59.1	Sum of lost time (s)	12.8	
Intersection Capacity Utilization	53.8%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: San Marin Dr & E Campus Drive

06/13/2017



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	3	918	1424	136	493	12
Future Volume (vph)	3	918	1424	136	493	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.3	4.3	4.3	3.0	3.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1805	3574	3574	1615	3502	1595
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1805	3574	3574	1615	3502	1595
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	3	956	1483	142	514	12
RTOR Reduction (vph)	0	0	0	53	0	10
Lane Group Flow (vph)	3	956	1483	89	514	3
Confl. Peds. (#/hr)						1
Heavy Vehicles (%)	0%	1%	1%	0%	0%	0%
Turn Type	Prot	NA	NA	Perm	Prot	Perm
Protected Phases	5	2	6		4	
Permitted Phases				6		4
Actuated Green, G (s)	1.3	48.7	44.4	44.4	18.2	18.2
Effective Green, g (s)	1.3	48.7	44.4	44.4	18.2	18.2
Actuated g/C Ratio	0.02	0.66	0.60	0.60	0.25	0.25
Clearance Time (s)	3.0	4.3	4.3	4.3	3.0	3.0
Vehicle Extension (s)	2.0	4.0	4.0	4.0	2.0	2.0
Lane Grp Cap (vph)	31	2345	2138	966	858	391
v/s Ratio Prot	0.00	c0.27	c0.41		c0.15	
v/s Ratio Perm				0.05		0.00
v/c Ratio	0.10	0.41	0.69	0.09	0.60	0.01
Uniform Delay, d1	35.9	6.0	10.2	6.3	24.8	21.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	0.2	1.1	0.1	0.8	0.0
Delay (s)	36.4	6.1	11.3	6.4	25.5	21.2
Level of Service	D	A	B	A	C	C
Approach Delay (s)		6.2	10.9		25.4	
Approach LOS		A	B		C	

Intersection Summary				
HCM 2000 Control Delay	11.9	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.66			
Actuated Cycle Length (s)	74.2	Sum of lost time (s)	10.3	
Intersection Capacity Utilization	60.8%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
4: Redwood Blvd & San Marin Dr

06/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	1167	229	417	1110	232	302	100	562	730	165	107
Future Volume (vph)	36	1167	229	417	1110	232	302	100	562	730	165	107
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.6		3.0	4.0		4.3	4.3	4.3	4.3	4.3	
Lane Util. Factor	1.00	0.91		1.00	0.91		0.97	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	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	1.00	
Frt	1.00	0.98		1.00	0.97		1.00	1.00	0.85	1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1787	4997		1752	5003		3467	1881	1568	1787	1758	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1787	4997		1752	5003		3467	1881	1568	1787	1758	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	38	1228	241	439	1168	244	318	105	592	768	174	113
RTOR Reduction (vph)	0	22	0	0	24	0	0	0	177	0	18	0
Lane Group Flow (vph)	38	1447	0	439	1388	0	318	105	415	768	269	0
Confl. Peds. (#/hr)			4									5
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	1%	1%	1%	3%	1%	1%	1%	1%	3%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA		Split	NA	Perm	Split	NA	
Protected Phases	1	6		5	2		7	7		8	8	
Permitted Phases					2				7			
Actuated Green, G (s)	8.0	44.1		14.8	50.5		12.2	12.2	12.2	43.7	43.7	
Effective Green, g (s)	8.0	44.1		14.8	50.5		12.2	12.2	12.2	43.7	43.7	
Actuated g/C Ratio	0.06	0.34		0.11	0.39		0.09	0.09	0.09	0.34	0.34	
Clearance Time (s)	3.0	3.6		3.0	4.0		4.3	4.3	4.3	4.3	4.3	
Vehicle Extension (s)	2.0	4.0		5.0	4.0		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	109	1695		199	1943		325	176	147	600	590	
v/s Ratio Prot	0.02	c0.29		c0.25	0.28		0.09	0.06		c0.43	0.15	
v/s Ratio Perm									c0.26			
v/c Ratio	0.35	0.85		2.21	0.71		0.98	0.60	2.83	1.28	0.46	
Uniform Delay, d1	58.5	39.9		57.6	33.6		58.8	56.5	58.9	43.1	33.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.7	4.6		558.8	2.3		43.4	3.6	839.9	138.5	0.2	
Delay (s)	59.2	44.5		616.4	35.9		102.2	60.1	898.8	181.6	34.0	
Level of Service	E	D		F	D		F	E	F	F	C	
Approach Delay (s)		44.9			173.6			562.4			141.5	
Approach LOS		D			F			F			F	

Intersection Summary				
HCM 2000 Control Delay	204.3	HCM 2000 Level of Service	F	
HCM 2000 Volume to Capacity ratio	1.40			
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	15.6	
Intersection Capacity Utilization	114.6%	ICU Level of Service	H	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
4: Redwood Blvd & San Marin Dr

06/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	1167	229	417	1110	232	302	100	562	730	165	107
Future Volume (vph)	36	1167	229	417	1110	232	302	100	562	730	165	107
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.6		3.0	4.0	4.3	4.3	4.3	3.0	4.3	4.3	
Lane Util. Factor	1.00	0.91		0.97	0.95	1.00	0.95	0.95	0.88	0.91	0.91	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	0.98	1.00	0.95	0.97	
Satd. Flow (prot)	1787	4996		3400	3574	1599	1698	1743	2760	1626	3235	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	0.98	1.00	0.95	0.97	
Satd. Flow (perm)	1787	4996		3400	3574	1599	1698	1743	2760	1626	3235	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	38	1228	241	439	1168	244	318	105	592	768	174	113
RTOR Reduction (vph)	0	21	0	0	0	76	0	0	49	0	12	0
Lane Group Flow (vph)	38	1448	0	439	1168	168	210	213	543	384	659	0
Confl. Peds. (#/hr)			4									5
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	1%	1%	1%	3%	1%	1%	1%	1%	3%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA	pm+ov	Split	NA	pm+ov	Split	NA	
Protected Phases	5	2		1	6	4	8	8	1	4	4	
Permitted Phases						6			8			
Actuated Green, G (s)	8.0	46.6		20.6	58.8	96.3	20.1	20.1	40.7	37.5	37.5	
Effective Green, g (s)	8.0	46.6		20.6	58.8	96.3	20.1	20.1	40.7	37.5	37.5	
Actuated g/C Ratio	0.06	0.33		0.15	0.42	0.69	0.14	0.14	0.29	0.27	0.27	
Clearance Time (s)	3.0	3.6		3.0	4.0	4.3	4.3	4.3	3.0	4.3	4.3	
Vehicle Extension (s)	2.0	4.0		5.0	4.0	2.0	2.0	2.0	5.0	2.0	2.0	
Lane Grp Cap (vph)	102	1662		500	1501	1099	243	250	802	435	866	
v/s Ratio Prot	0.02	c0.29		c0.13	0.33	0.04	c0.12	0.12	0.10	c0.24	0.20	
v/s Ratio Perm						0.06			0.10			
v/c Ratio	0.37	0.87		0.88	0.78	0.15	0.86	0.85	0.68	0.88	0.76	
Uniform Delay, d1	63.6	43.9		58.5	35.0	7.6	58.6	58.5	43.8	49.1	47.1	
Progression Factor	1.00	1.00		0.83	0.57	3.38	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.8	6.6		14.6	3.4	0.0	25.0	22.6	3.0	18.2	3.6	
Delay (s)	64.4	50.5		63.0	23.5	25.7	83.6	81.1	46.8	67.3	50.7	
Level of Service	E	D		E	C	C	F	F	D	E	D	
Approach Delay (s)		50.8			33.1			61.6			56.8	
Approach LOS		D			C			E			E	

Intersection Summary				
HCM 2000 Control Delay	48.0	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.88			
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	15.6	
Intersection Capacity Utilization	96.0%	ICU Level of Service	F	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
5: US 101 SB Ramps & San Marin Dr

06/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1302	1122	199	1427	0	0	0	0	67	2	386
Future Volume (vph)	0	1302	1122	199	1427	0	0	0	0	67	2	386
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.9	4.9	3.0	5.3						4.0	4.0
Lane Util. Factor		0.95	1.00	1.00	0.95						1.00	0.88
Frpb, ped/bikes		1.00	0.98	1.00	1.00						1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00	1.00						1.00	1.00
Frt		1.00	0.85	1.00	1.00						1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (prot)		3574	1575	1805	3574						1812	2814
Flt Permitted		1.00	1.00	0.95	1.00						0.95	1.00
Satd. Flow (perm)		3574	1575	1805	3574						1812	2814
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	0	1342	1157	205	1471	0	0	0	0	69	2	398
RTOR Reduction (vph)	0	0	264	0	0	0	0	0	0	0	0	127
Lane Group Flow (vph)	0	1342	893	205	1471	0	0	0	0	0	71	271
Confl. Peds. (#/hr)			4									
Heavy Vehicles (%)	0%	1%	1%	0%	1%	0%	0%	0%	0%	0%	0%	1%
Turn Type		NA	Perm	Prot	NA					Split	NA	Perm
Protected Phases		2		1	6					4	4	
Permitted Phases			2									4
Actuated Green, G (s)		41.2	41.2	9.0	52.8						7.9	7.9
Effective Green, g (s)		41.2	41.2	9.0	52.8						7.9	7.9
Actuated g/C Ratio		0.59	0.59	0.13	0.75						0.11	0.11
Clearance Time (s)		4.9	4.9	3.0	5.3						4.0	4.0
Vehicle Extension (s)		4.0	4.0	2.0	4.0						2.0	2.0
Lane Grp Cap (vph)		2103	927	232	2695						204	317
v/s Ratio Prot		0.38		c0.11	0.41						0.04	
v/s Ratio Perm			c0.57									c0.10
v/c Ratio		0.64	0.96	0.88	0.55						0.35	0.86
Uniform Delay, d1		9.5	13.7	30.0	3.6						28.7	30.5
Progression Factor		1.00	1.00	1.00	1.00						1.00	1.00
Incremental Delay, d2		1.5	22.0	29.5	0.8						0.4	19.0
Delay (s)		11.0	35.7	59.5	4.4						29.0	49.5
Level of Service		B	D	E	A						C	D
Approach Delay (s)		22.4			11.1			0.0			46.4	
Approach LOS		C			B			A			D	

Intersection Summary				
HCM 2000 Control Delay	20.8	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.94			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	11.9	
Intersection Capacity Utilization	144.0%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
6: US 101 NB Ramps & San Marin Dr

06/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	629	690	0	0	568	63	1157	113	263	0	0	0
Future Volume (vph)	629	690	0	0	568	63	1157	113	263	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.6			4.9	4.9	3.5	3.5				
Lane Util. Factor	0.97	1.00			0.95	1.00	0.95	0.95				
Frpb, ped/bikes	1.00	1.00			1.00	0.99	1.00	0.99				
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00				
Frt	1.00	1.00			1.00	0.85	1.00	0.95				
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.98				
Satd. Flow (prot)	3467	1881			3574	1593	1681	1624				
Flt Permitted	0.95	1.00			1.00	1.00	0.95	0.98				
Satd. Flow (perm)	3467	1881			3574	1593	1681	1624				
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)	655	719	0	0	592	66	1205	118	274	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	55	0	28	0	0	0	0
Lane Group Flow (vph)	655	719	0	0	592	11	807	762	0	0	0	0
Confl. Peds. (#/hr)			3			1			1	1		
Heavy Vehicles (%)	1%	1%	0%	0%	1%	0%	2%	0%	3%	0%	0%	0%
Turn Type	Prot	NA			NA	Perm	Split	NA				
Protected Phases	5	2			6		8	8				
Permitted Phases						6						
Actuated Green, G (s)	10.3	26.0			11.9	11.9	34.6	34.6				
Effective Green, g (s)	10.3	26.0			11.9	11.9	34.6	34.6				
Actuated g/C Ratio	0.15	0.38			0.17	0.17	0.50	0.50				
Clearance Time (s)	3.5	4.6			4.9	4.9	3.5	3.5				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	2.5	2.5				
Lane Grp Cap (vph)	519	711			619	275	846	817				
v/s Ratio Prot	c0.19	c0.38			0.17		c0.48	0.47				
v/s Ratio Perm						0.01						
v/c Ratio	1.26	1.01			0.96	0.04	0.95	0.93				
Uniform Delay, d1	29.2	21.4			28.1	23.7	16.3	16.0				
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00				
Incremental Delay, d2	132.8	36.6			25.7	0.1	20.4	17.3				
Delay (s)	162.0	57.9			53.8	23.7	36.7	33.3				
Level of Service	F	E			D	C	D	C				
Approach Delay (s)		107.5			50.8			35.0			0.0	
Approach LOS		F			D			D			A	

Intersection Summary				
HCM 2000 Control Delay	65.3	HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio	1.07			
Actuated Cycle Length (s)	68.7	Sum of lost time (s)	11.9	
Intersection Capacity Utilization	144.0%	ICU Level of Service	H	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
6: US 101 NB Ramps & San Marin Dr

06/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	629	690	0	0	568	63	1157	113	263	0	0	0
Future Volume (vph)	629	690	0	0	568	63	1157	113	263	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.6			4.9	4.9	3.5	3.5				
Lane Util. Factor	0.97	1.00			0.95	1.00	0.97	1.00				
Frpb, ped/bikes	1.00	1.00			1.00	0.99	1.00	0.99				
Flpb, ped/bikes	1.00	1.00			1.00	1.00	1.00	1.00				
Frt	1.00	1.00			1.00	0.85	1.00	0.90				
Flt Protected	0.95	1.00			1.00	1.00	0.95	1.00				
Satd. Flow (prot)	3467	1881			3574	1593	3433	1641				
Flt Permitted	0.95	1.00			1.00	1.00	0.95	1.00				
Satd. Flow (perm)	3467	1881			3574	1593	3433	1641				
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)	655	719	0	0	592	66	1205	118	274	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	39	0	54	0	0	0	0
Lane Group Flow (vph)	655	719	0	0	592	27	1205	338	0	0	0	0
Confl. Peds. (#/hr)			3			1			1	1		
Heavy Vehicles (%)	1%	1%	0%	0%	1%	0%	2%	0%	3%	0%	0%	0%
Turn Type	Prot	NA			NA	Perm	Split	NA				
Protected Phases	5	2			6		8	8				
Permitted Phases						6						
Actuated Green, G (s)	30.2	62.5			28.5	28.5	69.4	69.4				
Effective Green, g (s)	30.2	62.5			28.5	28.5	69.4	69.4				
Actuated g/C Ratio	0.22	0.45			0.20	0.20	0.50	0.50				
Clearance Time (s)	3.5	4.6			4.9	4.9	3.5	3.5				
Vehicle Extension (s)	2.0	4.0			4.0	4.0	2.5	2.5				
Lane Grp Cap (vph)	747	839			727	324	1701	813				
v/s Ratio Prot	0.19	c0.38			0.17		c0.35	0.21				
v/s Ratio Perm						0.02						
v/c Ratio	0.88	0.86			0.81	0.08	0.71	0.42				
Uniform Delay, d1	53.1	34.7			53.2	45.2	27.4	22.4				
Progression Factor	0.72	0.55			1.00	1.00	1.00	1.00				
Incremental Delay, d2	7.3	5.9			7.3	0.2	2.5	1.6				
Delay (s)	45.5	24.9			60.6	45.3	30.0	24.0				
Level of Service	D	C			E	D	C	C				
Approach Delay (s)		34.7			59.0			28.5			0.0	
Approach LOS		C			E			C			A	

Intersection Summary				
HCM 2000 Control Delay	36.4	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.80			
Actuated Cycle Length (s)	140.0	Sum of lost time (s)	11.9	
Intersection Capacity Utilization	112.1%	ICU Level of Service	H	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
7: Redwood Blvd & Olive St

06/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	166	74	36	188	107	112	77	835	210	137	539	157
Future Volume (vph)	166	74	36	188	107	112	77	835	210	137	539	157
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.1	5.1			5.1		4.0	3.9	3.9	4.0	3.9	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95	1.00	1.00	0.95	
Frt	1.00	0.95			0.96		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00			0.98		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1770	1771			1753		1770	3539	1583	1770	3420	
Flt Permitted	0.95	1.00			0.98		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1770	1771			1753		1770	3539	1583	1770	3420	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	175	78	38	198	113	118	81	879	221	144	567	165
RTOR Reduction (vph)	0	18	0	0	12	0	0	0	78	0	23	0
Lane Group Flow (vph)	175	98	0	0	417	0	81	879	143	144	709	0
Turn Type	Split	NA		Split	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	14.0	14.0			26.1		7.8	28.4	28.4	10.1	30.7	
Effective Green, g (s)	14.0	14.0			26.1		7.8	28.4	28.4	10.1	30.7	
Actuated g/C Ratio	0.14	0.14			0.27		0.08	0.29	0.29	0.10	0.32	
Clearance Time (s)	5.1	5.1			5.1		4.0	3.9	3.9	4.0	3.9	
Vehicle Extension (s)	1.0	1.0			1.0		1.0	1.0	1.0	1.0	1.0	
Lane Grp Cap (vph)	256	256			473		142	1039	464	184	1085	
v/s Ratio Prot	c0.10	0.06			c0.24		0.05	c0.25		c0.08	0.21	
v/s Ratio Perm									0.09			
v/c Ratio	0.68	0.38			0.88		0.57	0.85	0.31	0.78	0.65	
Uniform Delay, d1	39.2	37.4			33.8		42.8	32.1	26.5	42.2	28.4	
Progression Factor	1.00	1.00			1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	5.9	0.3			16.9		3.4	6.2	0.1	17.9	1.1	
Delay (s)	45.1	37.8			50.8		46.2	38.3	26.7	60.1	29.5	
Level of Service	D	D			D		D	D	C	E	C	
Approach Delay (s)		42.2			50.8			36.7			34.5	
Approach LOS		D			D			D			C	

Intersection Summary				
HCM 2000 Control Delay	38.8	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.81			
Actuated Cycle Length (s)	96.7	Sum of lost time (s)	18.1	
Intersection Capacity Utilization	71.9%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
8: Redwood Blvd & Grant Ave

06/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	141	142	329	49	178	88	414	652	74	62	556	181
Future Volume (vph)	141	142	329	49	178	88	414	652	74	62	556	181
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5		3.5	3.7	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.95	1.00	1.00	0.96	1.00	0.99		1.00	0.99	
Flpb, ped/bikes	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1752	1900	1526	1803	1900	1555	1805	3459		1805	3386	
Flt Permitted	0.55	1.00	1.00	0.62	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1019	1900	1526	1176	1900	1555	1805	3459		1805	3386	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	148	149	346	52	187	93	436	686	78	65	585	191
RTOR Reduction (vph)	0	0	254	0	0	68	0	8	0	0	29	0
Lane Group Flow (vph)	148	149	92	52	187	25	436	756	0	65	747	0
Confl. Peds. (#/hr)	22		46	2		34			36			10
Confl. Bikes (#/hr)			5			5			5			5
Heavy Vehicles (%)	2%	0%	1%	0%	0%	0%	0%	2%	0%	0%	2%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8		8	4		4						
Actuated Green, G (s)	21.5	21.5	21.5	21.5	21.5	21.5	24.2	36.7		12.0	24.3	
Effective Green, g (s)	21.5	21.5	21.5	21.5	21.5	21.5	24.2	36.7		12.0	24.3	
Actuated g/C Ratio	0.26	0.26	0.26	0.26	0.26	0.26	0.30	0.45		0.15	0.30	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	3.5	3.5		3.5	3.7	
Vehicle Extension (s)	4.0	4.0	4.0	4.0	4.0	4.0	2.5	3.0		2.5	3.0	
Lane Grp Cap (vph)	269	503	404	311	503	411	537	1563		266	1013	
v/s Ratio Prot		0.08			0.10		c0.24	0.22		0.04	c0.22	
v/s Ratio Perm	c0.15		0.06	0.04		0.02						
v/c Ratio	0.55	0.30	0.23	0.17	0.37	0.06	0.81	0.48		0.24	0.74	
Uniform Delay, d1	25.7	23.8	23.3	23.0	24.3	22.3	26.4	15.6		30.6	25.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.0	0.5	0.4	0.3	0.6	0.1	8.9	0.2		0.3	2.8	
Delay (s)	28.7	24.3	23.7	23.3	25.0	22.4	35.3	15.8		30.9	28.4	
Level of Service	C	C	C	C	C	C	D	B		C	C	
Approach Delay (s)		25.0			24.0			22.9			28.6	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM 2000 Control Delay	25.1	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.70			
Actuated Cycle Length (s)	81.2	Sum of lost time (s)	11.2	
Intersection Capacity Utilization	94.8%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	27.1
Intersection LOS	F

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations																
Traffic Vol, veh/h	0	105	172	56	0	77	345	198	0	69	132	61	0	185	235	460
Future Vol, veh/h	0	105	172	56	0	77	345	198	0	69	132	61	0	185	235	460
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	111	181	59	0	81	363	208	0	73	139	64	0	195	247	484
Number of Lanes	0	1	1	0	0	1	1	0	0	1	1	0	0	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	3	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	2	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	3	2	2
HCM Control Delay	33.8	273.5	29.6	88.3
HCM LOS	D	F	D	F

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%	0%
Vol Thru, %	0%	68%	0%	75%	0%	64%	0%	100%	0%
Vol Right, %	0%	32%	0%	25%	0%	36%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	69	193	105	228	77	543	185	235	460
LT Vol	69	0	105	0	77	0	185	0	0
Through Vol	0	132	0	172	0	345	0	235	0
RT Vol	0	61	0	56	0	198	0	0	460
Lane Flow Rate	73	203	111	240	81	572	195	247	484
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.233	0.61	0.345	0.704	0.244	1.602	0.544	0.657	1.192
Departure Headway (Hd)	13.273	12.499	12.829	12.119	11.346	10.561	11.417	10.889	10.152
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	272	291	282	300	319	349	317	334	363
Service Time	10.973	10.199	10.529	9.819	9.046	8.261	9.117	8.589	7.852
HCM Lane V/C Ratio	0.268	0.698	0.394	0.8	0.254	1.639	0.615	0.74	1.333
HCM Control Delay	20	33	22.1	39.2	17.7	309.8	26.9	32.2	141.6
HCM Lane LOS	C	D	C	E	C	F	D	D	F
HCM 95th-tile Q	0.9	3.7	1.5	4.9	0.9	32	3.1	4.4	17.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	105	172	56	77	345	198	69	132	61	185	235	460
Future Volume (vph)	105	172	56	77	345	198	69	132	61	185	235	460
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	4.0
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Frt	1.00	0.96		1.00	0.95		1.00	0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1770	1794		1770	1761		1770	1775		1770	1863	1583
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)	1770	1794		1770	1761		1770	1775		1770	1863	1583
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	111	181	59	81	363	208	73	139	64	195	247	484
RTOR Reduction (vph)	0	12	0	0	22	0	0	21	0	0	0	294
Lane Group Flow (vph)	111	228	0	81	549	0	73	182	0	195	247	190
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	Perm
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												6
Actuated Green, G (s)	7.1	29.0		6.5	28.4		4.6	14.5		11.6	21.5	21.5
Effective Green, g (s)	7.1	29.0		6.5	28.4		4.6	14.5		11.6	21.5	21.5
Actuated g/C Ratio	0.09	0.38		0.09	0.38		0.06	0.19		0.15	0.28	0.28
Clearance Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	4.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Lane Grp Cap (vph)	166	688		152	661		107	340		271	529	450
v/s Ratio Prot	c0.06	0.13		0.05	c0.31		0.04	0.10		c0.11	c0.13	
v/s Ratio Perm												0.12
v/c Ratio	0.67	0.33		0.53	0.83		0.68	0.54		0.72	0.47	0.42
Uniform Delay, d1	33.1	16.5		33.1	21.4		34.8	27.5		30.5	22.3	22.0
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	9.8	0.3		3.6	8.7		16.5	1.6		8.8	0.7	0.6
Delay (s)	42.9	16.7		36.7	30.2		51.2	29.1		39.3	23.0	22.6
Level of Service	D	B		D	C		D	C		D	C	C
Approach Delay (s)		25.0			31.0			35.0			26.2	
Approach LOS		C			C			C			C	

Intersection Summary				
HCM 2000 Control Delay	28.5	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.72			
Actuated Cycle Length (s)	75.6	Sum of lost time (s)	14.0	
Intersection Capacity Utilization	72.5%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

MOVEMENT SUMMARY

Site: 9 [PM Cumulative Alt]

Novato Boulevard/San Marin Dr-Sutro Ave
PM Cumulative with Project Alternative

Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NB Sutro Ave											
3	L2	73	2.0	0.338	8.3	LOS A	1.6	40.9	0.62	0.60	32.6
8	T1	139	2.0	0.338	8.3	LOS A	1.6	40.9	0.62	0.60	32.6
18	R2	64	2.0	0.338	8.3	LOS A	1.6	40.9	0.62	0.60	31.7
Approach		276	2.0	0.338	8.3	LOS A	1.6	40.9	0.62	0.60	32.4
East: WB Novato Blvd											
1	L2	81	2.0	0.674	14.4	LOS B	6.4	162.4	0.78	0.77	30.2
6	T1	363	2.0	0.674	14.4	LOS B	6.4	162.4	0.78	0.77	30.2
16	R2	208	2.0	0.674	14.4	LOS B	6.4	162.4	0.78	0.77	29.5
Approach		653	2.0	0.674	14.4	LOS B	6.4	162.4	0.78	0.77	30.0
North: SB San Marin Drive											
7	L2	195	2.0	0.513	11.1	LOS B	3.1	77.6	0.69	0.73	31.0
4	T1	247	2.0	0.513	11.1	LOS B	3.1	77.6	0.69	0.73	31.0
14	R2	484	2.0	0.562	12.2	LOS B	3.6	92.6	0.72	0.78	30.4
Approach		926	2.0	0.562	11.7	LOS B	3.6	92.6	0.70	0.76	30.7
West: EB Novato Blvd											
5	L2	111	2.0	0.447	10.5	LOS B	2.5	63.1	0.69	0.72	31.5
2	T1	181	2.0	0.447	10.5	LOS B	2.5	63.1	0.69	0.72	31.5
12	R2	59	2.0	0.447	10.5	LOS B	2.5	63.1	0.69	0.72	30.7
Approach		351	2.0	0.447	10.5	LOS B	2.5	63.1	0.69	0.72	31.4
All Vehicles		2205	2.0	0.674	11.9	LOS B	6.4	162.4	0.71	0.73	30.8

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

LANE SUMMARY

Site: 9 [PM Cumulative Alt]

Novato Boulevard/San Marin Dr-Sutro Ave
PM Cumulative with Project Alternative

Roundabout

Lane Use and Performance

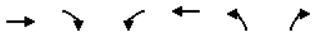
	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: NB Sutro Ave													
Lane 1[d]	276	2.0	816	0.338	100	8.3	LOS A	1.6	40.9	Full	1600	0.0	0.0
Approach	276	2.0		0.338		8.3	LOS A	1.6	40.9				
East: WB Novato Blvd													
Lane 1[d]	653	2.0	968	0.674	100	14.4	LOS B	6.4	162.4	Full	1600	0.0	0.0
Approach	653	2.0		0.674		14.4	LOS B	6.4	162.4				
North: SB San Marin Drive													
Lane 1	442	2.0	862	0.513	100	11.1	LOS B	3.1	77.6	Full	1600	0.0	0.0
Lane 2[d]	484	2.0	862	0.562	100	12.2	LOS B	3.6	92.6	Short	30	0.0	NA
Approach	926	2.0		0.562		11.7	LOS B	3.6	92.6				
West: EB Novato Blvd													
Lane 1[d]	351	2.0	785	0.447	100	10.5	LOS B	2.5	63.1	Full	1600	0.0	0.0
Approach	351	2.0		0.447		10.5	LOS B	2.5	63.1				
Intersection	2205	2.0		0.674		11.9	LOS B	6.4	162.4				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

HCM Signalized Intersection Capacity Analysis
10: Wilson Ave & Novato Blvd #2

06/13/2017



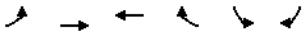
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	557	42	452	862	46	295
Future Volume (vph)	557	42	452	862	46	295
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.9		3.0	3.6	3.6	3.6
Lane Util. Factor	0.95		1.00	0.95	1.00	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	0.99
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.99		1.00	1.00	1.00	0.85
Flt Protected	1.00		0.95	1.00	0.95	1.00
Satd. Flow (prot)	3533		1787	3610	1805	1593
Flt Permitted	1.00		0.95	1.00	0.95	1.00
Satd. Flow (perm)	3533		1787	3610	1805	1593
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	586	44	476	907	48	311
RTOR Reduction (vph)	5	0	0	0	0	262
Lane Group Flow (vph)	625	0	476	907	48	49
Confl. Peds. (#/hr)		3			6	2
Heavy Vehicles (%)	1%	0%	1%	0%	0%	0%
Turn Type	NA		Prot	NA	Prot	Perm
Protected Phases	2		1	6	4	
Permitted Phases						4
Actuated Green, G (s)	30.9		19.3	38.3	11.3	11.3
Effective Green, g (s)	30.9		19.3	38.3	11.3	11.3
Actuated g/C Ratio	0.43		0.27	0.53	0.16	0.16
Clearance Time (s)	3.9		3.0	3.6	3.6	3.6
Vehicle Extension (s)	3.0		2.0	3.0	2.0	2.0
Lane Grp Cap (vph)	1516		479	1920	283	250
v/s Ratio Prot	c0.18		c0.27	c0.25	0.03	
v/s Ratio Perm						c0.03
v/c Ratio	0.41		0.99	0.47	0.17	0.20
Uniform Delay, d1	14.3		26.3	10.5	26.3	26.4
Progression Factor	1.00		0.93	0.47	1.00	1.00
Incremental Delay, d2	0.8		35.4	0.7	0.1	0.1
Delay (s)	15.1		59.9	5.6	26.4	26.5
Level of Service	B		E	A	C	C
Approach Delay (s)	15.1			24.3	26.5	
Approach LOS	B			C	C	

Intersection Summary				
HCM 2000 Control Delay	22.2	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.58			
Actuated Cycle Length (s)	72.0	Sum of lost time (s)	10.5	
Intersection Capacity Utilization	59.7%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
11: Novato Blvd #2 & Simmons Ln

06/13/2017



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	137	715	1028	106	113	296
Future Volume (vph)	137	715	1028	106	113	296
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.9	3.6		3.0	3.0
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.99		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	3574	3552		1805	1599
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1805	3574	3552		1805	1599
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	144	753	1082	112	119	312
RTOR Reduction (vph)	0	0	7	0	0	241
Lane Group Flow (vph)	144	753	1187	0	119	71
Confl. Peds. (#/hr)					2	
Confl. Bikes (#/hr)				1		
Heavy Vehicles (%)	0%	1%	0%	0%	0%	1%
Turn Type	Prot	NA	NA		Prot	Perm
Protected Phases	5	2	6		8	
Permitted Phases						8
Actuated Green, G (s)	12.2	30.9	38.3		11.9	11.9
Effective Green, g (s)	12.2	30.9	38.3		11.9	11.9
Actuated g/C Ratio	0.17	0.43	0.53		0.17	0.17
Clearance Time (s)	3.0	3.9	3.6		3.0	3.0
Vehicle Extension (s)	2.0	3.0	3.0		2.0	2.0
Lane Grp Cap (vph)	305	1533	1889		298	264
v/s Ratio Prot	0.08	c0.21	c0.33		c0.07	
v/s Ratio Perm						0.04
v/c Ratio	0.47	0.49	0.63		0.40	0.27
Uniform Delay, d1	27.0	14.9	11.8		26.9	26.2
Progression Factor	0.68	0.51	1.00		1.00	1.00
Incremental Delay, d2	4.8	1.1	1.6		0.3	0.2
Delay (s)	23.2	8.6	13.4		27.2	26.4
Level of Service	C	A	B		C	C
Approach Delay (s)		11.0	13.4		26.6	
Approach LOS		B	B		C	

Intersection Summary				
HCM 2000 Control Delay	14.8	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.58			
Actuated Cycle Length (s)	72.0	Sum of lost time (s)	10.5	
Intersection Capacity Utilization	56.8%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
12: Grant Ave & Novato Blvd #2

01/23/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	160	675	1	2	943	54	1	6	4	25	1	288
Future Volume (vph)	160	675	1	2	943	54	1	6	4	25	1	288
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.5	4.5	3.5	4.9	4.9		4.0		3.5	3.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	0.95	1.00		1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.95	1.00	1.00	0.96		0.98		1.00	0.98	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00		1.00		0.97	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85		0.95		1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		1.00		0.95	1.00	
Satd. Flow (prot)	1787	1863	1534	1805	3539	1529		1762		1737	1591	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.53		0.75	1.00	
Satd. Flow (perm)	1787	1863	1534	1805	3539	1529		947		1372	1591	
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)	167	703	1	2	982	56	1	6	4	26	1	300
RTOR Reduction (vph)	0	0	0	0	0	19	0	4	0	0	269	0
Lane Group Flow (vph)	167	703	1	2	982	37	0	7	0	26	32	0
Confl. Peds. (#/hr)			11			8	1		14	14		1
Confl. Bikes (#/hr)			1			4			2			1
Heavy Vehicles (%)	1%	2%	0%	0%	2%	1%	0%	0%	0%	1%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2			6	8			4		
Actuated Green, G (s)	14.6	86.1	86.1	1.2	72.3	72.3		10.7		11.2	11.2	
Effective Green, g (s)	14.6	86.1	86.1	1.2	72.3	72.3		10.7		11.2	11.2	
Actuated g/C Ratio	0.13	0.78	0.78	0.01	0.66	0.66		0.10		0.10	0.10	
Clearance Time (s)	3.5	4.5	4.5	3.5	4.9	4.9		4.0		3.5	3.5	
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0	3.0		2.0		2.0	2.0	
Lane Grp Cap (vph)	237	1458	1200	19	2326	1004		92		139	161	
v/s Ratio Prot	c0.09	c0.38		0.00	0.28						c0.02	
v/s Ratio Perm			0.00			0.02		0.01		0.02		
v/c Ratio	0.70	0.48	0.00	0.11	0.42	0.04		0.08		0.19	0.20	
Uniform Delay, d1	45.6	4.2	2.6	53.9	8.9	6.6		45.2		45.2	45.3	
Progression Factor	1.00	1.00	1.00	1.44	0.23	0.20		1.00		1.00	1.00	
Incremental Delay, d2	7.5	1.1	0.0	0.6	0.4	0.0		0.1		0.2	0.2	
Delay (s)	53.2	5.3	2.6	77.9	2.4	1.4		45.3		45.5	45.5	
Level of Service	D	A	A	E	A	A		D		D	D	
Approach Delay (s)		14.5			2.5			45.3			45.5	
Approach LOS		B			A			D			D	

Intersection Summary					
HCM 2000 Control Delay	13.6	HCM 2000 Level of Service	B		
HCM 2000 Volume to Capacity ratio	0.50				
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.4		
Intersection Capacity Utilization	69.1%	ICU Level of Service	C		
Analysis Period (min)	15				
c Critical Lane Group					

HCM Signalized Intersection Capacity Analysis
13: Tamalpais Ave/7th St & Novato Blvd #2

01/23/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	135	591	43	72	848	215	44	124	46	185	112	125
Future Volume (vph)	135	591	43	72	848	215	44	124	46	185	112	125
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	5.0		3.5	5.0	5.0	3.5	3.5		3.5	3.5	3.5
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.96	1.00	0.99		1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	0.99	1.00		0.99	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	0.96		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1787	1839		1787	1863	1542	1768	1782		1765	1881	1547
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.61	1.00		0.49	1.00	1.00
Satd. Flow (perm)	1787	1839		1787	1863	1542	1144	1782		918	1881	1547
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)	141	616	45	75	883	224	46	129	48	193	117	130
RTOR Reduction (vph)	0	2	0	0	0	33	0	13	0	0	0	101
Lane Group Flow (vph)	141	659	0	75	883	191	46	164	0	193	117	29
Confl. Peds. (#/hr)			10			6	5		7	7		5
Confl. Bikes (#/hr)			3			2			5			
Heavy Vehicles (%)	1%	2%	1%	1%	2%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA		Perm	NA	Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8			4		4
Actuated Green, G (s)	12.7	65.9		7.4	60.6	60.6	24.7	24.7		24.7	24.7	24.7
Effective Green, g (s)	12.7	65.9		7.4	60.6	60.6	24.7	24.7		24.7	24.7	24.7
Actuated g/C Ratio	0.12	0.60		0.07	0.55	0.55	0.22	0.22		0.22	0.22	0.22
Clearance Time (s)	3.5	5.0		3.5	5.0	5.0	3.5	3.5		3.5	3.5	3.5
Vehicle Extension (s)	2.0	5.0		2.0	5.0	5.0	2.0	2.0		2.0	2.0	2.0
Lane Grp Cap (vph)	206	1101		120	1026	849	256	400		206	422	347
v/s Ratio Prot	c0.08	0.36		0.04	c0.47			0.09			0.06	
v/s Ratio Perm						0.12	0.04			c0.21		0.02
v/c Ratio	0.68	0.60		0.62	0.86	0.22	0.18	0.41		0.94	0.28	0.08
Uniform Delay, d1	46.7	13.8		49.9	21.1	12.7	34.5	36.4		41.9	35.3	33.7
Progression Factor	0.89	1.13		1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	6.8	2.2		7.1	9.4	0.6	0.1	0.2		44.3	0.1	0.0
Delay (s)	48.6	17.8		57.1	30.5	13.3	34.6	36.7		86.2	35.4	33.7
Level of Service	D	B		E	C	B	C	D		F	D	C
Approach Delay (s)		23.2			28.9			36.2			57.2	
Approach LOS		C			C			D			E	

Intersection Summary					
HCM 2000 Control Delay	32.5	HCM 2000 Level of Service	C		
HCM 2000 Volume to Capacity ratio	0.86				
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0		
Intersection Capacity Utilization	88.6%	ICU Level of Service	E		
Analysis Period (min)	15				
c Critical Lane Group					

HCM Signalized Intersection Capacity Analysis
14: Diablo Ave & Novato Blvd #2

01/23/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	258	23	290	337	662	51	470	239	467	354	12
Future Volume (vph)	24	258	23	290	337	662	51	470	239	467	354	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	11	11	12	11	11	12	12	12	12
Total Lost time (s)		3.7		4.1	4.1	4.1	4.4	4.4	4.4	4.1	4.1	
Lane Util. Factor		0.95		0.91	0.91	1.00	1.00	1.00	1.00	0.91	0.91	
Frpb, ped/bikes		1.00		1.00	1.00	0.95	1.00	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	1.00	
Frt		0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected		1.00		0.95	0.99	1.00	0.95	1.00	1.00	0.95	0.98	
Satd. Flow (prot)		3513		1557	3269	1500	1728	1801	1560	1610	3320	
Flt Permitted		1.00		0.95	0.99	1.00	0.95	1.00	1.00	0.95	0.98	
Satd. Flow (perm)		3513		1557	3269	1500	1728	1801	1560	1610	3320	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	25	272	24	305	355	697	54	495	252	492	373	13
RTOR Reduction (vph)	0	5	0	0	0	283	0	0	146	0	1	0
Lane Group Flow (vph)	0	316	0	213	447	414	54	495	106	285	592	0
Confl. Peds. (#/hr)			10			15			2			3
Confl. Bikes (#/hr)			1			1						6
Heavy Vehicles (%)	1%	1%	1%	2%	1%	2%	1%	2%	2%	2%	2%	1%
Turn Type	Split	NA		Split	NA	Perm	Split	NA	Perm	Split	NA	
Protected Phases	3	3		4	4		1	1		2	2	
Permitted Phases						4			1		2	
Actuated Green, G (s)		16.0		29.1	29.1	29.1	32.2	32.2	32.2	25.0	25.0	
Effective Green, g (s)		16.0		29.1	29.1	29.1	32.2	32.2	32.2	25.0	25.0	
Actuated g/C Ratio		0.13		0.25	0.25	0.25	0.27	0.27	0.27	0.21	0.21	
Clearance Time (s)		3.7		4.1	4.1	4.1	4.4	4.4	4.4	4.1	4.1	
Vehicle Extension (s)		2.0		2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)		473		382	802	368	469	488	423	339	699	
v/s Ratio Prot		c0.09		0.14	0.14		0.03	c0.27		0.18	c0.18	
v/s Ratio Perm						c0.28			0.07			
v/c Ratio		0.67		0.56	0.56	1.13	0.12	1.01	0.25	0.84	0.85	
Uniform Delay, d1		48.8		39.1	39.1	44.8	32.5	43.2	33.8	44.9	45.0	
Progression Factor		1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		2.8		1.0	0.5	85.3	0.0	44.4	0.1	16.3	9.0	
Delay (s)		51.5		40.1	39.6	130.0	32.5	87.6	33.9	61.2	54.0	
Level of Service		D		D	D	F	C	F	C	E	D	
Approach Delay (s)		51.5			86.1			67.0			56.3	
Approach LOS		D			F			E			E	

Intersection Summary				
HCM 2000 Control Delay	70.5	HCM 2000 Level of Service	E	
HCM 2000 Volume to Capacity ratio	0.95			
Actuated Cycle Length (s)	118.6	Sum of lost time (s)	16.3	
Intersection Capacity Utilization	90.0%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
14: Diablo Ave & Novato Blvd #2

02/12/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	258	23	290	337	662	51	470	239	467	354	12
Future Volume (vph)	24	258	23	290	337	662	51	470	239	467	354	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	11	11	11	11	11	12	11	11	12	10	12	12
Total Lost time (s)	4.0	4.1	4.1	4.0	4.0	4.0	4.0	4.1		4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		0.97	1.00	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95		1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1728	1818	1511	1711	1818	1554	1728	3233		3204	1852	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1728	1818	1511	1711	1818	1554	1728	3233		3204	1852	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	25	272	24	305	355	697	54	495	252	492	373	13
RTOR Reduction (vph)	0	0	19	0	0	80	0	55	0	0	1	0
Lane Group Flow (vph)	25	272	5	305	355	617	54	692	0	492	385	0
Confl. Peds. (#/hr)			10			15			2			3
Confl. Bikes (#/hr)			1			1						6
Heavy Vehicles (%)	1%	1%	1%	2%	1%	2%	1%	2%	2%	2%	2%	1%
Turn Type	Prot	NA	Perm	Prot	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases	7	4		3	8	1	5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	4.9	20.2	20.2	23.0	38.4	56.7	6.5	26.3		18.3	38.2	
Effective Green, g (s)	4.9	20.2	20.2	23.0	38.4	56.7	6.5	26.3		18.3	38.2	
Actuated g/C Ratio	0.05	0.19	0.19	0.22	0.37	0.55	0.06	0.25		0.18	0.37	
Clearance Time (s)	4.0	4.1	4.1	4.0	4.0	4.0	4.0	4.1		4.0	4.0	
Vehicle Extension (s)	3.0	2.0	2.0	3.0	3.0	3.0	3.0	2.0		3.0	3.0	
Lane Grp Cap (vph)	81	353	293	378	671	847	108	817		563	680	
v/s Ratio Prot	0.01	0.15		c0.18	0.20	c0.13	0.03	c0.21		c0.15	0.21	
v/s Ratio Perm			0.00			0.27						
v/c Ratio	0.31	0.77	0.02	0.81	0.53	0.73	0.50	0.85		0.87	0.57	
Uniform Delay, d1	47.9	39.7	33.9	38.4	25.7	17.8	47.2	36.9		41.7	26.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.2	9.1	0.0	11.9	0.8	3.2	3.6	7.8		14.1	1.1	
Delay (s)	50.1	48.8	33.9	50.3	26.5	21.0	50.8	44.7		55.8	27.4	
Level of Service	D	D	C	D	C	C	D	D		E	C	
Approach Delay (s)		47.8			29.0			45.1			43.3	
Approach LOS		D			C			D			D	

Intersection Summary				
HCM 2000 Control Delay	38.4	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.83			
Actuated Cycle Length (s)	104.0	Sum of lost time (s)	16.2	
Intersection Capacity Utilization	81.6%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
15: Redwood Blvd & Diablo Ave/De Long Ave

06/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	293	590	111	109	983	421	142	328	87	358	248	252
Future Volume (vph)	293	590	111	109	983	421	142	328	87	358	248	252
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	9
Total Lost time (s)	4.0	3.7		4.0	4.1		3.5	4.8	4.8	3.5	3.5	3.5
Lane Util. Factor	0.97	0.95		1.00	0.95		1.00	0.95	1.00	0.97	1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98		1.00	0.95		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3467	3524		1805	3336		1805	3610	1508	3303	1900	1394
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3467	3524		1805	3336		1805	3610	1508	3303	1900	1394
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	299	602	113	111	1003	430	145	335	89	365	253	257
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	33	0	0	49
Lane Group Flow (vph)	299	715	0	111	1433	0	145	335	56	365	253	208
Confl. Peds. (#/hr)						2			7			14
Confl. Bikes (#/hr)												3
Heavy Vehicles (%)	1%	0%	0%	0%	2%	5%	0%	0%	5%	6%	0%	1%
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	8		7	4		5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)	17.1	59.7		17.0	59.2		14.6	23.4	23.4	13.9	24.0	24.0
Effective Green, g (s)	17.1	59.7		17.0	59.2		14.6	23.4	23.4	13.9	24.0	24.0
Actuated g/C Ratio	0.13	0.46		0.13	0.46		0.11	0.18	0.18	0.11	0.18	0.18
Clearance Time (s)	4.0	3.7		4.0	4.1		3.5	4.8	4.8	3.5	3.5	3.5
Vehicle Extension (s)	2.5	2.0		2.0	2.0		2.0	2.0	2.0	2.0	2.0	2.0
Lane Grp Cap (vph)	456	1618		236	1519		202	649	271	353	350	257
v/s Ratio Prot	c0.09	0.20		0.06	c0.43		0.08	0.09		c0.11	0.13	
v/s Ratio Perm									0.04			c0.15
v/c Ratio	0.66	0.44		0.47	0.94		0.72	0.52	0.21	1.03	0.72	0.81
Uniform Delay, d1	53.7	23.8		52.3	33.8		55.7	48.2	45.4	58.0	49.9	50.8
Progression Factor	1.00	1.00		1.44	0.56		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.0	0.9		0.3	8.1		9.7	0.3	0.1	57.0	6.1	16.1
Delay (s)	56.7	24.7		75.6	27.0		65.4	48.5	45.5	115.0	56.0	66.9
Level of Service	E	C		E	C		E	D	D	F	E	E
Approach Delay (s)		34.1			30.5			52.3			83.8	
Approach LOS		C			C			D			F	

Intersection Summary			
HCM 2000 Control Delay	46.2	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.89		
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	16.4
Intersection Capacity Utilization	97.9%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
16: Reichert Ave & De Long Ave

06/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	87	907	23	100	1380	357	19	32	60	257	19	83
Future Volume (vph)	87	907	23	100	1380	357	19	32	60	257	19	83
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.1		3.0	4.1		3.5	3.5	3.5	3.5	3.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	0.99		1.00	1.00	0.98	1.00	0.98	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		0.99	1.00	1.00	0.99	1.00	
Frt	1.00	1.00		1.00	0.97		1.00	1.00	0.85	1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1805	3525		1805	3427		1794	1900	1577	1763	1636	
Flt Permitted	0.95	1.00		0.95	1.00		0.62	1.00	1.00	0.73	1.00	
Satd. Flow (perm)	1805	3525		1805	3427		1170	1900	1577	1364	1636	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	92	955	24	105	1453	376	20	34	63	271	20	87
RTOR Reduction (vph)	0	1	0	0	14	0	0	0	15	0	28	0
Lane Group Flow (vph)	92	978	0	105	1815	0	20	34	48	271	79	0
Confl. Peds. (#/hr)			5			11	5		5	11		5
Confl. Bikes (#/hr)			5			5			5			5
Heavy Vehicles (%)	0%	2%	0%	0%	1%	1%	0%	0%	0%	1%	0%	0%
Turn Type	Prot	NA		Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8		8	4		
Actuated Green, G (s)	11.0	79.4		11.0	79.4		29.0	29.0	29.0	29.0	29.0	
Effective Green, g (s)	11.0	79.4		11.0	79.4		29.0	29.0	29.0	29.0	29.0	
Actuated g/C Ratio	0.08	0.61		0.08	0.61		0.22	0.22	0.22	0.22	0.22	
Clearance Time (s)	3.0	4.1		3.0	4.1		3.5	3.5	3.5	3.5	3.5	
Vehicle Extension (s)	2.0	3.0		2.0	3.0		2.0	2.0	2.0	2.0	2.0	
Lane Grp Cap (vph)	152	2152		152	2093		261	423	351	304	364	
v/s Ratio Prot	0.05	0.28		c0.06	c0.53			0.02			0.05	
v/s Ratio Perm							0.02		0.03	c0.20		
v/c Ratio	0.61	0.45		0.69	0.87		0.08	0.08	0.14	0.89	0.22	
Uniform Delay, d1	57.4	13.6		57.8	20.9		39.9	40.0	40.5	49.0	41.2	
Progression Factor	0.72	1.19		1.01	0.68		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.6	0.5		8.1	4.0		0.0	0.0	0.1	25.6	0.1	
Delay (s)	44.9	16.7		66.3	18.3		40.0	40.0	40.5	74.6	41.3	
Level of Service	D	B		E	B		D	D	D	E	D	
Approach Delay (s)		19.2			20.9			40.3			65.2	
Approach LOS		B			C			D			E	

Intersection Summary				
HCM 2000 Control Delay	25.8	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.86			
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	10.6	
Intersection Capacity Utilization	88.5%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
17: US 101 SB Ramps & De Long Ave

06/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	223	1042	28	1775	0	0	0	0	10	7	187
Future Volume (vph)	0	223	1042	28	1775	0	0	0	0	10	7	187
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.6	3.6	3.0	3.6					4.0	4.0	
Lane Util. Factor		0.95	1.00	1.00	0.95					0.95	0.95	
Frt		1.00	0.85	1.00	1.00					1.00	0.86	
Flt Protected		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (prot)		3574	1599	1770	3539					1681	1514	
Flt Permitted		1.00	1.00	0.95	1.00					0.95	1.00	
Satd. Flow (perm)		3574	1599	1770	3539					1681	1514	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	228	1063	29	1811	0	0	0	0	10	7	191
RTOR Reduction (vph)	0	0	277	0	0	0	0	0	0	0	39	0
Lane Group Flow (vph)	0	228	786	29	1811	0	0	0	0	9	160	0
Heavy Vehicles (%)	0%	1%	1%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Turn Type		NA	Perm	Prot	NA					Split	NA	
Protected Phases		6		5	2					4	4	
Permitted Phases			6									
Actuated Green, G (s)		91.8	91.8	9.3	104.1					18.3	18.3	
Effective Green, g (s)		91.8	91.8	9.3	104.1					18.3	18.3	
Actuated g/C Ratio		0.71	0.71	0.07	0.80					0.14	0.14	
Clearance Time (s)		3.6	3.6	3.0	3.6					4.0	4.0	
Vehicle Extension (s)		4.0	4.0	2.0	4.0					2.5	2.5	
Lane Grp Cap (vph)		2523	1129	126	2833					236	213	
v/s Ratio Prot		0.06		0.02	c0.51					0.01	c0.11	
v/s Ratio Perm			c0.49									
v/c Ratio		0.09	0.70	0.23	0.64					0.04	0.75	
Uniform Delay, d1		6.0	11.0	57.0	5.3					48.2	53.7	
Progression Factor		0.78	4.55	0.86	0.53					1.00	1.00	
Incremental Delay, d2		0.1	3.1	0.2	0.7					0.0	13.3	
Delay (s)		4.7	53.3	49.1	3.5					48.3	67.0	
Level of Service		A	D	D	A					D	E	
Approach Delay (s)		44.8			4.2			0.0			66.2	
Approach LOS		D			A			A			E	

Intersection Summary				
HCM 2000 Control Delay	23.8	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.71			
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	10.6	
Intersection Capacity Utilization	131.5%	ICU Level of Service	H	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
18: US 101 NB Ramps & De Long Ave

06/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	190	45	0	0	63	29	1727	25	33	0	0	0
Future Volume (vph)	190	45	0	0	63	29	1727	25	33	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.6			3.6		4.5	4.5				
Lane Util. Factor	1.00	0.95			0.95		0.95	0.95				
Frpb, ped/bikes	1.00	1.00			1.00		1.00	1.00				
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00				
Frt	1.00	1.00			0.95		1.00	0.99				
Flt Protected	0.95	1.00			1.00		0.95	0.96				
Satd. Flow (prot)	1770	3610			3353		1698	1695				
Flt Permitted	0.95	1.00			1.00		0.95	0.96				
Satd. Flow (perm)	1770	3610			3353		1698	1695				
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)	198	47	0	0	66	30	1799	26	34	0	0	0
RTOR Reduction (vph)	0	0	0	0	28	0	0	1	0	0	0	0
Lane Group Flow (vph)	198	47	0	0	68	0	935	923	0	0	0	0
Confl. Peds. (#/hr)						1						
Heavy Vehicles (%)	2%	0%	0%	0%	0%	7%	1%	0%	6%	0%	0%	0%
Turn Type	Prot	NA			NA		Split	NA				
Protected Phases	1	6			2		4	4				
Permitted Phases												
Actuated Green, G (s)	16.1	27.9			8.3		94.0	94.0				
Effective Green, g (s)	16.1	27.9			8.3		94.0	94.0				
Actuated g/C Ratio	0.12	0.21			0.06		0.72	0.72				
Clearance Time (s)	3.5	3.6			3.6		4.5	4.5				
Vehicle Extension (s)	2.5	2.0			2.0		3.0	3.0				
Lane Grp Cap (vph)	219	774			214		1227	1225				
v/s Ratio Prot	c0.11	0.01			c0.02		c0.55	0.54				
v/s Ratio Perm												
v/c Ratio	0.90	0.06			0.32		0.76	0.75				
Uniform Delay, d1	56.2	40.6			58.1		11.1	11.0				
Progression Factor	1.08	1.01			1.00		1.00	1.00				
Incremental Delay, d2	35.6	0.0			0.3		4.5	4.3				
Delay (s)	96.0	41.2			58.5		15.6	15.3				
Level of Service	F	D			E		B	B				
Approach Delay (s)		85.5			58.5			15.4			0.0	
Approach LOS		F			E			B			A	

Intersection Summary				
HCM 2000 Control Delay	25.1	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.75			
Actuated Cycle Length (s)	130.0	Sum of lost time (s)	11.6	
Intersection Capacity Utilization	131.5%	ICU Level of Service	H	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
19: Redwood Blvd & Lamont Ave

06/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	4	24	48	3	57	22	525	63	74	453	16
Future Volume (vph)	33	4	24	48	3	57	22	525	63	74	453	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	3.5		3.5	3.5	3.5	4.8		3.5	4.8	4.8
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	1.00
Frpb, ped/bikes		1.00	1.00		1.00	0.99	1.00	1.00		1.00	1.00	1.00
Flpb, ped/bikes		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85		1.00	0.85	1.00	0.98		1.00	1.00	0.85
Flt Protected		0.96	1.00		0.95	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1818	1615		1814	1595	1805	3544		1805	3610	1615
Flt Permitted		0.79	1.00		0.77	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1504	1615		1461	1595	1805	3544		1805	3610	1615
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	35	4	25	51	3	60	23	553	66	78	477	17
RTOR Reduction (vph)	0	0	19	0	0	46	0	8	0	0	0	8
Lane Group Flow (vph)	0	39	6	0	54	14	23	611	0	78	477	9
Confl. Peds. (#/hr)	1					1			2			
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Prot	NA		Prot	NA	Perm
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8		8	4		4						2
Actuated Green, G (s)		12.2	12.2		12.2	12.2	1.0	22.7		5.4	27.1	27.1
Effective Green, g (s)		12.2	12.2		12.2	12.2	1.0	22.7		5.4	27.1	27.1
Actuated g/C Ratio		0.23	0.23		0.23	0.23	0.02	0.44		0.10	0.52	0.52
Clearance Time (s)		3.5	3.5		3.5	3.5	3.5	4.8		3.5	4.8	4.8
Vehicle Extension (s)		2.0	2.0		2.0	2.0	2.0	3.0		2.0	3.0	3.0
Lane Grp Cap (vph)		352	378		342	373	34	1544		187	1877	840
v/s Ratio Prot							0.01	c0.17		c0.04	0.13	
v/s Ratio Perm		0.03	0.00		c0.04	0.01						0.01
v/c Ratio		0.11	0.02		0.16	0.04	0.68	0.40		0.42	0.25	0.01
Uniform Delay, d1		15.7	15.3		15.9	15.4	25.4	10.0		21.9	6.9	6.0
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		0.1	0.0		0.1	0.0	34.5	0.2		0.5	0.1	0.0
Delay (s)		15.7	15.3		15.9	15.4	59.9	10.2		22.4	7.0	6.0
Level of Service		B	B		B	B	E	B		C	A	A
Approach Delay (s)		15.6			15.7			12.0			9.1	
Approach LOS		B			B			B			A	

Intersection Summary				
HCM 2000 Control Delay	11.2	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.33			
Actuated Cycle Length (s)	52.1	Sum of lost time (s)	11.8	
Intersection Capacity Utilization	46.7%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
20: Redwood Blvd & Landing Ct

06/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	3	30	0	27	1	592	27	18	572	1
Future Volume (vph)	0	0	3	30	0	27	1	592	27	18	572	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5		3.5		3.5		4.8	4.8	3.5	4.8	4.8
Lane Util. Factor		1.00		1.00		1.00		0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes		0.99		1.00		1.00		1.00	0.98	1.00	1.00	0.97
Flpb, ped/bikes		1.00		1.00		1.00		1.00	1.00	1.00	1.00	1.00
Frt		0.86		1.00		0.85		1.00	0.85	1.00	1.00	0.85
Flt Protected		1.00		0.95		1.00		1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1622		1802		1615		3610	1579	1805	3610	1571
Flt Permitted		1.00		0.76		1.00		0.95	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1622		1434		1615		3446	1579	1805	3610	1571
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	3	32	0	28	1	623	28	19	602	1
RTOR Reduction (vph)	0	3	0	0	0	24	0	0	12	0	0	0
Lane Group Flow (vph)	0	0	0	32	0	4	0	624	16	19	602	1
Confl. Peds. (#/hr)			4	4					3			6
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type		NA		Perm		Perm	Perm	NA	Perm	Prot	NA	Perm
Protected Phases		4						2		1	6	
Permitted Phases	4			8		8	2		2			6
Actuated Green, G (s)		7.0		7.0		7.0		28.0	28.0	0.8	32.3	32.3
Effective Green, g (s)		7.0		7.0		7.0		28.0	28.0	0.8	32.3	32.3
Actuated g/C Ratio		0.15		0.15		0.15		0.59	0.59	0.02	0.68	0.68
Clearance Time (s)		3.5		3.5		3.5		4.8	4.8	3.5	4.8	4.8
Vehicle Extension (s)		3.0		2.0		2.0		4.0	4.0	2.0	4.0	4.0
Lane Grp Cap (vph)		238		210		237		2027	928	30	2449	1066
v/s Ratio Prot		0.00								c0.01	0.17	
v/s Ratio Perm				c0.02		0.00		c0.18	0.01			0.00
v/c Ratio		0.00		0.15		0.02		0.31	0.02	0.63	0.25	0.00
Uniform Delay, d1		17.3		17.7		17.4		4.9	4.1	23.3	3.0	2.5
Progression Factor		1.00		1.00		1.00		1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		0.0		0.1		0.0		0.1	0.0	27.8	0.1	0.0
Delay (s)		17.3		17.8		17.4		5.0	4.1	51.1	3.0	2.5
Level of Service		B		B		B		A	A	D	A	A
Approach Delay (s)		17.3			17.6			5.0			4.5	
Approach LOS		B			B			A			A	

Intersection Summary				
HCM 2000 Control Delay	5.4	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.28			
Actuated Cycle Length (s)	47.6	Sum of lost time (s)	11.8	
Intersection Capacity Utilization	42.6%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
21: Novato Blvd #3 & Center Rd/Garden Ct

06/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	155	1	205	4	2	2	207	605	5	2	582	102
Future Volume (vph)	155	1	205	4	2	2	207	605	5	2	582	102
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.2	3.2			3.0		3.0	4.4		3.0	4.4	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.85			0.97		1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1805	1616			1791		1805	3605		1805	3483	
Flt Permitted	0.75	1.00			0.90		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1430	1616			1655		1805	3605		1805	3483	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	163	1	216	4	2	2	218	637	5	2	613	107
RTOR Reduction (vph)	0	179	0	0	2	0	0	0	0	0	10	0
Lane Group Flow (vph)	163	38	0	0	6	0	218	642	0	2	710	0
Confl. Peds. (#/hr)									9			6
Confl. Bikes (#/hr)									2			
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		8			4		1	6		5	2	
Permitted Phases	8			4								
Actuated Green, G (s)	16.9	16.9			17.1		16.4	70.3		2.2	56.1	
Effective Green, g (s)	16.9	16.9			17.1		16.4	70.3		2.2	56.1	
Actuated g/C Ratio	0.17	0.17			0.17		0.16	0.70		0.02	0.56	
Clearance Time (s)	3.2	3.2			3.0		3.0	4.4		3.0	4.4	
Vehicle Extension (s)	3.0	3.0			2.0		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)	241	273			283		296	2534		39	1953	
v/s Ratio Prot		0.02					c0.12	0.18		0.00	c0.20	
v/s Ratio Perm	c0.11				0.00							
v/c Ratio	0.68	0.14			0.02		0.74	0.25		0.05	0.36	
Uniform Delay, d1	39.0	35.3			34.5		39.7	5.4		47.9	12.1	
Progression Factor	1.00	1.00			1.00		0.92	1.45		1.00	1.00	
Incremental Delay, d2	7.3	0.2			0.0		7.7	0.2		0.2	0.5	
Delay (s)	46.3	35.6			34.5		44.1	8.0		48.1	12.6	
Level of Service	D	D			C		D	A		D	B	
Approach Delay (s)		40.2			34.5			17.2			12.7	
Approach LOS		D			C			B			B	

Intersection Summary				
HCM 2000 Control Delay	20.0	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.49			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.6	
Intersection Capacity Utilization	56.4%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
22: Novato Blvd #3 & Arthur Street

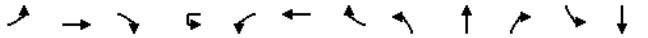
06/13/2017

Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Volume (vph)	93	128	158	882	7	749	87
Future Volume (vph)	93	128	158	882	7	749	87
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5	3.5	4.9	3.5	4.9	
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	0.95	
Frpb, ped/bikes	1.00	0.98	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	1.00	0.98	
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (prot)	1797	1589	1805	3574	1805	3553	
Flt Permitted	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (perm)	1797	1589	1805	3574	1805	3553	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	98	135	166	928	7	788	92
RTOR Reduction (vph)	0	118	0	0	0	5	0
Lane Group Flow (vph)	98	17	166	928	7	875	0
Confl. Peds. (#/hr)	4	2					
Confl. Bikes (#/hr)		1					
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%	0%
Turn Type	Perm	Perm	Prot	NA	Prot	NA	
Protected Phases			1	6	5	2	
Permitted Phases	4	4					
Actuated Green, G (s)	12.5	12.5	13.7	74.4	1.2	61.9	
Effective Green, g (s)	12.5	12.5	13.7	74.4	1.2	61.9	
Actuated g/C Ratio	0.12	0.12	0.14	0.74	0.01	0.62	
Clearance Time (s)	3.5	3.5	3.5	4.9	3.5	4.9	
Vehicle Extension (s)	2.0	2.0	2.0	4.0	2.0	4.0	
Lane Grp Cap (vph)	224	198	247	2659	21	2199	
v/s Ratio Prot			c0.09	0.26	0.00	c0.25	
v/s Ratio Perm	c0.05	0.01					
v/c Ratio	0.44	0.09	0.67	0.35	0.33	0.40	
Uniform Delay, d1	40.5	38.7	41.0	4.4	49.0	9.6	
Progression Factor	1.00	1.00	0.86	1.22	0.83	1.10	
Incremental Delay, d2	0.5	0.1	3.6	0.2	3.3	0.5	
Delay (s)	41.0	38.8	39.0	5.6	43.9	11.1	
Level of Service	D	D	D	A	D	B	
Approach Delay (s)	39.7			10.7		11.3	
Approach LOS	D			B		B	

Intersection Summary				
HCM 2000 Control Delay	14.0	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.45			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.9	
Intersection Capacity Utilization	49.3%	ICU Level of Service	A	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
23: Novato Blvd #3 & Rowland Boulevard

06/13/2017



Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	40	128	16	28	240	203	616	28	363	188	448	388
Future Volume (vph)	40	128	16	28	240	203	616	28	363	188	448	388
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	3.5			3.5	4.1	4.1	3.5	4.1		3.5	4.4
Lane Util. Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00		0.97	1.00
Frpb, ped/bikes	1.00	0.99			1.00	1.00	0.99	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	1.00
Frt	1.00	0.98			1.00	1.00	0.85	1.00	0.95		1.00	0.98
Flt Protected	0.95	1.00			0.95	1.00	1.00	0.95	1.00		0.95	1.00
Satd. Flow (prot)	1805	1858			1789	1900	1592	1805	1774		3502	1852
Flt Permitted	0.95	1.00			0.95	1.00	1.00	0.95	1.00		0.95	1.00
Satd. Flow (perm)	1805	1858			1789	1900	1592	1805	1774		3502	1852
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	42	135	17	29	253	214	648	29	382	198	472	408
RTOR Reduction (vph)	0	5	0	0	0	0	389	0	17	0	0	5
Lane Group Flow (vph)	42	147	0	0	282	214	259	29	563	0	472	470
Confl. Peds. (#/hr)			13				2			5		
Confl. Bikes (#/hr)			1							1		
Heavy Vehicles (%)	0%	0%	0%	0%	1%	0%	0%	0%	1%	1%	0%	0%
Turn Type	Prot	NA		Prot	Prot	NA	Perm	Prot	NA		Prot	NA
Protected Phases	3	8		7	7	4		1	6		5	2
Permitted Phases							4					
Actuated Green, G (s)	5.6	16.4			15.5	25.7	25.7	6.0	38.3		15.2	47.2
Effective Green, g (s)	5.6	16.4			15.5	25.7	25.7	6.0	38.3		15.2	47.2
Actuated g/C Ratio	0.06	0.16			0.16	0.26	0.26	0.06	0.38		0.15	0.47
Clearance Time (s)	3.5	3.5			3.5	4.1	4.1	3.5	4.1		3.5	4.4
Vehicle Extension (s)	2.0	2.0			2.0	2.0	2.0	2.0	3.0		2.0	2.0
Lane Grp Cap (vph)	101	304			277	488	409	108	679		532	874
v/s Ratio Prot	0.02	c0.08			c0.16	0.11		0.02	c0.32		c0.13	0.25
v/s Ratio Perm							c0.16					
v/c Ratio	0.42	0.48			1.02	0.44	0.63	0.27	0.83		0.89	0.54
Uniform Delay, d1	45.6	38.0			42.2	31.1	33.0	44.9	27.9		41.6	18.7
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00		0.70	0.54
Incremental Delay, d2	1.0	0.4			58.8	0.2	2.3	0.5	8.3		18.5	2.2
Delay (s)	46.6	38.4			101.0	31.3	35.3	45.4	36.2		47.4	12.4
Level of Service	D	D			F	C	D	D	D		D	B
Approach Delay (s)		40.2				50.8			36.6			29.8
Approach LOS		D				D			D			C

Intersection Summary				
HCM 2000 Control Delay	40.2	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.84			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.5	
Intersection Capacity Utilization	86.8%	ICU Level of Service	E	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
23: Novato Blvd #3 & Rowland Boulevard

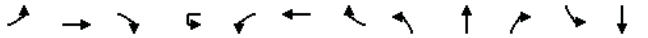
06/13/2017

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	64
Future Volume (vph)	64
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.95
Adj. Flow (vph)	67
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	6
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	0%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary			

HCM Signalized Intersection Capacity Analysis
24: Rowland Boulevard & Redwood Blvd

06/13/2017



Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations												
Traffic Volume (vph)	116	654	49	1	142	977	453	24	30	64	432	27
Future Volume (vph)	116	654	49	1	142	977	453	24	30	64	432	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.5	4.5		3.5	4.5		3.5	4.1		3.5	4.8
Lane Util. Factor	1.00	0.95	1.00		1.00	0.95		1.00	0.95		0.97	1.00
Frpb, ped/bikes	1.00	1.00	0.98		1.00	1.00		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	1.00
Frt	1.00	1.00	0.85		1.00	0.95		1.00	0.90		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00		0.95	1.00		0.95	1.00
Satd. Flow (prot)	1805	3574	1590		1805	3422		1805	3209		3502	1900
Flt Permitted	0.95	1.00	1.00		0.95	1.00		0.95	1.00		0.95	1.00
Satd. Flow (perm)	1805	3574	1590		1805	3422		1805	3209		3502	1900
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	122	688	52	1	149	1028	477	25	32	67	455	28
RTOR Reduction (vph)	0	0	31	0	0	41	0	0	57	0	0	0
Lane Group Flow (vph)	122	688	21	0	150	1464	0	25	42	0	455	28
Confl. Peds. (#/hr)			4				4			3		
Confl. Bikes (#/hr)										1		
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	Prot	NA		Prot	NA		Prot	NA
Protected Phases	5	2		1	1	6		3	8		7	4
Permitted Phases			2									
Actuated Green, G (s)	11.2	38.2	38.2		12.7	39.7		4.0	13.9		12.8	22.0
Effective Green, g (s)	11.2	38.2	38.2		12.7	39.7		4.0	13.9		12.8	22.0
Actuated g/C Ratio	0.12	0.41	0.41		0.14	0.43		0.04	0.15		0.14	0.24
Clearance Time (s)	3.5	4.5	4.5		3.5	4.5		3.5	4.1		3.5	4.8
Vehicle Extension (s)	2.0	4.0	4.0		2.0	4.0		2.0	2.5		2.5	2.5
Lane Grp Cap (vph)	216	1464	651		245	1457		77	478		480	448
v/s Ratio Prot	0.07	0.19			c0.08	c0.43		0.01	0.01		c0.13	0.01
v/s Ratio Perm			0.01									
v/c Ratio	0.56	0.47	0.03		0.61	1.00		0.32	0.09		0.95	0.06
Uniform Delay, d1	38.7	20.1	16.4		37.9	26.8		43.3	34.2		39.9	27.6
Progression Factor	1.00	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	2.0	0.3	0.0		3.2	24.7		0.9	0.1		28.1	0.0
Delay (s)	40.7	20.4	16.5		41.1	51.4		44.2	34.2		67.9	27.6
Level of Service	D	C	B		D	D		D	C		E	C
Approach Delay (s)		23.1				50.5			36.2			56.4
Approach LOS		C				D			D			E

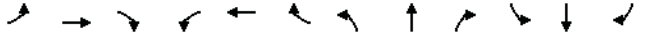
Intersection Summary			
HCM 2000 Control Delay	43.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	93.2	Sum of lost time (s)	16.3
Intersection Capacity Utilization	81.4%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

HCM Signalized Intersection Capacity Analysis
24: Rowland Boulevard & Redwood Blvd 06/13/2017

Movement	SBR
Lane Configurations	
Traffic Volume (vph)	148
Future Volume (vph)	148
Ideal Flow (vphpl)	1900
Total Lost time (s)	4.8
Lane Util. Factor	1.00
Frpb, ped/bikes	0.99
Flpb, ped/bikes	1.00
Frt	0.85
Flt Protected	1.00
Satd. Flow (prot)	1593
Flt Permitted	1.00
Satd. Flow (perm)	1593
Peak-hour factor, PHF	0.95
Adj. Flow (vph)	156
RTOR Reduction (vph)	119
Lane Group Flow (vph)	37
Confl. Peds. (#/hr)	2
Confl. Bikes (#/hr)	
Heavy Vehicles (%)	0%
Turn Type	Perm
Protected Phases	
Permitted Phases	4
Actuated Green, G (s)	22.0
Effective Green, g (s)	22.0
Actuated g/C Ratio	0.24
Clearance Time (s)	4.8
Vehicle Extension (s)	2.5
Lane Grp Cap (vph)	376
v/s Ratio Prot	
v/s Ratio Perm	c0.02
v/c Ratio	0.10
Uniform Delay, d1	27.8
Progression Factor	1.00
Incremental Delay, d2	0.1
Delay (s)	27.9
Level of Service	C
Approach Delay (s)	
Approach LOS	

Intersection Summary			

HCM Signalized Intersection Capacity Analysis
25: Rowland Boulevard & Highway 101 SB Ramps 06/13/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	545	613	765	1357	0	0	0	0	321	6	186
Future Volume (vph)	0	545	613	765	1357	0	0	0	0	321	6	186
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0	3.0	4.0					3.0	3.0	
Lane Util. Factor		0.91	0.91	0.97	0.95					0.91	0.91	
Frpb, ped/bikes		1.00	0.99	1.00	1.00					1.00	0.99	
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	
Frt		0.95	0.85	1.00	1.00					1.00	0.92	
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.98	
Satd. Flow (prot)		3258	1450	3502	3610					1643	3057	
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.98	
Satd. Flow (perm)		3258	1450	3502	3610					1643	3057	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	574	645	805	1428	0	0	0	0	338	6	196
RTOR Reduction (vph)	0	53	245	0	0	0	0	0	0	0	12	0
Lane Group Flow (vph)	0	785	136	805	1428	0	0	0	0	189	339	0
Confl. Peds. (#/hr)			2									7
Confl. Bikes (#/hr)												1
Heavy Vehicles (%)	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	33%	0%
Turn Type		NA	Perm	Prot	NA					Split	NA	
Protected Phases		2		1	6					4	4	
Permitted Phases			2									
Actuated Green, G (s)		20.7	20.7	13.4	37.1					13.8	13.8	
Effective Green, g (s)		20.7	20.7	13.4	37.1					13.8	13.8	
Actuated g/C Ratio		0.36	0.36	0.23	0.64					0.24	0.24	
Clearance Time (s)		4.0	4.0	3.0	4.0					3.0	3.0	
Vehicle Extension (s)		4.0	4.0	2.0	2.5					2.0	2.0	
Lane Grp Cap (vph)		1164	518	810	2313					391	728	
v/s Ratio Prot		0.24		c0.23	c0.40					c0.12	0.11	
v/s Ratio Perm			0.09									
v/c Ratio		0.67	0.26	0.99	0.62					0.48	0.47	
Uniform Delay, d1		15.7	13.2	22.2	6.2					19.0	18.9	
Progression Factor		1.00	1.00	1.00	1.00					1.00	1.00	
Incremental Delay, d2		1.7	0.4	29.9	0.4					0.3	0.2	
Delay (s)		17.5	13.6	52.1	6.6					19.3	19.1	
Level of Service		B	B	D	A					B	B	
Approach Delay (s)		16.2			23.0			0.0			19.2	
Approach LOS		B			C			A			B	

Intersection Summary					
HCM 2000 Control Delay	20.4	HCM 2000 Level of Service		C	
HCM 2000 Volume to Capacity ratio	0.72				
Actuated Cycle Length (s)	57.9	Sum of lost time (s)		10.0	
Intersection Capacity Utilization	72.0%	ICU Level of Service		C	
Analysis Period (min)	15				
c Critical Lane Group					

Movement	EBL2	EBL	EBT	WBT	WBR	WBR2	NBL2	NBL	NBT	NBR	NEL2	NEL
Lane Configurations												
Traffic Volume (vph)	4	99	776	1266	2	517	830	15	2	801	20	20
Future Volume (vph)	4	99	776	1266	2	517	830	15	2	801	20	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.0	4.0	4.0		4.0	3.5		3.5	3.0		3.5
Lane Util. Factor		1.00	0.95	0.86		0.86	0.95		0.95	0.88		1.00
Frpb, ped/bikes		1.00	1.00	1.00		1.00	1.00		1.00	1.00		1.00
Flpb, ped/bikes		1.00	1.00	1.00		1.00	1.00		1.00	1.00		1.00
Frt		1.00	1.00	0.99		0.85	1.00		1.00	0.85		0.98
Flt Protected		0.95	1.00	1.00		1.00	0.95		0.95	1.00		0.96
Satd. Flow (prot)		1804	3574	4640		1323	1715		1717	2842		1742
Flt Permitted		0.95	1.00	1.00		1.00	0.95		0.95	1.00		0.96
Satd. Flow (perm)		1804	3574	4640		1323	1715		1717	2842		1742
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	4	104	817	1333	2	544	874	16	2	843	21	21
RTOR Reduction (vph)	0	0	0	8	0	214	0	0	0	0	0	0
Lane Group Flow (vph)	0	108	817	1452	0	205	446	0	446	843	0	48
Confl. Peds. (#/hr)					1					8		
Heavy Vehicles (%)	2%	0%	1%	4%	0%	5%	0%	2%	13%	0%	2%	0%
Turn Type	Prot	Prot	NA	NA		Perm	Split	Split	NA	custom	Perm	Prot
Protected Phases	5	5	2	6			8	8	8	1 8		7
Permitted Phases						6					7	
Actuated Green, G (s)		10.2	48.5	49.8		49.8	37.2		37.2	48.7		8.8
Effective Green, g (s)		10.2	48.5	49.8		49.8	37.2		37.2	48.7		8.8
Actuated g/C Ratio		0.08	0.40	0.41		0.41	0.31		0.31	0.41		0.07
Clearance Time (s)		3.0	4.0	4.0		4.0	3.5		3.5			3.5
Vehicle Extension (s)		2.0	2.0	2.0		2.0	2.0		2.0			2.0
Lane Grp Cap (vph)		153	1444	1925		549	531		532	1153		127
v/s Ratio Prot		0.06	0.23	c0.31			c0.26		0.26	c0.30		
v/s Ratio Perm						0.15						0.03
v/c Ratio		0.71	0.57	0.75		0.37	0.84		0.84	0.73		0.38
Uniform Delay, d1		53.4	27.6	29.9		24.3	38.6		38.6	30.1		53.0
Progression Factor		1.00	1.00	0.90		1.28	1.00		1.00	1.00		1.00
Incremental Delay, d2		11.4	1.6	2.4		1.6	10.7		10.6	2.1		0.7
Delay (s)		64.9	29.2	29.3		32.7	49.4		49.2	32.2		53.7
Level of Service		E	C	C		C	D		D	C		D
Approach Delay (s)			33.4	30.1					41.0			53.7
Approach LOS			C	C					D			D

Intersection Summary			
HCM 2000 Control Delay	35.1	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	14.0
Intersection Capacity Utilization	81.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
26: Highway 101 NB Ramps & Rowland Boulevard 06/13/2017

Movement	NER
Lane Configurations	
Traffic Volume (vph)	6
Future Volume (vph)	6
Ideal Flow (vphpl)	1900
Total Lost time (s)	
Lane Util. Factor	
Frpb, ped/bikes	
Flpb, ped/bikes	
Frt	
Flt Protected	
Satd. Flow (prot)	
Flt Permitted	
Satd. Flow (perm)	
Peak-hour factor, PHF	0.95
Adj. Flow (vph)	6
RTOR Reduction (vph)	0
Lane Group Flow (vph)	0
Confl. Peds. (#/hr)	
Heavy Vehicles (%)	15%
Turn Type	
Protected Phases	
Permitted Phases	
Actuated Green, G (s)	
Effective Green, g (s)	
Actuated g/C Ratio	
Clearance Time (s)	
Vehicle Extension (s)	
Lane Grp Cap (vph)	
v/s Ratio Prot	
v/s Ratio Perm	
v/c Ratio	
Uniform Delay, d1	
Progression Factor	
Incremental Delay, d2	
Delay (s)	
Level of Service	
Approach Delay (s)	
Approach LOS	

Intersection Summary

Novato General Plan Update EIR W-Trans
PM Peak Hour Cumulative with Project Alt

HCM Signalized Intersection Capacity Analysis
27: Rowland Boulevard & Rowland Way

06/13/2017

Movement	EBU	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations							
Traffic Volume (vph)	6	236	1347	1441	27	38	356
Future Volume (vph)	6	236	1347	1441	27	38	356
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	4.0	4.0		3.2	3.2
Lane Util. Factor		0.97	0.91	0.95		1.00	0.95
Frpb, ped/bikes		1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes		1.00	1.00	1.00		1.00	1.00
Frt		1.00	1.00	1.00		0.88	0.85
Flt Protected		0.95	1.00	1.00		0.99	1.00
Satd. Flow (prot)		3468	5187	3594		1634	1519
Flt Permitted		0.95	1.00	1.00		0.99	1.00
Satd. Flow (perm)		3468	5187	3594		1634	1519
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	6	243	1389	1486	28	39	367
RTOR Reduction (vph)	0	0	0	1	0	147	180
Lane Group Flow (vph)	0	249	1389	1513	0	57	22
Confl. Peds. (#/hr)					12	2	
Heavy Vehicles (%)	0%	1%	0%	0%	7%	2%	1%
Turn Type	Prot	Prot	NA	NA		Prot	Perm
Protected Phases	5	5	2	6		4	
Permitted Phases							4
Actuated Green, G (s)		13.1	99.7	83.1		13.1	13.1
Effective Green, g (s)		13.1	99.7	83.1		13.1	13.1
Actuated g/C Ratio		0.11	0.83	0.69		0.11	0.11
Clearance Time (s)		3.5	4.0	4.0		3.2	3.2
Vehicle Extension (s)		2.0	4.0	4.0		2.0	2.0
Lane Grp Cap (vph)		378	4309	2488		178	165
v/s Ratio Prot		c0.07	0.27	c0.42		c0.03	
v/s Ratio Perm							0.01
v/c Ratio		0.66	0.32	0.61		0.32	0.13
Uniform Delay, d1		51.3	2.3	9.8		49.3	48.3
Progression Factor		1.02	1.17	1.00		1.00	1.00
Incremental Delay, d2		2.5	0.2	1.0		0.4	0.1
Delay (s)		54.6	2.9	10.8		49.7	48.5
Level of Service		D	A	B		D	D
Approach Delay (s)			10.8	10.8		49.1	
Approach LOS			B	B		D	

Intersection Summary				
HCM 2000 Control Delay	15.1	HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio	0.58			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)		10.7
Intersection Capacity Utilization	73.7%	ICU Level of Service		D
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
28: Rowland Boulevard & Vintage Way

06/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	544	831	2	640	6	839	3	2	4	3	0
Future Volume (vph)	18	544	831	2	640	6	839	3	2	4	3	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0	4.0	3.0	4.0		3.6	3.6			3.2	
Lane Util. Factor	1.00	0.95	0.88	1.00	0.95		0.97	1.00			1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	0.99			1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00			1.00	
Frt	1.00	1.00	0.85	1.00	1.00		1.00	0.94			1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00			0.97	
Satd. Flow (prot)	1805	3539	2842	1805	3568		3502	1768			1847	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00			0.97	
Satd. Flow (perm)	1805	3539	2842	1805	3568		3502	1768			1847	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	19	573	875	2	674	6	883	3	2	4	3	0
RTOR Reduction (vph)	0	0	0	0	1	0	0	1	0	0	0	0
Lane Group Flow (vph)	19	573	875	2	679	0	883	4	0	0	7	0
Confl. Peds. (#/hr)			9	9		13			11			
Confl. Bikes (#/hr)			2			2						
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Prot	NA	pt+ov	Prot	NA		Split	NA		Split	NA	
Protected Phases	5	2	2 3	1	6		3	3		4	4	
Permitted Phases												
Actuated Green, G (s)	5.4	49.6	105.0	2.8	47.0		51.4	51.4			2.4	
Effective Green, g (s)	5.4	49.6	105.0	2.8	47.0		51.4	51.4			2.4	
Actuated g/C Ratio	0.05	0.41	0.88	0.02	0.39		0.43	0.43			0.02	
Clearance Time (s)	3.0	4.0		3.0	4.0		3.6	3.6			3.2	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		3.0	3.0			2.0	
Lane Grp Cap (vph)	81	1462	2486	42	1397		1500	757			36	
v/s Ratio Prot	0.01	0.16	c0.31	0.00	c0.19		c0.25	0.00			c0.00	
v/s Ratio Perm												
v/c Ratio	0.23	0.39	0.35	0.05	0.49		0.59	0.01			0.19	
Uniform Delay, d1	55.3	24.6	1.4	57.3	27.4		26.2	19.7			57.8	
Progression Factor	1.17	1.17	0.96	1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.5	0.8	0.4	0.2	1.2		1.7	0.0			1.0	
Delay (s)	65.5	29.7	1.7	57.5	28.6		27.9	19.7			58.8	
Level of Service	E	C	A	E	C		C	B			E	
Approach Delay (s)		13.5			28.7			27.9			58.8	
Approach LOS		B			C			C			E	

Intersection Summary				
HCM 2000 Control Delay	21.2	HCM 2000 Level of Service		C
HCM 2000 Volume to Capacity ratio	0.53			
Actuated Cycle Length (s)	120.0	Sum of lost time (s)		13.8
Intersection Capacity Utilization	60.6%	ICU Level of Service		B
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
29: Novato Blvd #3 & Sunset Parkway

06/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	210	19	35	32	12	38	46	298	54	36	332	228
Future Volume (vph)	210	19	35	32	12	38	46	298	54	36	332	228
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.5	4.0		3.5	3.5		3.5	4.9		3.5	4.6	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.98		1.00	0.98		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.90		1.00	0.89		1.00	0.98		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	1674		1805	1644		1805	1834		1805	1777	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1787	1674		1805	1644		1805	1834		1805	1777	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	221	20	37	34	13	40	48	314	57	38	349	240
RTOR Reduction (vph)	0	30	0	0	36	0	0	5	0	0	20	0
Lane Group Flow (vph)	221	27	0	34	17	0	48	366	0	38	569	0
Confl. Peds. (#/hr)			11			6			3			
Confl. Bikes (#/hr)						1						
Heavy Vehicles (%)	1%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	1%
Turn Type	Prot	NA		Prot	NA		Prot	NA		Prot	NA	
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases												
Actuated Green, G (s)	13.1	15.6		5.2	8.2		5.2	38.3		5.2	38.6	
Effective Green, g (s)	13.1	15.6		5.2	8.2		5.2	38.3		5.2	38.6	
Actuated g/C Ratio	0.16	0.19		0.06	0.10		0.06	0.48		0.06	0.48	
Clearance Time (s)	3.5	4.0		3.5	3.5		3.5	4.9		3.5	4.6	
Vehicle Extension (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	291	325		117	168		117	875		117	855	
v/s Ratio Prot	c0.12	c0.02		0.02	0.01		c0.03	0.20		0.02	c0.32	
v/s Ratio Perm												
v/c Ratio	0.76	0.08		0.29	0.10		0.41	0.42		0.32	0.67	
Uniform Delay, d1	32.0	26.4		35.7	32.7		36.0	13.7		35.8	15.9	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	9.7	0.0		0.5	0.1		0.9	1.5		0.6	4.1	
Delay (s)	41.7	26.5		36.2	32.8		36.9	15.1		36.4	20.0	
Level of Service	D	C		D	C		D	B		D	B	
Approach Delay (s)		38.6			34.1			17.6			21.0	
Approach LOS		D			C			B			C	

Intersection Summary				
HCM 2000 Control Delay	24.3	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.60			
Actuated Cycle Length (s)	80.2	Sum of lost time (s)	15.9	
Intersection Capacity Utilization	65.0%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM 2010 AWSC
30: Redwood Blvd & Novato Blvd #3

06/13/2017

Intersection	
Intersection Delay, s/veh	48.8
Intersection LOS	E

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations																
Traffic Vol, veh/h	0	46	274	73	0	74	370	114	0	115	14	141	0	88	11	48
Future Vol, veh/h	0	46	274	73	0	74	370	114	0	115	14	141	0	88	11	48
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Heavy Vehicles, %	2	1	2	1	2	1	2	1	2	1	1	1	2	1	1	1
Mvmt Flow	0	48	288	77	0	78	389	120	0	121	15	148	0	93	12	51
Number of Lanes	0	1	1	0	0	1	1	0	0	1	1	1	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	2	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	3	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	2	2	2
HCM Control Delay	33.7	84.5	15.5	14.9
HCM LOS	D	F	C	B

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	100%	0%	0%	100%	0%	100%	0%	100%	0%
Vol Thru, %	0%	100%	0%	0%	79%	0%	76%	0%	19%
Vol Right, %	0%	0%	100%	0%	21%	0%	24%	0%	81%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	115	14	141	46	347	74	484	88	59
LT Vol	115	0	0	46	0	74	0	88	0
Through Vol	0	14	0	0	274	0	370	0	11
RT Vol	0	0	141	0	73	0	114	0	48
Lane Flow Rate	121	15	148	48	365	78	509	93	62
Geometry Grp	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.309	0.035	0.328	0.115	0.8	0.181	1.09	0.248	0.147
Departure Headway (Hd)	9.564	9.045	8.318	8.866	8.219	8.365	7.703	10.047	8.926
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	378	398	435	407	442	432	474	359	404
Service Time	7.264	6.745	6.018	6.566	5.919	6.065	5.403	7.747	6.626
HCM Lane V/C Ratio	0.32	0.038	0.34	0.118	0.826	0.181	1.074	0.259	0.153
HCM Control Delay	16.5	12.1	15	12.7	36.5	12.9	95.4	16	13.2
HCM Lane LOS	C	B	B	B	E	B	F	C	B
HCM 95th-tile Q	1.3	0.1	1.4	0.4	7.2	0.7	16.7	1	0.5

HCM Signalized Intersection Capacity Analysis
30: Redwood Blvd & Novato Blvd #3

06/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	46	274	73	74	370	114	115	14	141	88	11	48
Future Volume (vph)	46	274	73	74	370	114	115	14	141	88	11	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	16	12	16	16	12	12	12	12	12	12
Total Lost time (s)	3.5	4.0		3.5	4.0		3.5	4.0	4.0	3.5	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	0.96		1.00	1.00	0.85	1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1787	2049		1787	2041		1787	1881	1599	1787	1653	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1787	2049		1787	2041		1787	1881	1599	1787	1653	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	48	288	77	78	389	120	121	15	148	93	12	51
RTOR Reduction (vph)	0	9	0	0	11	0	0	0	125	0	46	0
Lane Group Flow (vph)	48	356	0	78	498	0	121	15	23	93	17	0
Heavy Vehicles (%)	1%	2%	1%	1%	2%	1%	1%	1%	1%	1%	1%	1%
Turn Type	Prot	NA		Prot	NA		Prot	NA	Perm	Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases									2			
Actuated Green, G (s)	2.6	20.0		4.2	21.6		9.6	8.4	8.4	6.4	5.2	
Effective Green, g (s)	2.6	20.0		4.2	21.6		9.6	8.4	8.4	6.4	5.2	
Actuated g/C Ratio	0.05	0.37		0.08	0.40		0.18	0.16	0.16	0.12	0.10	
Clearance Time (s)	3.5	4.0		3.5	4.0		3.5	4.0	4.0	3.5	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	86	758		138	816		317	292	248	211	159	
v/s Ratio Prot	0.03	0.17		c0.04	c0.24		c0.07	0.01		0.05	0.01	
v/s Ratio Perm									c0.01			
v/c Ratio	0.56	0.47		0.57	0.61		0.38	0.05	0.09	0.44	0.11	
Uniform Delay, d1	25.1	13.0		24.0	12.9		19.6	19.4	19.5	22.1	22.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	7.6	0.5		5.2	1.3		0.8	0.1	0.2	1.5	0.3	
Delay (s)	32.8	13.4		29.2	14.2		20.4	19.5	19.7	23.6	22.6	
Level of Service	C	B		C	B		C	B	B	C	C	
Approach Delay (s)		15.7			16.2			20.0			23.2	
Approach LOS		B			B			B			C	

Intersection Summary				
HCM 2000 Control Delay	17.5	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.48			
Actuated Cycle Length (s)	54.0	Sum of lost time (s)	15.0	
Intersection Capacity Utilization	52.8%	ICU Level of Service	A	
Analysis Period (min)	15			

c Critical Lane Group

MOVEMENT SUMMARY

Site: 30 [PM Cumulative Alt]

Novato Boulevard/Redwood Boulevard
PM Cumulative with Project Alternative

Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: NB Redwood Boulevard											
3	L2	121	2.0	0.328	7.8	LOS A	1.6	40.4	0.59	0.54	32.4
8	T1	15	2.0	0.328	7.8	LOS A	1.6	40.4	0.59	0.54	32.4
18	R2	148	2.0	0.328	7.8	LOS A	1.6	40.4	0.59	0.54	31.6
Approach		284	2.0	0.328	7.8	LOS A	1.6	40.4	0.59	0.54	32.0
East: WB Novato Blvd											
1	L2	78	2.0	0.526	9.4	LOS A	3.7	93.0	0.54	0.38	32.4
6	T1	389	2.0	0.526	9.4	LOS A	3.7	93.0	0.54	0.38	32.4
16	R2	120	2.0	0.526	9.4	LOS A	3.7	93.0	0.54	0.38	31.6
Approach		587	2.0	0.526	9.4	LOS A	3.7	93.0	0.54	0.38	32.2
North: SB Redwood Boulevard											
7	L2	93	2.0	0.211	7.3	LOS A	0.9	22.6	0.61	0.59	32.3
4	T1	12	2.0	0.211	7.3	LOS A	0.9	22.6	0.61	0.59	32.2
14	R2	51	2.0	0.211	7.3	LOS A	0.9	22.6	0.61	0.59	31.4
Approach		155	2.0	0.211	7.3	LOS A	0.9	22.6	0.61	0.59	32.0
West: EB Novato Blvd											
5	L2	48	2.0	0.287	5.7	LOS A	1.4	35.3	0.37	0.24	34.2
2	T1	288	2.0	0.287	5.7	LOS A	1.4	35.3	0.37	0.24	34.2
12	R2	77	2.0	0.065	3.6	LOS A	0.3	6.5	0.30	0.17	34.5
Approach		414	2.0	0.287	5.3	LOS A	1.4	35.3	0.35	0.23	34.2
All Vehicles		1440	2.0	0.526	7.7	LOS A	3.7	93.0	0.50	0.39	32.7

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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LANE SUMMARY

Site: 30 [PM Cumulative Alt]

Novato Boulevard/Redwood Boulevard
PM Cumulative with Project Alternative

Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: NB Redwood Boulevard													
Lane 1[d]	284	2.0	865	0.328	100	7.8	LOS A	1.6	40.4	Full	1600	0.0	0.0
Approach	284	2.0		0.328		7.8	LOS A	1.6	40.4				
East: WB Novato Blvd													
Lane 1[d]	587	2.0	1117	0.526	100	9.4	LOS A	3.7	93.0	Full	1600	0.0	0.0
Approach	587	2.0		0.526		9.4	LOS A	3.7	93.0				
North: SB Redwood Boulevard													
Lane 1[d]	155	2.0	734	0.211	100	7.3	LOS A	0.9	22.6	Full	1600	0.0	0.0
Approach	155	2.0		0.211		7.3	LOS A	0.9	22.6				
West: EB Novato Blvd													
Lane 1[d]	337	2.0	1176	0.287	100	5.7	LOS A	1.4	35.3	Full	1600	0.0	0.0
Lane 2	77	2.0	1176	0.065	100	3.6	LOS A	0.3	6.5	Short	30	0.0	NA
Approach	414	2.0		0.287		5.3	LOS A	1.4	35.3				
Intersection	1440	2.0		0.526		7.7	LOS A	3.7	93.0				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

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Project: N:\AAA\MAX\NOV\126NOV\SIDRA\Novato-Redwood.sip7

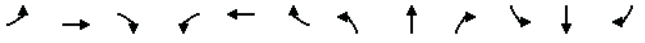
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	457	81	348	733	36	102	4	170	29	5	1
Future Volume (vph)	11	457	81	348	733	36	102	4	170	29	5	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.6	3.6	3.0	3.6			3.5	3.5		3.7	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00			1.00	0.98		1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00			0.99	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	0.99			1.00	0.85		1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00		0.96	
Satd. Flow (prot)	1770	3610	1573	1900	3585			1784	1589		1811	
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.76	1.00		0.75	
Satd. Flow (perm)	1770	3610	1573	1805	3585			1413	1589		1417	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	12	481	85	366	772	38	107	4	179	31	5	1
RTOR Reduction (vph)	0	0	31	0	2	0	0	0	152	0	1	0
Lane Group Flow (vph)	12	481	54	366	808	0	0	111	27	0	36	0
Confl. Peds. (#/hr)			4				7		4	4		7
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2				8		8	4		
Actuated Green, G (s)	1.2	47.4	47.4	27.4	73.6			15.1	15.1		14.9	
Effective Green, g (s)	1.2	47.4	47.4	27.4	73.6			15.1	15.1		14.9	
Actuated g/C Ratio	0.01	0.47	0.47	0.27	0.74			0.15	0.15		0.15	
Clearance Time (s)	3.0	3.6	3.6	3.0	3.6			3.5	3.5		3.7	
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0			2.0	2.0		2.0	
Lane Grp Cap (vph)	21	1711	745	520	2638			213	239		211	
v/s Ratio Prot	c0.01	0.13		c0.19	c0.23							
v/s Ratio Perm			0.03					c0.08	0.02		0.03	
v/c Ratio	0.57	0.28	0.07	0.70	0.31			0.52	0.11		0.17	
Uniform Delay, d1	49.1	16.0	14.3	32.7	4.5			39.1	36.7		37.2	
Progression Factor	1.00	1.00	1.00	0.76	0.80			1.00	1.00		1.00	
Incremental Delay, d2	21.2	0.4	0.2	3.2	0.3			1.1	0.1		0.1	
Delay (s)	70.4	16.4	14.5	28.1	3.9			40.2	36.7		37.3	
Level of Service	E	B	B	C	A			D	D		D	
Approach Delay (s)		17.2			11.4			38.1			37.3	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM 2000 Control Delay	17.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.46		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.3
Intersection Capacity Utilization	69.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
32: US 101 SB Off Ramp/Enfrente Rd & Ignacio Blvd/Ignacio Blvd #3

06/13/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	401	267	590	812	145	0	0	771	201	92	308
Future Volume (vph)	35	401	267	590	812	145	0	0	771	201	92	308
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	8.0	8.0	3.0	4.0				3.0		3.5	3.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95				0.88		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.96	1.00	0.99				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	1.00	0.85	1.00	0.98				0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00				1.00		0.97	1.00
Satd. Flow (prot)	1805	3610	1550	1787	3499				2842		1809	1578
Flt Permitted	0.95	1.00	1.00	0.95	1.00				1.00		0.97	1.00
Satd. Flow (perm)	1805	3610	1550	1787	3499				2842		1809	1578
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)	36	418	278	615	846	151	0	0	803	209	96	321
RTOR Reduction (vph)	0	0	203	0	11	0	0	0	390	0	0	241
Lane Group Flow (vph)	36	418	75	615	986	0	0	0	413	0	305	80
Confl. Peds. (#/hr)			7			20						1
Confl. Bikes (#/hr)						3						
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	5%	1%
Turn Type	Prot	NA	Perm	Prot	NA				Over	Split	NA	Perm
Protected Phases	5	2		1	6				1	7	7	
Permitted Phases			2									7
Actuated Green, G (s)	6.6	26.8	26.8	36.2	60.4				36.2		22.5	22.5
Effective Green, g (s)	6.6	26.8	26.8	36.2	60.4				36.2		22.5	22.5
Actuated g/C Ratio	0.07	0.27	0.27	0.36	0.60				0.36		0.22	0.22
Clearance Time (s)	3.0	8.0	8.0	3.0	4.0				3.0		3.5	3.5
Vehicle Extension (s)	2.0	2.5	2.5	3.0	4.0				3.0		2.5	2.5
Lane Grp Cap (vph)	119	967	415	646	2113				1028		407	355
v/s Ratio Prot	0.02	c0.12		c0.34	c0.28				0.15		c0.17	
v/s Ratio Perm			0.05									0.05
v/c Ratio	0.30	0.43	0.18	0.95	0.47				0.40		0.75	0.23
Uniform Delay, d1	44.5	30.3	28.1	31.1	10.9				23.8		36.1	31.6
Progression Factor	0.99	0.69	0.42	0.81	0.77				1.00		1.00	1.00
Incremental Delay, d2	0.5	1.4	0.9	16.6	0.4				0.3		7.0	0.2
Delay (s)	44.8	22.2	12.7	41.6	8.8				24.1		43.1	31.9
Level of Service	D	C	B	D	A				C		D	C
Approach Delay (s)		19.7			21.3			24.1			37.4	
Approach LOS		B			C			C			D	

Intersection Summary				
HCM 2000 Control Delay	24.3	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.76			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	14.5	
Intersection Capacity Utilization	79.6%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
33: Nave Dr & Ignacio Blvd #3/Bel Marin Keys Blvd #3

06/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	335	1044	118	681	574	870	769	257	0	0	0
Future Volume (vph)	0	335	1044	118	681	574	870	769	257	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.6	3.0	4.0		4.6	4.6	3.0			
Lane Util. Factor		0.95	1.00	1.00	0.95		0.91	0.91	1.00			
Frpb, ped/bikes		1.00	0.99	1.00	0.99		1.00	1.00	0.99			
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00			
Frt		1.00	0.85	1.00	0.93		1.00	1.00	0.85			
Flt Protected		1.00	1.00	0.95	1.00		0.95	0.98	1.00			
Satd. Flow (prot)		3610	1605	1805	3312		1643	3382	1600			
Flt Permitted		1.00	1.00	0.95	1.00		0.95	0.98	1.00			
Satd. Flow (perm)		3610	1605	1805	3312		1643	3382	1600			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	353	1099	124	717	604	916	809	271	0	0	0
RTOR Reduction (vph)	0	0	83	0	39	0	0	0	127	0	0	0
Lane Group Flow (vph)	0	353	1016	124	1282	0	559	1166	144	0	0	0
Confl. Peds. (#/hr)			1			1			1			
Heavy Vehicles (%)	0%	0%	0%	0%	0%	2%	0%	1%	0%	0%	0%	0%
Turn Type		NA	pm+ov	Prot	NA		Split	NA	pm+ov			
Protected Phases		2	3	1	6		3	3	1			
Permitted Phases			2						3			
Actuated Green, G (s)		35.6	75.8	12.6	51.2		40.2	40.2	52.8			
Effective Green, g (s)		35.6	75.8	12.6	51.2		40.2	40.2	52.8			
Actuated g/C Ratio		0.36	0.76	0.13	0.51		0.40	0.40	0.53			
Clearance Time (s)		4.0	4.6	3.0	4.0		4.6	4.6	3.0			
Vehicle Extension (s)		4.0	2.0	2.0	4.0		2.0	2.0	2.0			
Lane Grp Cap (vph)		1285	1216	227	1695		660	1359	844			
v/s Ratio Prot		0.10	c0.34	0.07	c0.39		0.34	c0.34	0.02			
v/s Ratio Perm			0.30						0.07			
v/c Ratio		0.27	0.84	0.55	0.76		0.85	0.86	0.17			
Uniform Delay, d1		23.0	8.0	41.0	19.4		27.1	27.3	12.2			
Progression Factor		1.09	1.09	1.00	1.00		1.00	1.00	1.00			
Incremental Delay, d2		0.5	4.3	1.4	3.2		9.5	5.4	0.0			
Delay (s)		25.5	13.0	42.5	22.6		36.6	32.7	12.3			
Level of Service		C	B	D	C		D	C	B			
Approach Delay (s)		16.0			24.3			31.0			0.0	
Approach LOS		B			C			C			A	

Intersection Summary				
HCM 2000 Control Delay	24.6	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.84			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.6	
Intersection Capacity Utilization	81.9%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
34: Bel Marin Keys Blvd #3 & Commercial Blvd 06/13/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	0	40	292	1	29	48	499	82	33	1140	7
Future Volume (vph)	3	0	40	292	1	29	48	499	82	33	1140	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	3.0	3.9		3.0	3.5	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			1.00	0.99	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.87			1.00	0.85	1.00	0.98		1.00	1.00	
Flt Protected		1.00			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1631			1807	1396	1805	3521		1805	3571	
Flt Permitted		0.98			0.69	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1608			1313	1396	1805	3521		1805	3571	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	3	0	44	324	1	32	53	554	91	37	1267	8
RTOR Reduction (vph)	0	33	0	0	0	22	0	14	0	0	0	0
Lane Group Flow (vph)	0	14	0	0	325	10	53	631	0	37	1275	0
Confl. Peds. (#/hr)	3		2	2		3			3			
Heavy Vehicles (%)	2%	0%	0%	0%	0%	14%	0%	0%	0%	0%	1%	0%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		22.8			22.8	22.8	4.0	37.7		3.6	37.7	
Effective Green, g (s)		22.8			22.8	22.8	4.0	37.7		3.6	37.7	
Actuated g/C Ratio		0.30			0.30	0.30	0.05	0.50		0.05	0.50	
Clearance Time (s)		4.0			4.0	4.0	3.0	3.9		3.0	3.5	
Vehicle Extension (s)		3.0			3.0	3.0	2.5	3.0		2.5	4.0	
Lane Grp Cap (vph)		488			399	424	96	1769		86	1795	
v/s Ratio Prot							c0.03	0.18		0.02	c0.36	
v/s Ratio Perm		0.01			c0.25	0.01						
v/c Ratio		0.03			0.81	0.02	0.55	0.36		0.43	0.71	
Uniform Delay, d1		18.3			24.1	18.3	34.6	11.3		34.7	14.4	
Progression Factor		1.00			1.00	1.00	1.00	1.00		0.89	0.76	
Incremental Delay, d2		0.0			12.1	0.0	5.4	0.6		2.0	1.9	
Delay (s)		18.4			36.2	18.3	40.0	11.9		33.0	12.8	
Level of Service		B			D	B	D	B		C	B	
Approach Delay (s)		18.4			34.6			14.0			13.4	
Approach LOS		B			C			B			B	

Intersection Summary				
HCM 2000 Control Delay	16.8	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.74			
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	10.9	
Intersection Capacity Utilization	69.5%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
35: Bel Marin Keys Blvd #3 & Hamilton Dr/Digital Dr 06/13/2017

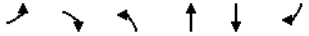
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	7	162	506	4	14	47	367	107	6	548	2
Future Volume (vph)	5	7	162	506	4	14	47	367	107	6	548	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	3.5	3.5	3.5		3.0	4.0		3.0	4.0	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.99	1.00	0.99		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	0.85	1.00	0.88		1.00	0.97		1.00	1.00	
Flt Protected		0.98	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1864	1533	1804	1658		1770	3470		1805	3572	
Flt Permitted		0.96	1.00	0.75	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1822	1533	1422	1658		1770	3470		1805	3572	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	8	176	550	4	15	51	399	116	7	596	2
RTOR Reduction (vph)	0	0	106	0	9	0	0	30	0	0	0	0
Lane Group Flow (vph)	0	13	70	550	10	0	51	485	0	7	598	0
Confl. Peds. (#/hr)	1		1	1		1			2			8
Heavy Vehicles (%)	0%	0%	4%	0%	0%	0%	2%	0%	0%	0%	1%	0%
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8								
Actuated Green, G (s)		30.0	30.0	30.0	30.0		5.4	32.7		1.8	29.1	
Effective Green, g (s)		30.0	30.0	30.0	30.0		5.4	32.7		1.8	29.1	
Actuated g/C Ratio		0.40	0.40	0.40	0.40		0.07	0.44		0.02	0.39	
Clearance Time (s)		3.5	3.5	3.5	3.5		3.0	4.0		3.0	4.0	
Vehicle Extension (s)		2.0	2.0	2.5	2.5		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)		728	613	568	663		127	1512		43	1385	
v/s Ratio Prot					0.01		c0.03	0.14		0.00	c0.17	
v/s Ratio Perm		0.01	0.05	c0.39								
v/c Ratio		0.02	0.11	0.97	0.02		0.40	0.32		0.16	0.43	
Uniform Delay, d1		13.6	14.2	22.0	13.6		33.3	13.9		35.9	16.9	
Progression Factor		1.00	1.00	1.00	1.00		1.38	0.49		1.00	1.00	
Incremental Delay, d2		0.0	0.0	29.5	0.0		0.7	0.5		0.7	1.0	
Delay (s)		13.6	14.2	51.6	13.6		46.8	7.3		36.5	17.9	
Level of Service		B	B	D	B		D	A		D	B	
Approach Delay (s)		14.1			50.3			10.9			18.1	
Approach LOS		B			D			B			B	

Intersection Summary				
HCM 2000 Control Delay	25.1	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.68			
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	10.5	
Intersection Capacity Utilization	73.0%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
36: Nave Dr & US 101 NB Off Ramp

06/13/2017



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	714	233	0	1194	906	246
Future Volume (vph)	714	233	0	1194	906	246
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		5.0	5.0	
Lane Util. Factor	0.97	1.00		0.95	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	0.97	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3467	1563		3574	3467	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3467	1563		3574	3467	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	729	238	0	1218	924	251
RTOR Reduction (vph)	0	37	0	0	35	0
Lane Group Flow (vph)	729	201	0	1218	1140	0
Confl. Peds. (#/hr)		1				
Heavy Vehicles (%)	1%	2%	0%	1%	1%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	31.0	31.0		31.0	31.0	
Effective Green, g (s)	31.0	31.0		31.0	31.0	
Actuated g/C Ratio	0.44	0.44		0.44	0.44	
Clearance Time (s)	3.0	3.0		5.0	5.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	1535	692		1582	1535	
v/s Ratio Prot	c0.21			c0.34	0.33	
v/s Ratio Perm		0.13				
v/c Ratio	0.47	0.29		0.77	0.74	
Uniform Delay, d1	13.8	12.5		16.5	16.2	
Progression Factor	1.00	1.00		0.51	1.00	
Incremental Delay, d2	1.1	1.1		2.6	3.3	
Delay (s)	14.8	13.5		11.0	19.5	
Level of Service	B	B		B	B	
Approach Delay (s)	14.5			11.0	19.5	
Approach LOS	B			B	B	

Intersection Summary				
HCM 2000 Control Delay	15.0	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.62			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	63.0%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
37: Nave Dr & Hamilton Center

06/13/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	120	45	918	133	147	797
Future Volume (vph)	120	45	918	133	147	797
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.2	3.2	4.4		3.0	4.4
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.98		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1805	1615	1862		1770	1881
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1805	1615	1862		1770	1881
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	125	47	956	139	153	830
RTOR Reduction (vph)	0	43	6	0	0	0
Lane Group Flow (vph)	125	4	1089	0	153	830
Confl. Peds. (#/hr)				2		
Heavy Vehicles (%)	0%	0%	0%	0%	2%	1%
Turn Type	Prot	Perm	NA		Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8				
Actuated Green, G (s)	6.5	6.5	44.8		8.1	55.9
Effective Green, g (s)	6.5	6.5	44.8		8.1	55.9
Actuated g/C Ratio	0.09	0.09	0.64		0.12	0.80
Clearance Time (s)	3.2	3.2	4.4		3.0	4.4
Vehicle Extension (s)	1.0	1.0	1.0		1.0	1.0
Lane Grp Cap (vph)	167	149	1191		204	1502
v/s Ratio Prot	c0.07		c0.58		c0.09	0.44
v/s Ratio Perm		0.00				
v/c Ratio	0.75	0.03	0.91		0.75	0.55
Uniform Delay, d1	31.0	28.9	10.9		30.0	2.5
Progression Factor	1.00	1.00	0.84		1.08	0.90
Incremental Delay, d2	14.8	0.0	10.4		9.8	1.1
Delay (s)	45.7	28.9	19.6		42.1	3.4
Level of Service	D	C	B		D	A
Approach Delay (s)	41.1		19.6			9.4
Approach LOS	D		B			A

Intersection Summary				
HCM 2000 Control Delay	16.8	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.87			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	10.6	
Intersection Capacity Utilization	81.5%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
38: Nave Dr & Hamilton Pkwy

06/13/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	92	392	534	55	333	443
Future Volume (vph)	92	392	534	55	333	443
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.2	3.2	4.4	4.4	3.0	4.4
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	0.98	1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1599	1900	1578	1787	1850
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	1599	1900	1578	1787	1900
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	97	413	562	58	351	466
RTOR Reduction (vph)	0	359	0	15	0	0
Lane Group Flow (vph)	97	54	562	43	351	466
Confl. Peds. (#/hr)				2		
Heavy Vehicles (%)	2%	1%	0%	0%	1%	0%
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Actuated Green, G (s)	9.2	9.2	27.3	27.3	22.9	53.2
Effective Green, g (s)	9.2	9.2	27.3	27.3	22.9	53.2
Actuated g/C Ratio	0.13	0.13	0.39	0.39	0.33	0.76
Clearance Time (s)	3.2	3.2	4.4	4.4	3.0	4.4
Vehicle Extension (s)	2.0	2.0	3.0	3.0	2.0	3.0
Lane Grp Cap (vph)	232	210	741	615	584	1406
v/s Ratio Prot	c0.05		c0.30		c0.20	0.25
v/s Ratio Perm		0.03		0.03		
v/c Ratio	0.42	0.26	0.76	0.07	0.60	0.33
Uniform Delay, d1	27.9	27.3	18.5	13.4	19.7	2.7
Progression Factor	1.00	1.00	1.00	1.00	0.99	0.23
Incremental Delay, d2	0.4	0.2	7.2	0.2	1.0	0.5
Delay (s)	28.4	27.6	25.6	13.6	20.6	1.2
Level of Service	C	C	C	B	C	A
Approach Delay (s)	27.7		24.5			9.5
Approach LOS	C		C			A

Intersection Summary				
HCM 2000 Control Delay	19.1	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.64			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	10.6	
Intersection Capacity Utilization	62.0%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
39: Nave Dr & Main Gate Dr

06/13/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	354	282	293	319	279	271
Future Volume (vph)	354	282	293	319	279	271
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	4.1	4.1	3.0	4.4
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1805	1615	1900	1615	1805	1881
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1805	1615	1900	1615	1805	1881
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	373	297	308	336	294	285
RTOR Reduction (vph)	0	210	0	248	0	0
Lane Group Flow (vph)	373	87	308	88	294	285
Heavy Vehicles (%)	0%	0%	0%	0%	0%	1%
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Actuated Green, G (s)	14.7	14.7	13.2	13.2	12.4	28.3
Effective Green, g (s)	14.7	14.7	13.2	13.2	12.4	28.3
Actuated g/C Ratio	0.29	0.29	0.26	0.26	0.25	0.56
Clearance Time (s)	3.0	3.0	4.1	4.1	3.0	4.4
Vehicle Extension (s)	2.0	2.0	1.0	1.0	1.0	1.0
Lane Grp Cap (vph)	526	471	497	422	444	1056
v/s Ratio Prot	c0.21		c0.16		c0.16	0.15
v/s Ratio Perm		0.05		0.05		
v/c Ratio	0.71	0.18	0.62	0.21	0.66	0.27
Uniform Delay, d1	15.9	13.4	16.4	14.5	17.1	5.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.6	0.1	1.6	0.1	2.9	0.1
Delay (s)	19.5	13.4	18.0	14.6	20.0	5.8
Level of Service	B	B	B	B	B	A
Approach Delay (s)	16.8		16.2			13.0
Approach LOS	B		B			B

Intersection Summary				
HCM 2000 Control Delay	15.4	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.66			
Actuated Cycle Length (s)	50.4	Sum of lost time (s)	10.1	
Intersection Capacity Utilization	60.6%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
40: Nave Dr & Bolling Dr

06/13/2017

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	220	63	562	346	98	572
Future Volume (vph)	220	63	562	346	98	572
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0	4.1		3.0	3.5
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	0.97	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	0.85	0.95		1.00	1.00
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1787	1569	1791		1805	1881
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1787	1569	1791		1805	1881
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	229	66	585	360	102	596
RTOR Reduction (vph)	0	52	23	0	0	0
Lane Group Flow (vph)	229	14	922	0	102	596
Confl. Peds. (#/hr)		6				
Heavy Vehicles (%)	1%	0%	1%	0%	0%	1%
Turn Type	Prot	Perm	NA		Prot	NA
Protected Phases	4		6		5	2
Permitted Phases		4				
Actuated Green, G (s)	14.1	14.1	37.6		6.9	48.1
Effective Green, g (s)	14.1	14.1	37.6		6.9	48.1
Actuated g/C Ratio	0.21	0.21	0.55		0.10	0.70
Clearance Time (s)	3.0	3.0	4.1		3.0	3.5
Vehicle Extension (s)	2.0	2.0	2.0		2.0	2.0
Lane Grp Cap (vph)	366	322	980		181	1316
v/s Ratio Prot	c0.13		c0.51		c0.06	0.32
v/s Ratio Perm		0.01				
v/c Ratio	0.63	0.04	0.94		0.56	0.45
Uniform Delay, d1	24.9	21.9	14.5		29.5	4.5
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	2.4	0.0	16.2		2.4	0.1
Delay (s)	27.3	21.9	30.7		31.8	4.6
Level of Service	C	C	C		C	A
Approach Delay (s)	26.1		30.7			8.6
Approach LOS	C		C			A

Intersection Summary				
HCM 2000 Control Delay	22.0	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.82			
Actuated Cycle Length (s)	68.7	Sum of lost time (s)	10.1	
Intersection Capacity Utilization	81.9%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

HCM 2010 AWSC
41: Alameda Del Prado & Clay Ct/Nave Dr

06/13/2017

Intersection	
Intersection Delay, s/veh	19.6
Intersection LOS	C

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations																
Traffic Vol, veh/h	0	8	11	1	0	107	21	756	0	0	70	39	0	273	71	13
Future Vol, veh/h	0	8	11	1	0	107	21	756	0	0	70	39	0	273	71	13
Peak Hour Factor	0.95	0.97	0.97	0.97	0.95	0.97	0.97	0.97	0.95	0.97	0.97	0.97	0.95	0.97	0.97	0.97
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	8	11	1	0	110	22	779	0	0	72	40	0	281	73	13
Number of Lanes	0	0	1	0	0	0	1	1	0	0	1	0	0	1	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	2	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	2	1	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	2	2	1
HCM Control Delay	10.8	21.5	12	17.9
HCM LOS	B	C	B	C

Lane	NBLn1	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2
Vol Left, %	0%	40%	24%	0%	100%	0%
Vol Thru, %	64%	55%	5%	0%	0%	85%
Vol Right, %	36%	5%	71%	100%	0%	15%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	109	20	446	438	273	84
LT Vol	0	8	107	0	273	0
Through Vol	70	11	21	0	0	71
RT Vol	39	1	318	438	0	13
Lane Flow Rate	112	21	459	452	281	87
Geometry Grp	6	6	7	7	7	7
Degree of Util (X)	0.218	0.042	0.741	0.689	0.582	0.164
Departure Headway (Hd)	6.974	7.371	5.809	5.484	7.445	6.827
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	515	484	620	655	484	525
Service Time	5.025	5.449	3.559	3.234	5.194	4.575
HCM Lane V/C Ratio	0.217	0.043	0.74	0.69	0.581	0.166
HCM Control Delay	12	10.8	23.4	19.6	20.1	10.9
HCM Lane LOS	B	B	C	C	C	B
HCM 95th-tile Q	0.8	0.1	6.5	5.5	3.6	0.6

Project Alternative Roadway Segment Level of Service Calculations

Arterial Level of Service: EB Novato Blvd #1

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
San Marin Dr	9	14.6	27.5	0.1	17
Eucalyptus	135	11.3	45.5	0.4	33
Total		25.9	73.1	0.5	27

Arterial Level of Service: WB Novato Blvd #1

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Sutro Ave	9	24.5	59.5	0.4	25
	134	3.7	16.3	0.1	28
Total		28.1	75.8	0.5	26

Arterial Level of Service: EB Novato Blvd #2

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	138	4.2	46.3	0.4	33
Raposa Vista	137	12.0	27.3	0.2	22
Wilson Ave	10	16.2	28.6	0.1	17
Simmons Ln	11	5.7	12.3	0.1	19
Grant Ave	12	13.2	52.9	0.4	28
Tamalpais Ave	13	27.0	56.9	0.3	18
Diablo Ave	14	59.6	97.6	0.4	14
Total		137.9	321.8	1.9	21

Arterial Level of Service: WB Novato Blvd #2

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
7th St	13	24.4	59.8	0.4	23
Grant Ave	12	7.0	38.9	0.3	26
Simmons Ln	11	18.0	55.1	0.4	27
Wilson Ave	10	6.6	13.2	0.1	18
Raposa Vista	137	13.9	27.2	0.1	18
	138	4.2	21.5	0.2	28
Eucalyptus	135	10.7	49.0	0.4	31
Total		84.9	264.7	1.9	25

Arterial Level of Service
PM Peak Hour Existing plus Project Alternative 01/23/2018

Arterial Level of Service: NB Novato Blvd #3

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Redwood Blvd	30	14.6	30.7	0.2	19
	92	5.0	72.5	0.5	26
Sunset Parkway	29	11.5	39.6	0.3	30
Rowland Boulevard	23	63.4	85.2	0.3	11
Arthur Street	22	10.8	38.6	0.3	31
Garden Ct	21	8.3	47.0	0.4	34
Diablo Ave	14	78.2	111.0	0.4	12
Total		191.9	424.7	2.4	21

Arterial Level of Service: SB Novato Blvd #3

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Center Rd	21	14.0	47.3	0.4	28
Arthur Street	22	11.0	45.4	0.4	35
	23	13.1	45.3	0.3	26
Sunset Parkway	29	15.6	39.1	0.3	24
	92	3.4	35.7	0.3	33
Redwood Blvd	30	13.5	62.7	0.5	30
Total		70.5	275.5	2.3	30

Arterial Level of Service: NB #3

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Nave Dr	33	25.3	35.4	0.1	13
Commercial Blvd	34	11.3	24.8	0.1	21
Digital Dr	35	8.1	19.4	0.1	24
Total		44.7	79.7	0.4	18

Arterial Level of Service: WB #3

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Hamilton Dr	35	13.7	25.2	0.1	20
Commercial Blvd	34	8.2	19.1	0.1	25
US 101 NB On Ramp	33	17.9	29.5	0.1	18
Enfrente Rd	32	15.4	28.1	0.1	16
Total		55.1	101.9	0.5	19

Novato General Plan Update EIR SimTraffic Report
W-Trans

Arterial Level of Service: EB Novato Blvd #2

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	138	4.1	45.5	0.4	34
Raposa Vista	137	11.6	26.6	0.2	23
Wilson Ave	10	16.9	29.0	0.1	17
Simmons Ln	11	6.1	12.8	0.1	18
Grant Ave	12	11.7	51.7	0.4	29
Tamalpais Ave	13	25.5	55.6	0.3	18
	45	5.2	41.2	0.3	27
Diablo Ave	14	19.8	27.1	0.1	8
Center Rd	21	13.4	46.6	0.4	28
Total		114.4	335.9	2.2	24

Arterial Level of Service: WB Novato Blvd #2

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Diablo Ave	14	38.2	67.6	0.4	19
	45	5.2	13.5	0.1	17
7th St	13	16.9	52.6	0.3	21
Grant Ave	12	7.1	39.4	0.3	26
Simmons Ln	11	17.6	54.8	0.4	27
Wilson Ave	10	7.1	13.7	0.1	17
Raposa Vista	137	14.0	27.3	0.1	18
	138	4.2	21.3	0.2	28
Eucalyptus	135	11.3	49.2	0.4	31
Total		121.7	339.4	2.2	24

Arterial Level of Service: NB Novato Blvd #3

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Redwood Blvd	30	14.3	30.3	0.2	19
	92	5.8	75.4	0.5	25
Sunset Parkway	29	13.5	41.8	0.3	28
Rowland Boulevard	23	55.9	76.8	0.3	12
Arthur Street	22	8.4	39.2	0.3	30
Garden Ct	21	6.7	44.6	0.4	36
Diablo Ave	14	38.2	67.6	0.4	19
Total		142.9	375.6	2.4	23

Arterial Level of Service
PM Peak Hour Existing + Project Alternative MITIGATED 02/12/2018

Arterial Level of Service: SB Novato Blvd #3

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Center Rd	21	13.4	46.6	0.4	28
Arthur Street	22	11.7	52.6	0.4	30
	23	14.0	45.2	0.3	26
Sunset Parkway	29	17.0	40.8	0.3	23
	92	3.5	35.8	0.3	33
Redwood Blvd	30	17.1	66.5	0.5	28
Total		76.7	287.4	2.3	28

Novato General Plan Update EIR SimTraffic Report
W-Trans

Arterial Level of Service: EB Novato Blvd #1

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
San Marin Dr	9	13.6	26.5	0.1	17
Eucalyptus	136	11.0	45.4	0.4	33
Total		24.6	71.9	0.5	27

Arterial Level of Service: WB Novato Blvd #1

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Sutro Ave	9	34.7	70.3	0.4	21
	135	3.8	16.6	0.1	28
Total		38.5	87.0	0.5	22

Arterial Level of Service: EB Novato Blvd #2

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	139	4.1	45.9	0.4	33
Raposa Vista	138	12.2	27.5	0.2	22
Wilson Ave	10	15.9	28.3	0.1	17
Simmons Ln	11	5.9	12.5	0.1	19
Grant Ave	12	11.8	52.0	0.4	28
Tamalpais Ave	13	27.8	58.0	0.3	17
Diablo Ave	14	72.0	111.2	0.4	12
Total		149.7	335.3	1.9	20

Arterial Level of Service: WB Novato Blvd #2

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
7th St	13	29.4	66.0	0.4	21
Grant Ave	12	6.5	38.7	0.3	26
Simmons Ln	11	17.8	54.8	0.4	27
Wilson Ave	10	6.7	13.3	0.1	18
Raposa Vista	138	14.3	27.4	0.1	18
	139	4.2	21.4	0.2	28
Eucalyptus	136	11.4	49.7	0.4	31
Total		90.3	271.3	1.9	25

Arterial Level of Service: NB Novato Blvd #3

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Redwood Blvd	30	14.5	30.6	0.2	19
	114	4.8	72.6	0.5	26
Sunset Parkway	29	10.9	39.0	0.3	30
Rowland Boulevard	23	65.1	86.4	0.3	11
Arthur Street	22	9.9	40.7	0.3	29
Garden Ct	21	7.6	46.3	0.4	35
Diablo Ave	14	80.4	112.7	0.4	12
Total		193.4	428.3	2.4	20

Arterial Level of Service: SB Novato Blvd #3

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Center Rd	21	11.1	45.3	0.4	29
Arthur Street	22	11.8	51.3	0.4	31
	23	12.2	44.1	0.3	27
Sunset Parkway	29	15.9	39.7	0.3	24
	114	3.5	35.5	0.3	33
Redwood Blvd	30	14.0	64.5	0.5	29
Total		68.5	280.4	2.3	29

Arterial Level of Service: NB #3

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Nave Dr	33	23.6	33.9	0.1	14
Commercial Blvd	34	11.8	25.2	0.1	21
Digital Dr	35	10.3	21.5	0.1	22
Total		45.7	80.6	0.4	18

Arterial Level of Service: WB #3

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Hamilton Dr	35	14.7	26.2	0.1	19
Commercial Blvd	34	9.1	19.7	0.1	24
US 101 NB On Ramp	33	20.0	31.6	0.1	17
Enfrente Rd	32	16.5	29.4	0.1	16
Total		60.2	106.9	0.5	18

Arterial Level of Service: EB Novato Blvd #2

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
	139	4.3	45.9	0.4	33
Raposa Vista	138	12.8	28.2	0.2	21
Wilson Ave	10	18.7	31.2	0.1	16
Simmons Ln	11	7.2	13.9	0.1	17
Grant Ave	12	12.6	52.6	0.4	28
Tamalpais Ave	13	28.5	58.2	0.3	17
	200	4.6	37.9	0.3	28
Diablo Ave	14	22.6	32.7	0.1	10
Center Rd	21	14.8	48.3	0.4	27
Total		126.1	349.0	2.2	23

Arterial Level of Service: WB Novato Blvd #2

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Diablo Ave	14	47.1	76.2	0.4	17
	200	6.8	17.6	0.1	18
7th St	13	22.6	55.3	0.3	19
Grant Ave	12	6.7	39.4	0.3	26
Simmons Ln	11	23.1	60.1	0.4	25
Wilson Ave	10	9.0	15.6	0.1	15
Raposa Vista	138	15.2	28.3	0.1	17
	139	4.3	21.5	0.2	28
Eucalyptus	136	13.1	51.4	0.4	30
Total		147.9	365.7	2.2	22

Arterial Level of Service: NB Novato Blvd #3

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Redwood Blvd	30	17.7	33.6	0.2	17
	114	5.9	73.8	0.5	26
Sunset Parkway	29	11.9	40.3	0.3	29
Rowland Boulevard	23	67.3	89.3	0.3	11
Arthur Street	22	10.6	41.0	0.3	29
Garden Ct	21	8.2	46.3	0.4	35
Diablo Ave	14	47.1	76.2	0.4	17
Total		168.6	400.5	2.4	22

Arterial Level of Service
PM Peak Hour Cumulative with Project Alt (Mitigated) 02/12/2018

Arterial Level of Service: SB Novato Blvd #3

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Center Rd	21	14.8	48.3	0.4	27
Arthur Street	22	12.9	52.3	0.4	31
	23	14.1	46.3	0.3	26
Sunset Parkway	29	16.7	40.3	0.3	24
	114	3.5	36.1	0.3	33
Redwood Blvd	30	19.0	68.7	0.5	28
Total		81.0	292.0	2.3	28

Project Alternative Freeway Level of Service Calculations

HCS7 Freeway Facilities Report

Project Information

Analyst	W-Trans	Agency	
Jurisdiction	City of Novato	Time Period Analyzed	AM Existing+Project Alt - Northbound
Analysis Year	2016	Date	6/8/17
Project Description	City of Novato General Plan Update EIR		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	24
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	Novato S City Limits->Alameda del Prado	2000	5
2	Diverge	Basic	Alameda del Prado Off->	1500	5
3	Basic	Basic	Alameda del Prado Off->Alameda del Prado On	2000	4
4	Merge	Merge	Alameda del Prado On->	1000	4
5	Basic	Basic	Alameda del Prado On->Nave Off	2600	4
6	Diverge	Diverge	Nave Off->	1000	4
7	Basic	Basic	Nave Off->Nave On	2000	4
8	Merge	Basic	Nave On->	500	5
9	Merge	Merge	Ignacio On->	1500	5
10	Diverge	Basic	SR37 Off->	1500	5
11	Diverge	Diverge	Novato Blvd Off->	1500	4
12	Basic	Basic	Novato Blvd Off->SR 37 On	2650	4
13	Weaving	Weaving	SR37->Rowland Blvd	2050	5
14	Basic	Basic	Rowland Blvd Off->Rowland Blvd On	2900	4
15	Merge	Merge	Rowland Blvd On->	1200	4
16	Diverge	Diverge	De Long Off->	1200	4
17	Basic	Basic	De Long Off->De Long On	2000	4
18	Merge	Merge	De Long Ave On->	1200	4
19	Diverge	Diverge	Atherton Ave Off->	1200	4
20	Basic	Basic	Atherton Ave Off->Atherton Ave On	900	4
21	Merge	Merge	Atherton Ave On->	1000	4
22	Basic	Basic	Atherton On -> End HOV	2300	3
23	Basic	Basic	End HOV	2000	2
24	Basic	Basic	End HOV -> Begin 2 lane fwy	2500	2

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	4981	12000	0.42	75.4	13.2	B

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	4981	371	12000	2000	0.42	0.19	75.4	-	13.2	-	B

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	4613	9600	0.48	75.1	15.4	B

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	4730	117	9600	2000	0.49	0.06	68.8	64.6	17.2	18.6	B

Segment 5: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	4729	9600	0.49	75.0	15.8	B

Segment 6: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	1.00	0.957	1.000	4729	869	9600	2000	0.49	0.43	67.5	58.5	17.5	24.4	C

Segment 7: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	3821	9600	0.40	75.4	12.7	B

Segment 8: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	4019	198	12000	2000	0.32	0.10	75.4	-	10.7	-	A

Segment 9: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	4772	754	12000	2000	0.40	0.38	69.0	64.2	11.3	19.6	B

Segment 10: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	4766	938	12000	4200	0.40	0.22	75.4	-	12.6	-	B

Segment 11: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	3835	183	9600	2000	0.40	0.09	70.7	60.6	13.6	19.5	B

Segment 12: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	3653	9600	0.38	75.4	12.1	B

Segment 13: Weaving

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	4301	6630	0.65	65.2	13.3	B

Segment 14: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	3341	9600	0.35	75.4	11.1	B

Segment 15: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	3750	409	9600	2000	0.39	0.20	70.0	66.3	13.4	12.7	B

Segment 16: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	3747	840	9600	2000	0.39	0.42	67.2	58.6	13.9	18.3	B

Segment 17: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	2913	9600	0.30	75.4	9.7	A

Segment 18: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	3098	185	9600	2000	0.32	0.09	70.6	66.5	11.0	9.7	A

Segment 19: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	0.990	3097	874	9600	2000	0.32	0.44	66.4	58.5	11.7	16.1	B

Segment 20: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	2238	9600	0.23	75.4	7.4	A

Segment 21: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	2727	489	9014	1878	0.30	0.26	66.3	64.3	10.3	10.8	B

Segment 22: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	1.000	2773	7200	0.39	71.7	12.9	B

Segment 23: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	2724	4472	0.61	67.3	20.2	C

Segment 24: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	2724	3628	0.75	51.0	26.7	D

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	70.9	13.4	12.9	6.4	B

Facility Overall Results

Space Mean Speed, mi/h	70.9	Density, veh/mi/ln	12.9
Average Travel Time, min	6.4		

HCS7 Freeway Facilities Report

Project Information

Analyst	W-Trans	Agency	
Jurisdiction	City of Novato	Time Period Analyzed	AM Existing + Project Alt - Southbound
Analysis Year	2016	Date	6/8/17
Project Description	City of Novato General Plan EIR		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	24
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	N Novato City Limits->San Marin Dr	3200	3
2	Diverge	Diverge	San Marin Dr Off->	1500	3
3	Basic	Basic	San Marin Dr Off->San Marin Dr On	2100	3
4	Merge	Merge	San Marin Dr On->	1175	3
5	Diverge	Diverge	De Long Ave Off->	1175	3
6	Basic	Basic	De Long Ave Off->De Long Ave On	1975	3
7	Merge	Merge	De Long Ave On->	1170	3
8	Diverge	Diverge	BEGIN HOV	200	3
9	Diverge	Diverge	Rowland Blvd Off->	1170	3
10	Basic	Basic	Rowland Blvd Off->Rowland Blvd On	3150	3
11	Merge	Merge	Rowland Blvd On->	1200	3
12	Basic	Basic	Rowland Blvd->SR37-Novato Blvd	770	3
13	Diverge	Diverge	SR37-Novato Blvd Off->	1200	3
14	Basic	Basic	SR37-Novato Blvd Off->SR37-Novato Blvd On	3400	3
15	Merge	Basic	SR37-Novato Blvd On->	1030	4
16	Diverge	Diverge	Ignacio-Enfrente Off->	1000	4
17	Diverge	Basic	BMK-Nave Off->	800	4
18	Basic	Basic	Ignacio Blvd Off->Ignacio Blvd On	1425	3
19	Merge	Merge	Ignacio Blvd On->	1500	3
20	Basic	Basic	Ignacio Blvd->Alameda Del Prado	2250	3
21	Diverge	Diverge	ADP Off->	1500	3
22	Basic	Basic	ADP Off->ADP On	1200	3
23	Merge	Basic	ADP On->	1500	3
24	Basic	Basic	Alameda Del Prado->S Novato City Limits	1000	4

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.957	6887	7200	0.96	56.5	40.7	E

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.957	0.980	6875	723	7200	2000	0.96	0.36	66.2	61.1	34.6	38.8	E

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.954	5946	7200	0.86	64.4	30.8	D

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.960	0.980	6556	676	7200	2100	0.95	0.32	43.6	56.1	50.2	36.7	F

Segment 5: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.960	0.980	6479	339	7200	2000	0.95	0.17	41.5	62.2	52.0	37.9	F

Segment 6: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.958	5989	7200	0.90	31.0	64.5	F

Segment 7: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.963	0.980	6704	715	7200	2000	1.00	0.36	60.3	56.6	37.1	36.3	E

Segment 8: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	1.00	0.963	0.990	6704	1091	7200	2200	1.00	0.50	70.0	66.5	31.9	41.6	E

Segment 9: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	

1	0.98	0.95	0.963	0.980	5613	857	7200	2000	0.84	0.43	66.1	60.7	28.3	34.4	D

Segment 10: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98		0.960		4756		7200		0.72		71.4		22.2		C

Segment 11: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.966	0.980	5408	652	7200	2000	0.81	0.33	64.3	61.4	28.0	30.2	D

Segment 12: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98		0.966		5408		7200		0.81		68.0		26.5		D

Segment 13: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.966	0.962	5408	316	7200	2100	0.81	0.15	69.1	64.5	26.1	32.8	D

Segment 14: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98		0.967		5092		7200		0.76		69.8		24.3		C

Segment 15: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.966	0.962	7802	2819	9600	4000	0.57	0.70	59.3	-	32.9	-	D

Segment 16: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.966	0.980	7633	657	9600	2000	0.86	0.33	69.3	61.3	27.5	31.6	D

Segment 17: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.964	0.980	6815	1008	9600	2000	0.79	0.50	31.5	-	54.1	-	F

Segment 18: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS

1	0.98		0.962		5656		7200		0.92		27.6		68.4		F

Segment 19: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.965	0.980	6249	679	7200	2000	1.01	0.34	34.9	52.9	59.6	39.0	F

Segment 20: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98		0.965		6119		7200		1.01		32.5		62.7		F

Segment 21: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.932	0.980	6033	215	7200	2000	1.04	0.11	30.3	62.6	66.3	41.6	F

Segment 22: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98		0.931		5737		7200		1.01		26.1		73.3		F

Segment 23: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.934	0.980	6704	967	7200	2000	1.01	0.48	60.3	-	37.1	-	F

Segment 24: Basic

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98		0.934		6704		9600		0.86		70.1		23.9		C

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	46.9	41.1	39.3	8.9	F

Facility Overall Results

Space Mean Speed, mi/h	46.9	Density, veh/mi/ln	39.3
Average Travel Time, min	8.9		

HCS7 Freeway Facilities Report

Project Information

Analyst	W-Trans	Agency	
Jurisdiction	City of Novato	Time Period Analyzed	PM Existing + Project Alt - Northbound
Analysis Year	2016	Date	6/8/17
Project Description	City of Novato General Plan Update EIR		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	23
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	Novato S City Limits->Alameda del Prado	2000	4
2	Diverge	Basic	Alameda del Prado Off->	1500	4
3	Basic	Basic	Alameda del Prado Off->Alameda del Prado On	2000	3
4	Merge	Merge	Alameda del Prado On->	1000	3
5	Basic	Basic	Alameda del Prado On->Nave Off	2600	3
6	Diverge	Diverge	Nave Off->	1000	3
7	Basic	Basic	Nave Off->Nave On	2000	3
8	Merge	Basic	Nave On->	500	4
9	Merge	Merge	Ignacio On->	1500	4
10	Diverge	Basic	SR37 Off->	1500	4
11	Diverge	Diverge	Novato Blvd Off->	1500	3
12	Basic	Basic	Novato Blvd Off->SR 37 On	2650	3
13	Weaving	Weaving	SR37->Rowland Blvd	2050	4
14	Basic	Basic	Rowland Blvd Off->Rowland Blvd On	2900	3
15	Merge	Merge	Rowland Blvd On->	1200	3
16	Diverge	Diverge	De Long Off->	1200	3
17	Basic	Basic	De Long Off->De Long On	2000	3
18	Merge	Merge	De Long Ave On->	1200	3
19	Diverge	Diverge	Atherton Ave Off->	1200	3
20	Basic	Basic	Atherton Ave Off->Atherton Ave On	900	3
21	Merge	Merge	Atherton Ave On->	1000	3
22	Merge	Merge	End HOV	1000	3
23	Basic	Basic	End HOV -> Begin 2 lane fwy	5100	2

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	7629	9600	0.83	40.8	46.8	F

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	7409	928	9600	2000	0.83	0.46	28.5	-	65.1	-	F

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	6397	7200	0.98	35.5	60.1	F

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	6704	307	7200	2000	1.02	0.15	61.1	57.9	36.6	34.9	F

Segment 5: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	6704	7200	1.02	58.2	38.4	F

Segment 6: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	1.00	0.957	1.000	6704	937	7200	2000	1.02	0.47	64.2	58.3	34.8	37.7	F

Segment 7: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	5767	7200	0.89	65.7	29.3	D

Segment 8: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	6019	252	9600	2000	0.66	0.13	67.9	-	22.2	-	C

Segment 9: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	7401	1382	9600	2000	0.83	0.69	64.4	59.4	28.7	33.2	D

Segment 10: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	7401	2483	9600	4200	0.83	0.59	66.9	-	27.7	-	D

Segment 11: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	4918	389	7200	2000	0.77	0.19	65.7	59.9	25.0	31.7	D

Segment 12: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	4529	7200	0.72	72.4	20.9	C

Segment 13: Weaving

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	5029	5064	1.10	28.1	45.0	F

Segment 14: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	3849	7200	0.62	74.4	17.2	B

Segment 15: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	4476	627	7200	2000	0.71	0.31	66.8	64.5	22.3	22.1	C

Segment 16: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	4476	1833	7200	2000	0.71	0.92	60.6	55.6	24.6	28.8	D

Segment 17: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	2643	7200	0.46	74.3	11.7	B

Segment 18: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	2955	312	7200	2000	0.50	0.16	68.5	66.1	14.4	14.1	B

Segment 19: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	0.990	2955	1208	7200	2000	0.50	0.60	61.6	57.5	16.0	20.1	C

Segment 20: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	1747	7200	0.33	72.9	7.7	A

Segment 21: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	2709	962	6761	1878	0.50	0.51	65.7	64.1	13.7	11.7	B

Segment 22: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	3042	474	6761	1878	0.57	0.25	19.6	61.9	51.8	21.6	F

Segment 23: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	3042	3274	1.17	55.6	21.1	F

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	50.9	30.8	29.5	8.8	F

Facility Overall Results

Space Mean Speed, mi/h	50.9	Density, veh/mi/ln	29.5
Average Travel Time, min	8.8		

HCS7 Freeway Facilities Report

Project Information

Analyst	W-Trans	Agency	
Jurisdiction	City of Novato	Time Period Analyzed	PM Existing + Project Alt - Northbound
Analysis Year	2016	Date	6/8/17
Project Description	City of Novato General Plan Update EIR		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	23
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	Novato S City Limits->Alameda del Prado	2000	4
2	Diverge	Basic	Alameda del Prado Off->	1500	4
3	Basic	Basic	Alameda del Prado Off->Alameda del Prado On	2000	3
4	Merge	Merge	Alameda del Prado On->	1000	3
5	Basic	Basic	Alameda del Prado On->Nave Off	2600	3
6	Diverge	Diverge	Nave Off->	1000	3
7	Basic	Basic	Nave Off->Nave On	2000	3
8	Merge	Basic	Nave On->	500	4
9	Merge	Merge	Ignacio On->	1500	4
10	Diverge	Basic	SR37 Off->	1500	4
11	Diverge	Diverge	Novato Blvd Off->	1500	3
12	Basic	Basic	Novato Blvd Off->SR 37 On	2650	3
13	Weaving	Weaving	SR37->Rowland Blvd	2050	4
14	Basic	Basic	Rowland Blvd Off->Rowland Blvd On	2900	3
15	Merge	Merge	Rowland Blvd On->	1200	3
16	Diverge	Diverge	De Long Off->	1200	3
17	Basic	Basic	De Long Off->De Long On	2000	3
18	Merge	Merge	De Long Ave On->	1200	3
19	Diverge	Diverge	Atherton Ave Off->	1200	3
20	Basic	Basic	Atherton Ave Off->Atherton Ave On	900	3
21	Merge	Merge	Atherton Ave On->	1000	3
22	Merge	Merge	End HOV	1000	3
23	Basic	Basic	End HOV -> Begin 2 lane fwy	5100	2

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	7629	9600	0.83	40.8	46.8	F

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	7409	928	9600	2000	0.83	0.46	28.5	-	65.1	-	F

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	6397	7200	0.98	35.5	60.1	F

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	6704	307	7200	2000	1.02	0.15	61.1	57.9	36.6	34.9	F

Segment 5: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	6704	7200	1.02	58.2	38.4	F

Segment 6: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	1.00	0.957	1.000	6704	937	7200	2000	1.02	0.47	64.2	58.3	34.8	37.7	F

Segment 7: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	5767	7200	0.89	65.7	29.3	D

Segment 8: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	6019	252	9600	2000	0.66	0.13	67.9	-	22.2	-	C

Segment 9: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	7401	1382	9600	2000	0.83	0.69	64.4	59.4	28.7	33.2	D

Segment 10: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	7401	2483	9600	4200	0.83	0.59	66.9	-	27.7	-	D

Segment 11: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	4918	389	7200	2000	0.77	0.19	65.7	59.9	25.0	31.7	D

Segment 12: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	4529	7200	0.72	72.4	20.9	C

Segment 13: Weaving

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	5029	5064	1.10	28.1	45.0	F

Segment 14: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	3849	7200	0.62	74.4	17.2	B

Segment 15: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	4476	627	7200	2000	0.71	0.31	66.8	64.5	22.3	22.1	C

Segment 16: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	4476	1833	7200	2000	0.71	0.92	60.6	55.6	24.6	28.8	D

Segment 17: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	2643	7200	0.46	74.3	11.7	B

Segment 18: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	2955	312	7200	2000	0.50	0.16	68.5	66.1	14.4	14.1	B

Segment 19: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	0.990	2955	1208	7200	2000	0.50	0.60	61.6	57.5	16.0	20.1	C

Segment 20: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	1747	7200	0.33	72.9	7.7	A

Segment 21: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	2709	962	6761	1878	0.50	0.51	65.7	64.1	13.7	11.7	B

Segment 22: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	3042	474	6761	1878	0.57	0.25	19.6	61.9	51.8	21.6	F

Segment 23: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	3042	3274	1.17	55.6	21.1	F

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	50.9	30.8	29.5	8.8	F

Facility Overall Results

Space Mean Speed, mi/h	50.9	Density, veh/mi/ln	29.5
Average Travel Time, min	8.8		

HCS7 Freeway Facilities Report

Project Information

Analyst	W-Trans	Agency	
Jurisdiction	City of Novato	Time Period Analyzed	AM Peak Cumulative with Project Alt - Northbound
Analysis Year	2016	Date	6/8/17
Project Description	City of Novato General Plan Update EIR		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	24
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	Novato S City Limits->Alameda del Prado	2000	5
2	Diverge	Basic	Alameda del Prado Off->	1500	5
3	Basic	Basic	Alameda del Prado Off->Alameda del Prado On	2000	4
4	Merge	Merge	Alameda del Prado On->	1000	4
5	Basic	Basic	Alameda del Prado On->Nave Off	2600	4
6	Diverge	Diverge	Nave Off->	1000	4
7	Basic	Basic	Nave Off->Nave On	2000	4
8	Merge	Basic	Nave On->	500	5
9	Merge	Merge	Ignacio On->	1500	5
10	Diverge	Basic	SR37 Off->	1500	5
11	Diverge	Diverge	Novato Blvd Off->	1500	4
12	Basic	Basic	Novato Blvd Off->SR 37 On	2650	4
13	Weaving	Weaving	SR37->Rowland Blvd	2050	5
14	Basic	Basic	Rowland Blvd Off->Rowland Blvd On	2900	4
15	Merge	Merge	Rowland Blvd On->	1200	4
16	Diverge	Diverge	De Long Off->	1200	4
17	Basic	Basic	De Long Off->De Long On	2000	4
18	Merge	Merge	De Long Ave On->	1200	4
19	Diverge	Diverge	Atherton Ave Off->	1200	4
20	Basic	Basic	Atherton Ave Off->Atherton Ave On	900	4
21	Merge	Merge	Atherton Ave On->	1000	4
22	Basic	Basic	Atherton On -> End HOV	2300	3
23	Basic	Basic	End HOV	2000	2
24	Basic	Basic	End HOV -> Begin 2 lane fwy	2500	2

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	5340	12000	0.44	75.3	14.2	B

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	5340	375	12000	2000	0.44	0.19	75.3	-	14.2	-	B

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	4968	9600	0.52	74.7	16.6	B

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	5085	117	9600	2000	0.53	0.06	68.5	64.4	18.6	19.7	B

Segment 5: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	5084	9600	0.53	74.5	17.1	B

Segment 6: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	1.00	0.957	1.000	5084	877	9600	2000	0.53	0.44	67.5	58.5	18.8	25.8	C

Segment 7: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	4167	9600	0.43	75.4	13.8	B

Segment 8: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	4367	200	12000	2000	0.35	0.10	75.4	-	11.6	-	B

Segment 9: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	5126	760	12000	2000	0.43	0.38	68.8	64.0	12.1	20.5	C

Segment 10: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	5120	1036	12000	4200	0.43	0.25	75.4	-	13.6	-	B

Segment 11: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	4092	189	9600	2000	0.43	0.09	70.6	60.5	14.5	20.5	C

Segment 12: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	3904	9600	0.41	75.4	12.9	B

Segment 13: Weaving

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	4614	6742	0.69	64.5	14.4	B

Segment 14: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	3632	9600	0.38	75.4	12.0	B

Segment 15: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	4046	414	9600	2000	0.42	0.21	69.8	66.2	14.5	13.6	B

Segment 16: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	4043	865	9600	2000	0.42	0.43	67.2	58.5	15.0	19.6	B

Segment 17: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	3184	9600	0.33	75.4	10.6	A

Segment 18: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	3376	192	9600	2000	0.35	0.10	70.4	66.4	12.0	10.6	B

Segment 19: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	0.990	3374	923	9600	2000	0.35	0.46	66.3	58.3	12.7	17.3	B

Segment 20: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	2467	9600	0.26	75.4	8.2	A

Segment 21: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	2974	507	9014	1878	0.33	0.27	66.2	64.1	11.2	12.0	B

Segment 22: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.94	1.000	3024	7200	0.42	71.7	14.1	B

Segment 23: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	2971	4472	0.66	66.2	22.4	C

Segment 24: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	2971	3628	0.82	49.0	30.3	D

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	70.5	14.6	14.0	6.5	B

Facility Overall Results

Space Mean Speed, mi/h	70.5	Density, veh/mi/ln	14.0
Average Travel Time, min	6.5		

HCS7 Freeway Facilities Report

Project Information

Analyst	W-Trans	Agency	
Jurisdiction	City of Novato	Time Period Analyzed	AM Peak Cumulative with Project Alt - Southbound
Analysis Year	2016	Date	6/8/17
Project Description	City of Novato General Plan EIR		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	24
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	N Novato City Limits->San Marin Dr	3200	3
2	Diverge	Diverge	San Marin Dr Off->	1500	3
3	Basic	Basic	San Marin Dr Off->San Marin Dr On	2100	3
4	Merge	Merge	San Marin Dr On->	1175	3
5	Diverge	Diverge	De Long Ave Off->	1175	3
6	Basic	Basic	De Long Ave Off->De Long Ave On	1975	3
7	Merge	Merge	De Long Ave On->	1170	3
8	Diverge	Diverge	BEGIN HOV	200	3
9	Diverge	Diverge	Rowland Blvd Off->	1170	3
10	Basic	Basic	Rowland Blvd Off->Rowland Blvd On	3150	3
11	Merge	Merge	Rowland Blvd On->	1200	3
12	Basic	Basic	Rowland Blvd->SR37-Novato Blvd	770	3
13	Diverge	Diverge	SR37-Novato Blvd Off->	1200	3
14	Basic	Basic	SR37-Novato Blvd Off->SR37-Novato Blvd On	3400	3
15	Merge	Basic	SR37-Novato Blvd On->	1030	4
16	Diverge	Diverge	Ignacio-Enfrente Off->	1000	4
17	Diverge	Basic	BMK-Nave Off->	800	4
18	Basic	Basic	Ignacio Blvd Off->Ignacio Blvd On	1425	3
19	Merge	Merge	Ignacio Blvd On->	1500	3
20	Basic	Basic	Ignacio Blvd->Alameda Del Prado	2250	3
21	Diverge	Diverge	ADP Off->	1500	3
22	Basic	Basic	ADP Off->ADP On	1200	3
23	Merge	Basic	ADP On->	1500	3
24	Basic	Basic	Alameda Del Prado->S Novato City Limits	1000	4

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.957	6741	7200	1.00	41.4	54.2	F

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.957	0.980	6707	729	7200	2000	1.00	0.36	66.3	61.1	33.7	37.9	E

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.954	5777	7200	0.91	31.8	60.6	F

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.960	0.980	6491	762	7200	2100	1.01	0.36	39.8	53.0	54.4	38.9	F

Segment 5: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.960	0.980	6443	350	7200	2000	1.01	0.18	38.3	62.2	56.1	41.5	F

Segment 6: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.958	5961	7200	0.96	30.3	65.5	F

Segment 7: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.963	0.980	6704	743	7200	2000	1.06	0.37	60.2	56.5	37.1	36.4	F

Segment 8: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	1.00	0.963	0.990	6704	1091	7200	2200	1.06	0.50	70.0	66.5	31.9	41.6	F

Segment 9: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	

1	0.98	0.95	0.963	0.980	5613	867	7200	2000	0.90	0.43	66.1	60.7	28.3	34.5	D

Segment 10: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.960	4746	7200	0.78	71.5	22.1	C

Segment 11: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.966	0.980	5442	696	7200	2000	0.87	0.35	64.2	61.3	28.3	30.5	D

Segment 12: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.966	5442	7200	0.87	67.8	26.8	D

Segment 13: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.966	0.962	5442	327	7200	2100	0.87	0.16	69.1	64.5	26.3	33.0	D

Segment 14: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.967	5020	7200	0.83	70.2	23.8	C

Segment 15: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.966	0.962	7775	2998	9600	4000	0.62	0.75	39.8	-	48.9	-	F

Segment 16: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.966	0.980	7614	663	9600	2000	0.92	0.33	36.1	61.3	52.7	36.2	F

Segment 17: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.964	0.980	6800	1023	9600	2000	0.86	0.51	24.0	-	70.8	-	F

Segment 18: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.962	5650	7200	1.00	25.6	73.5	F

Segment 19: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.965	0.980	6248	684	7200	2000	1.10	0.34	34.9	42.2	59.6	43.8	F

Segment 20: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.965	6119	7200	1.09	32.5	62.7	F

Segment 21: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.932	0.980	6032	215	7200	2000	1.13	0.11	30.3	62.6	66.4	47.1	F

Segment 22: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.931	5736	7200	1.10	26.1	73.3	F

Segment 23: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.934	0.980	6704	968	7200	2000	1.10	0.48	60.3	-	37.1	-	F

Segment 24: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.934	6704	9600	0.93	70.1	23.9	C

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	41.6	46.3	44.3	10.0	F

Facility Overall Results

Space Mean Speed, mi/h	41.6	Density, veh/mi/ln	44.3
Average Travel Time, min	10.0		

HCS7 Freeway Facilities Report

Project Information

Analyst	W-Trans	Agency	
Jurisdiction	City of Novato	Time Period Analyzed	PM Cumulative with Project Alternative - Northbound
Analysis Year	2016	Date	6/8/17
Project Description	City of Novato General Plan Update EIR		

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	23
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	Novato S City Limits->Alameda del Prado	2000	4
2	Diverge	Basic	Alameda del Prado Off->	1500	4
3	Basic	Basic	Alameda del Prado Off->Alameda del Prado On	2000	3
4	Merge	Merge	Alameda del Prado On->	1000	3
5	Basic	Basic	Alameda del Prado On->Nave Off	2600	3
6	Diverge	Diverge	Nave Off->	1000	3
7	Basic	Basic	Nave Off->Nave On	2000	3
8	Merge	Basic	Nave On->	500	4
9	Merge	Merge	Ignacio On->	1500	4
10	Diverge	Basic	SR37 Off->	1500	4
11	Diverge	Diverge	Novato Blvd Off->	1500	3
12	Basic	Basic	Novato Blvd Off->SR 37 On	2650	3
13	Weaving	Weaving	SR37->Rowland Blvd	2050	4
14	Basic	Basic	Rowland Blvd Off->Rowland Blvd On	2900	3
15	Merge	Merge	Rowland Blvd On->	1200	3
16	Diverge	Diverge	De Long Off->	1200	3
17	Basic	Basic	De Long Off->De Long On	2000	3
18	Merge	Merge	De Long Ave On->	1200	3
19	Diverge	Diverge	Atherton Ave Off->	1200	3
20	Basic	Basic	Atherton Ave Off->Atherton Ave On	900	3
21	Merge	Merge	Atherton Ave On->	1000	3
22	Merge	Merge	End HOV	1000	3
23	Basic	Basic	End HOV -> Begin 2 lane fwy	5100	2

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	7602	9600	0.90	25.3	75.2	F

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	7404	932	9600	2000	0.90	0.47	25.0	-	74.1	-	F

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	6397	7200	1.07	35.2	60.6	F

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	6704	307	7200	2000	1.11	0.15	61.1	57.9	36.6	34.9	F

Segment 5: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	6704	7200	1.11	58.2	38.4	F

Segment 6: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	1.00	0.957	1.000	6704	943	7200	2000	1.11	0.47	64.2	58.3	34.8	37.8	F

Segment 7: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	5761	7200	0.98	65.7	29.2	D

Segment 8: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	6016	255	9600	2000	0.73	0.13	67.9	-	22.2	-	C

Segment 9: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	7418	1402	9600	2000	0.90	0.70	64.3	59.3	28.8	33.4	D

Segment 10: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	7418	2751	9600	4200	0.90	0.66	65.9	-	28.1	-	D

Segment 11: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	4667	397	7200	2000	0.82	0.20	65.6	59.9	23.7	30.6	D

Segment 12: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	4270	7200	0.77	73.3	19.4	C

Segment 13: Weaving

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	4734	4734	1.13	26.3	45.0	F

Segment 14: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	3562	7200	0.67	74.5	15.8	B

Segment 15: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	4202	640	7200	2000	0.76	0.32	67.1	64.9	20.9	20.8	C

Segment 16: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	4202	1877	7200	2000	0.76	0.94	60.2	55.5	23.3	27.7	C

Segment 17: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	2325	7200	0.50	74.3	10.3	A

Segment 18: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	2649	324	7200	2000	0.55	0.16	68.7	66.3	12.9	12.6	B

Segment 19: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	0.990	2649	1301	7200	2000	0.55	0.65	60.7	57.2	14.5	18.7	B

Segment 20: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	1348	7200	0.37	72.7	6.0	A

Segment 21: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	2325	977	6761	1878	0.54	0.52	65.8	64.3	11.8	9.8	A

Segment 22: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	3049	868	6761	1878	0.66	0.46	17.8	60.5	57.2	25.9	F

Segment 23: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	3049	3274	1.37	55.6	21.1	F

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	46.9	32.8	31.3	9.6	F

Facility Overall Results

Space Mean Speed, mi/h	46.9	Density, veh/mi/ln	31.3
Average Travel Time, min	9.6		

HCS7 Freeway Facilities Report

Project Information

Analyst	W-Trans	Agency	
Jurisdiction	City of Novato	Time Period Analyzed	PM Cumulative with Project Alternative - Southbound
Analysis Year	2016	Date	6/8/17
Project Description			

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	24
Total Time Periods	1	Time Period Duration, min	15

Segment Geometric Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	N Novato City Limits->San Marin Dr	3753	3
2	Diverge	Diverge	San Marin Dr Off->	1500	3
3	Basic	Basic	San Marin Dr Off->San Marin Dr On	2100	3
4	Merge	Merge	San Marin Dr On->	1175	3
5	Diverge	Diverge	De Long Ave Off->	1175	3
6	Basic	Basic	De Long Ave Off->De Long Ave On	1975	3
7	Merge	Basic	De Long Ave On->	1170	3
8	Diverge	Diverge	BEGIN HOV	200	4
9	Diverge	Diverge	Rowland Blvd Off->	1170	4
10	Basic	Basic	Rowland Blvd Off->Rowland Blvd On	3150	4
11	Merge	Merge	Rowland Blvd On->	1200	4
12	Basic	Basic	Rowland Blvd->SR37-Novato Blvd	770	4
13	Diverge	Diverge	SR37-Novato Blvd Off->	1200	4
14	Basic	Basic	SR37-Novato Blvd Off->SR37-Novato Blvd On	3400	4
15	Merge	Basic	SR37-Novato Blvd On->	1030	5
16	Diverge	Diverge	Ignacio-Enfrente Off->	1000	5
17	Diverge	Basic	BMK-Nave Off->	800	5
18	Basic	Basic	Ignacio Blvd Off->Ignacio Blvd On	1425	4
19	Merge	Merge	Ignacio Blvd On->	1500	4
20	Basic	Basic	Ignacio Blvd->Alameda Del Prado	2250	4
21	Diverge	Diverge	ADP Off->	1500	4
22	Basic	Basic	ADP Off->ADP On	1200	4
23	Merge	Merge	ADP On->	1500	4
24	Basic	Basic	Alameda Del Prado->S Novato City Limits	1000	4

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.957	4002	7200	0.56	74.1	18.0	B

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.957	0.980	4002	445	7200	2000	0.56	0.22	63.9	58.0	20.9	26.3	C

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.954	3571	7200	0.50	74.9	15.9	B

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.960	0.980	4726	1177	7200	2000	0.66	0.59	64.8	62.1	24.3	28.5	D

Segment 5: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.960	0.980	4714	222	7200	2000	0.65	0.11	67.8	62.6	23.2	28.8	D

Segment 6: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.958	4503	7200	0.63	72.5	20.7	C

Segment 7: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.963	0.980	5638	1158	7200	2000	0.62	0.58	66.6	-	28.2	-	D

Segment 8: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	1.00	0.963	0.990	5622	0	9600	2200	0.59	0.00	75.2	69.8	18.7	27.4	C

Segment 9: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	

1	0.98	0.95	0.963	0.980	5622	532	9600	2000	0.59	0.27	70.2	61.7	20.0	27.0	C

Segment 10: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.960	5114	9600	0.53	74.4	17.2	B

Segment 11: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.966	0.980	6549	1467	9600	2000	0.68	0.73	65.7	61.2	24.9	30.3	D

Segment 12: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.966	6525	9600	0.68	70.8	23.0	C

Segment 13: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.966	0.962	6525	754	9600	2100	0.68	0.36	70.7	63.2	23.1	31.5	D

Segment 14: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.967	5791	9600	0.60	73.0	19.8	C

Segment 15: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.966	0.962	7369	1572	12000	4000	0.48	0.39	72.8	-	20.2	-	C

Segment 16: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.966	0.980	7315	613	12000	2000	0.61	0.31	70.6	61.4	16.6	24.7	C

Segment 17: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.964	0.980	6726	812	12000	2000	0.56	0.41	74.0	-	18.2	-	C

Segment 18: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.962	5938	9600	0.62	72.6	20.4	C

Segment 19: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.965	0.980	6934	1015	9600	2000	0.72	0.51	66.0	61.6	26.3	29.6	D

Segment 20: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.965	6919	9600	0.72	69.3	25.0	C

Segment 21: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.932	0.980	7164	347	9600	2000	0.75	0.17	70.3	62.2	25.5	28.7	D

Segment 22: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.931	6817	9600	0.71	69.7	24.4	C

Segment 23: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.934	0.980	7520	725	9600	2000	0.78	0.36	67.4	64.6	27.9	22.7	C

Segment 24: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.934	7533	9600	0.78	66.5	28.3	D

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	70.3	21.6	20.7	6.0	C

Facility Overall Results

Space Mean Speed, mi/h	70.3	Density, veh/mi/ln	20.7
Average Travel Time, min	6.0		

HCS7 Basic Freeway Report

Project Information

Analyst	W-Trans	Date	6/9/2017
Agency		Analysis Year	2017
Jurisdiction	City of Novato	Time Period Analyzed	AM Existing+Project Alt - Eastbound
Project Description			

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	0.80
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	72.7
Right-Side Lateral Clearance, ft	6		

Adjustment Factors

Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.968
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Volume (V), veh/h	1141	Heavy Vehicle Adjustment Factor (f_{HV})	0.971
Peak Hour Factor (PHF)	0.95	Flow Rate (v_p), pc/h/ln	618
Total Trucks, %	3.00	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2323
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.27
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	70.9
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	8.7
Total Ramp Density Adjustment	2.7	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	70.9		

HCS7 Basic Freeway Report

Project Information

Analyst	W-Trans	Date	6/9/2017
Agency		Analysis Year	2017
Jurisdiction	City of Novato	Time Period Analyzed	AM Existing+Project Alt - Westbound
Project Description			

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	0.80
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	72.7
Right-Side Lateral Clearance, ft	6		

Adjustment Factors

Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.968
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Volume (V), veh/h	2340	Heavy Vehicle Adjustment Factor (f_{HV})	0.971
Peak Hour Factor (PHF)	0.95	Flow Rate (v_p), pc/h/ln	1268
Total Trucks, %	3.00	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2323
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.55
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	70.5
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	18.0
Total Ramp Density Adjustment	2.7	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	70.9		

HCS7 Basic Freeway Report

Project Information

Analyst	W-Trans	Date	6/9/2017
Agency		Analysis Year	2017
Jurisdiction	City of Novato	Time Period Analyzed	PM Existing+Project Alt - Eastbound
Project Description			

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	0.80
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	72.7
Right-Side Lateral Clearance, ft	6		

Adjustment Factors

Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.968
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Volume (V), veh/h	2455	Heavy Vehicle Adjustment Factor (f_{HV})	0.971
Peak Hour Factor (PHF)	0.95	Flow Rate (v_p), pc/h/ln	1330
Total Trucks, %	3.00	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2323
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.57
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	70.2
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	18.9
Total Ramp Density Adjustment	2.7	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	70.9		

HCS7 Basic Freeway Report

Project Information

Analyst	W-Trans	Date	6/9/2017
Agency		Analysis Year	2017
Jurisdiction	City of Novato	Time Period Analyzed	PM Existing+Project Alt - Westbound
Project Description			

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	0.80
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	72.7
Right-Side Lateral Clearance, ft	6		

Adjustment Factors

Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.968
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Volume (V), veh/h	1361	Heavy Vehicle Adjustment Factor (f_{HV})	0.971
Peak Hour Factor (PHF)	0.95	Flow Rate (v_p), pc/h/ln	738
Total Trucks, %	3.00	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2323
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.32
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	70.9
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	10.4
Total Ramp Density Adjustment	2.7	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	70.9		

HCS7 Basic Freeway Report

Project Information

Analyst	W-Trans	Date	6/9/2017
Agency		Analysis Year	2017
Jurisdiction	City of Novato	Time Period Analyzed	AM Cumulative with Project Alternative - Eastbound
Project Description			

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	0.80
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	72.7
Right-Side Lateral Clearance, ft	6		

Adjustment Factors

Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.968
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Volume (V), veh/h	1141	Heavy Vehicle Adjustment Factor (f_{HV})	0.971
Peak Hour Factor (PHF)	0.95	Flow Rate (v_p), pc/h/ln	618
Total Trucks, %	3.00	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2323
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.27
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	70.9
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	8.7
Total Ramp Density Adjustment	2.7	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	70.9		

HCS7 Basic Freeway Report

Project Information

Analyst	W-Trans	Date	6/9/2017
Agency		Analysis Year	2017
Jurisdiction	City of Novato	Time Period Analyzed	AM Cumulative with Project Alternative - Westbound
Project Description			

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	0.80
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	72.7
Right-Side Lateral Clearance, ft	6		

Adjustment Factors

Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.968
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Volume (V), veh/h	2514	Heavy Vehicle Adjustment Factor (f_{HV})	0.971
Peak Hour Factor (PHF)	0.95	Flow Rate (v_p), pc/h/ln	1362
Total Trucks, %	3.00	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2323
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.59
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	70.0
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	19.5
Total Ramp Density Adjustment	2.7	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	70.9		

HCS7 Basic Freeway Report

Project Information

Analyst	W-Trans	Date	6/9/2017
Agency		Analysis Year	2017
Jurisdiction	City of Novato	Time Period Analyzed	PM Cumulative with Project Alternative - Eastbound
Project Description			

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	0.80
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	72.7
Right-Side Lateral Clearance, ft	6		

Adjustment Factors

Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.968
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Volume (V), veh/h	2692	Heavy Vehicle Adjustment Factor (f_{HV})	0.971
Peak Hour Factor (PHF)	0.95	Flow Rate (v_p), pc/h/ln	1459
Total Trucks, %	3.00	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2323
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.63
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	69.2
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	21.1
Total Ramp Density Adjustment	2.7	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	70.9		

HCS7 Basic Freeway Report

Project Information

Analyst	W-Trans	Date	6/9/2017
Agency		Analysis Year	2017
Jurisdiction	City of Novato	Time Period Analyzed	PM Cumulative with Project Alternative - Westbound
Project Description			

Geometric Data

Number of Lanes (N), ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	0.80
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	72.7
Right-Side Lateral Clearance, ft	6		

Adjustment Factors

Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.968
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Volume (V), veh/h	1465	Heavy Vehicle Adjustment Factor (f_{HV})	0.971
Peak Hour Factor (PHF)	0.95	Flow Rate (v_p), pc/h/ln	794
Total Trucks, %	3.00	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2323
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.34
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	70.9
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	11.2
Total Ramp Density Adjustment	2.7	Level of Service (LOS)	B
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	70.9		

Memorandum

Date: September 10, 2019

Project: NOV126

To: Mr. Steve Marshall
City of Novato

From: Zack Matley
zmatley@w-trans.com

Copy: Mr. Matt Maddox
Rincon Consultants

Subject: Additional General Plan Circulation Analysis – Evaluation of 300,000 s.f. of additional development associated with the Bel Marin Industrial Parks Biotech zoning overlay area

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The traffic analysis conducted for General Plan 2035 includes 500,000 square feet of new development related to potential intensification of health science uses in the Bel Marin Industrial Parks MPA. The analysis identifies several traffic operation impacts at and near the Bel Marin Keys Boulevard-Ignacio Boulevard interchange at US 101. One of these impacts, at the intersection of US 101 South Ramps/Ignacio Boulevard-Enfrente Road, could be mitigated through modifications to the freeway offramp and signal coordination, but is deemed significant and unavoidable because improvements would need to be made on Caltrans facilities outside of the City's jurisdiction and the City cannot guarantee their implementation. The significant and unavoidable impact affects both this intersection and the Bel Marin Keys Boulevard roadway segment, which is part of the regional Congestion Management Plan (CMP) roadway network.

As requested by the City, W-Trans has completed an additional focused analysis of the Bel Marin Keys Boulevard-Ignacio Boulevard interchange area assuming the addition of 300,000 square feet of additional health sciences uses in the Industrial Parks MPA instead of 500,000 square feet previously analyzed.

Study Area

The focused study area including the following intersections (intersection numbers reflect those also used in the General Plan EIR).

31. Ignacio Boulevard/Alameda del Prado
32. US 101 South/Ignacio Boulevard-Enfrente Road
33. US 101 North/Bel Marin Keys Boulevard-Nave Drive
34. Bel Marin Keys Boulevard/Commercial Boulevard
35. Bel Marin Keys Boulevard/Digital Drive
36. US 101 North/Nave Drive

The roadway segment of Bel Marin Keys Drive between US 101 and Digital Drive, as well as the US 101 and SR 37 freeway segments within Novato are CMP transportation facilities that were also included in the analysis.

Trip Generation

The number of added vehicle trips associated with the potential health science uses was determined using the same methodology applied in the General Plan EIR. Customized trip generation rates were developed as described in the January 16, 2018 memorandum prepared for the City by W-Trans, titled *Revised Trip Generation for the Bel Marin Industrial Barks Biotech Overlay Traffic Analysis*. The methodology uses a mix of rates from the ITE *Trip Generation Manual*, with the proportions of individual land uses based on information available for campuses planned by Genentech and Gilead in the Bay Area, and an additional ten percent reduction in auto trips associated with mandatory implementation of transportation demand management (TDM) measures. The added 300,000 square feet of health sciences uses is estimated to generate approximately 1,858 vehicle trips per day, including 227 trips both during the a.m. peak hour and p.m. peak hour.

Results

The results of the analysis indicate that, with 300,000 square feet instead of 500,000 square feet of added health sciences uses, all six analyzed study intersections are expected to operate acceptably at LOS D or better during both the a.m. and p.m. peak hours under both Existing plus Project and Cumulative conditions. The intersection impacts identified in the General Plan EIR at US 101 South Ramps/Ignacio Boulevard-Enfrente Road (#32) and Bel Marin Keys Boulevard/Digital Drive (#35) are no longer projected to occur with the reduced development level.

The Bel Marin Keys Boulevard CMP roadway segment is projected to operate acceptably at LOS D or better during the p.m. peak hour under Existing plus Project and Cumulative conditions, in comparison to the unacceptable LOS E operation projected to occur under Cumulative conditions with the higher health sciences development levels assumed in the General Plan EIR. Both US 101 and SR 37 would also be expected to operate acceptably according to CMP criteria.

The intersection, roadway, and freeway level of service results are summarized in Tables 1 through 3, which are attached to this memorandum along with copies of the calculation sheets.

Conclusion

The significant and unavoidable traffic impacts to the intersection of US 101 South Ramps/Ignacio Boulevard-Enfrente Road (#32) and the Bel Marin Keys CMP roadway segment would no longer be expected to occur with development of the reduced 300,000 square feet of health sciences uses in the Industrial Parks MPA.

We would like to offer one additional point regarding establishment of a square-footage based metric for health sciences uses in the Industrial Parks MPA. From a traffic perspective, the critical variable in determining significance is the number of peak hour trips added to the surrounding network, rather than the amount of new development. The above analysis and that completed for the DEIR use conservatively-developed trip generation rates that capture a wide range of potential health science tenants ranging from small-scale operations to large campus expansions, as is appropriate for a programmatic General Plan EIR. Individual health science applicants may ultimately be able to generate fewer trips per square foot than analyzed. Larger campus-type facilities in particular have the potential to internalize some trips (e.g., by providing onsite dining, services, and/or child care) and can also implement robust TDM

measures more easily than smaller tenants. The City may wish to consider these influences when evaluating specific health sciences development applications. For example, if a specific project were able to provide evidence of a lower per-square-foot trip generation rate, be required by the City to monitor TDM effectiveness and auto trips generated over time, and comply with other development and zoning requirements, it may be possible to allow a larger building size without generating unanticipated traffic impacts.

We hope this information is useful to City staff and decision makers as General Plan 2035 advances toward adoption.

Table 1 – Intersection Levels of Service with 300,000 square foot Industrial Parks Overlay

Study Intersection ***Approach***	**AM Peak Hour**						**PM Peak Hour**					
	Existing Conditions		**Existing +Project**		**Cumulative Conditions**		**Existing Conditions**		**Existing +Project**		**Cumulative Conditions**	
	Delay	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**
31. Ignacio Blvd/Alameda del Prado	19.1	B	18.9	B	19.3	B	16.5	B	16.4	B	16.9	B
32. US 101 S/Ignacio Blvd-Enfrente Rd	29.8	C	44.1	D	49.4	D	23.0	C	28.6	C	30.0	C
33. US 101 N/Bel Marin Keys Blvd-Nave Dr	20.1	C	31.8	C	33.6	C	20.9	C	25.3	C	26.4	C
34. Bel Marin Keys Blvd/Commercial Blvd	7.3	A	7.6	A	7.6	A	16.9	B	19.3	B	20.7	C
35. Bel Marin Keys Blvd/Digital Dr	12.4	B	12.2	B	12.5	B	24.8	C	39.2	D	44.3	D
36. US 101 N/Nave Dr	13.6	B	15.7	B	16.0	B	13.1	B	14.7	B	15.1	B

Notes: Results are expressed as Delay/LOS; Delay is measured in average seconds per vehicle; LOS = Level of Service

Table 2 – PM Peak Hour Roadway LOS on Bel Marin Keys Boulevard with 300,000 square foot Industrial Parks Overlay

	Existing Conditions			Existing plus Project			Cumulative Conditions		
	Speed	%FFS	LOS	Speed	%FFS	LOS	Speed	%FFS	LOS
US 101 to Digital Drive									
Eastbound	18	51%	C	16	46%	D	16	46%	D
Westbound	19	54%	C	18	51%	C	17	49%	D

Notes: Speed is measured in miles per hour; LOS = Level of Service; % FFS=percent free-flow speed; free-flow speed is 35 mph

Table 3 – PM Peak Hour Freeway LOS with 300,000 square foot Industrial Parks Overlay

	Existing Conditions			Existing plus Project			Cumulative Conditions		
	Speed	Density	LOS	Speed	Density	LOS	Speed	Density	LOS
US 101									
Northbound	55.6	28.2	D	53.8	28.9	D	47.7	32.7	D
Southbound	≥65.0	17.7	B	≥65.0	19.9	C	≥65.0	22.0	C
SR 37									
Eastbound	≥65.0	18.2	C	≥65.0	18.8	C	≥65.0	21.0	C
Westbound	≥65.0	9.8	A	≥65.0	10.1	A	≥65.0	10.9	A

Notes: Density is measured in passenger cars per mile per lane; LOS = Level of Service; Results reflect average conditions for the length of US 101 within Novato (some sub-segments operate at a lower LOS such as in the northern portion of the City approaching the Marin-Sonoma Narrows)

JZM/NOV126.M3

Attachments: Intersection, Roadway Segment, and Freeway Level of Service Calculations

HCM Signalized Intersection Capacity Analysis
31: Alameda Del Prado & Ignacio Blvd

07/02/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	870	448	255	357	18	67	4	230	7	2	0
Future Volume (vph)	12	870	448	255	357	18	67	4	230	7	2	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.6	3.6	3.0	3.6			3.5	3.5		3.7	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00			1.00	0.98		1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00			0.99	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	0.99			1.00	0.85		1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00		0.96	
Satd. Flow (prot)	1770	3610	1573	1900	3584			1786	1589		1824	
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.73	1.00		0.85	
Satd. Flow (perm)	1770	3610	1573	1805	3584			1371	1589		1609	
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)	12	906	467	266	372	19	70	4	240	7	2	0
RTOR Reduction (vph)	0	0	86	0	2	0	0	0	208	0	0	0
Lane Group Flow (vph)	13	906	381	266	389	0	0	74	32	0	9	0
Confl. Peds. (#/hr)			4				7		4	4		7
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2				8		8	4		
Actuated Green, G (s)	1.3	49.3	49.3	27.4	75.4			13.2	13.2		13.0	
Effective Green, g (s)	1.3	49.3	49.3	27.4	75.4			13.2	13.2		13.0	
Actuated g/C Ratio	0.01	0.49	0.49	0.27	0.75			0.13	0.13		0.13	
Clearance Time (s)	3.0	3.6	3.6	3.0	3.6			3.5	3.5		3.7	
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0			2.0	2.0		2.0	
Lane Grp Cap (vph)	23	1779	775	520	2702			180	209		209	
v/s Ratio Prot	0.01	c0.25		c0.14	0.11							
v/s Ratio Perm			0.24					c0.05	0.02		0.01	
v/c Ratio	0.57	0.51	0.49	0.51	0.14			0.41	0.15		0.04	
Uniform Delay, d1	49.1	17.2	17.0	30.6	3.4			39.8	38.4		38.1	
Progression Factor	1.00	1.00	1.00	0.60	0.50			1.00	1.00		1.00	
Incremental Delay, d2	17.6	1.0	2.2	0.3	0.1			0.6	0.1		0.0	
Delay (s)	66.6	18.2	19.2	18.7	1.8			40.4	38.6		38.1	
Level of Service	E	B	B	B	A			D	D		D	
Approach Delay (s)		19.0			8.7			39.0			38.1	
Approach LOS		B			A			D			D	

Intersection Summary				
HCM 2000 Control Delay	18.9	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.50			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.3	
Intersection Capacity Utilization	62.9%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
32: US 101 SB Off Ramp/Enfrente Rd & Ignacio Blvd

07/02/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	837	307	194	427	41	0	0	1063	264	137	211
Future Volume (vph)	34	837	307	194	427	41	0	0	1063	264	137	211
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			2%			0%	
Total Lost time (s)	3.0	8.0	8.0	4.0	5.0				4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95				0.88		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.96	1.00	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	1.00	0.85	1.00	0.99				0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00				1.00		0.97	1.00
Satd. Flow (prot)	1805	3610	1550	1787	3545				2814		1809	1578
Flt Permitted	0.95	1.00	1.00	0.95	1.00				1.00		0.97	1.00
Satd. Flow (perm)	1805	3610	1550	1787	3545				2814		1809	1578
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)	35	872	320	202	445	43	0	0	1107	275	143	220
RTOR Reduction (vph)	0	0	135	0	6	0	0	0	325	0	0	158
Lane Group Flow (vph)	35	872	185	202	482	0	0	0	782	0	418	62
Confl. Peds. (#/hr)			7			20						1
Confl. Bikes (#/hr)						3						
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	5%	1%
Turn Type	Prot	NA	Perm	Prot	NA				Over	Split	NA	Perm
Protected Phases	5	2		1	6				1	7	7	
Permitted Phases			2									7
Actuated Green, G (s)	6.6	28.8	28.8	27.2	53.4				27.2		28.0	28.0
Effective Green, g (s)	6.6	28.8	28.8	27.2	53.4				27.2		28.0	28.0
Actuated g/C Ratio	0.07	0.29	0.29	0.27	0.53				0.27		0.28	0.28
Clearance Time (s)	3.0	8.0	8.0	4.0	5.0				4.0		4.0	4.0
Vehicle Extension (s)	2.0	2.5	2.5	3.0	4.0				3.0		2.5	2.5
Lane Grp Cap (vph)	119	1039	446	486	1893				765		506	441
v/s Ratio Prot	0.02	c0.24		0.11	0.14				c0.28		c0.23	
v/s Ratio Perm			0.12									0.04
v/c Ratio	0.29	0.84	0.42	0.42	0.25				1.02		0.83	0.14
Uniform Delay, d1	44.5	33.4	28.8	29.9	12.6				36.4		33.7	27.0
Progression Factor	0.91	0.67	0.46	1.59	1.89				1.00		1.00	1.00
Incremental Delay, d2	0.5	7.5	2.6	0.5	0.3				38.4		10.4	0.1
Delay (s)	40.8	30.0	16.0	48.1	24.1				74.8		44.1	27.1
Level of Service	D	C	B	D	C				E		D	C
Approach Delay (s)		26.6			31.1			74.8			38.2	
Approach LOS		C			C			E			D	

Intersection Summary				
HCM 2000 Control Delay	44.1	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.89			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	95.6%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
33: Nave Dr & Ignacio Blvd/Bel Marin Keys Blvd 07/02/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	868	1293	100	222	213	443	526	645	0	0	0
Future Volume (vph)	0	868	1293	100	222	213	443	526	645	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.6	3.0	4.0		4.6	4.6	3.0			
Lane Util. Factor		0.95	1.00	1.00	0.95		0.91	0.91	1.00			
Frpb, ped/bikes		1.00	1.00	1.00	0.99		1.00	1.00	0.99			
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00			
Frt		1.00	0.85	1.00	0.93		1.00	1.00	0.85			
Flt Protected		1.00	1.00	0.95	1.00		0.95	0.99	1.00			
Satd. Flow (prot)		3610	1607	1805	3290		1643	3397	1599			
Flt Permitted		1.00	1.00	0.95	1.00		0.95	0.99	1.00			
Satd. Flow (perm)		3610	1607	1805	3290		1643	3397	1599			
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)	0	923	1376	106	236	227	471	560	686	0	0	0
RTOR Reduction (vph)	0	0	82	0	128	0	0	0	5	0	0	0
Lane Group Flow (vph)	0	923	1294	106	335	0	334	697	681	0	0	0
Confl. Peds. (#/hr)			1			1			1			
Heavy Vehicles (%)	0%	0%	0%	0%	0%	2%	0%	1%	0%	0%	0%	0%
Turn Type		NA	pm+ov	Prot	NA		Split	NA	pm+ov			
Protected Phases		2	3	1	6		3	3	1			
Permitted Phases			2						3			
Actuated Green, G (s)		28.4	76.4	12.0	43.4		48.0	48.0	60.0			
Effective Green, g (s)		28.4	76.4	12.0	43.4		48.0	48.0	60.0			
Actuated g/C Ratio		0.28	0.76	0.12	0.43		0.48	0.48	0.60			
Clearance Time (s)		4.0	4.6	3.0	4.0		4.6	4.6	3.0			
Vehicle Extension (s)		4.0	2.0	2.0	4.0		2.0	2.0	2.0			
Lane Grp Cap (vph)		1025	1227	216	1427		788	1630	959			
v/s Ratio Prot		0.26	c0.51	0.06	0.10		0.20	0.21	c0.09			
v/s Ratio Perm			0.30						0.34			
v/c Ratio		0.90	1.05	0.49	0.23		0.42	0.43	0.71			
Uniform Delay, d1		34.4	11.8	41.1	17.8		17.0	17.0	13.9			
Progression Factor		0.96	1.35	1.19	0.93		1.00	1.00	1.00			
Incremental Delay, d2		6.1	33.7	0.6	0.4		0.1	0.1	2.0			
Delay (s)		39.1	49.6	49.8	16.9		17.1	17.1	15.9			
Level of Service		D	D	D	B		B	B	B			
Approach Delay (s)		45.4			23.0			16.6			0.0	
Approach LOS		D			C			B			A	

Intersection Summary				
HCM 2000 Control Delay	31.8	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	1.01			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.6	
Intersection Capacity Utilization	97.3%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
34: Bel Marin Keys Blvd & Commercial Blvd 07/02/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	11	73	0	9	46	1244	230	12	444	1
Future Volume (vph)	0	0	11	73	0	9	46	1244	230	12	444	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	3.0	3.9		3.0	3.5	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.86			1.00	0.85	1.00	0.98		1.00	1.00	
Flt Protected		1.00			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1620			1801	1395	1805	3511		1805	3573	
Flt Permitted		1.00			0.75	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1620			1421	1395	1805	3511		1805	3573	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	12	77	0	9	48	1309	242	13	467	1
RTOR Reduction (vph)	0	11	0	0	0	8	0	8	0	0	0	0
Lane Group Flow (vph)	0	1	0	0	77	1	48	1543	0	13	468	0
Confl. Peds. (#/hr)	3		2	2		3			3			
Heavy Vehicles (%)	2%	0%	0%	0%	0%	14%	0%	0%	0%	0%	1%	0%
Turn Type		NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		12.1			12.1	12.1	5.3	75.2		1.8	72.1	
Effective Green, g (s)		12.1			12.1	12.1	5.3	75.2		1.8	72.1	
Actuated g/C Ratio		0.12			0.12	0.12	0.05	0.75		0.02	0.72	
Clearance Time (s)		4.0			4.0	4.0	3.0	3.9		3.0	3.5	
Vehicle Extension (s)		3.0			3.0	3.0	2.5	3.0		2.5	4.0	
Lane Grp Cap (vph)		196			171	168	95	2640		32	2576	
v/s Ratio Prot		0.00					c0.03	c0.44		0.01	0.13	
v/s Ratio Perm					c0.05	0.00						
v/c Ratio		0.01			0.45	0.01	0.51	0.58		0.41	0.18	
Uniform Delay, d1		38.7			40.9	38.7	46.1	5.5		48.6	4.5	
Progression Factor		1.00			1.00	1.00	0.92	0.70		0.93	1.33	
Incremental Delay, d2		0.0			1.9	0.0	1.7	0.5		6.0	0.2	
Delay (s)		38.7			42.7	38.7	43.9	4.4		51.3	6.1	
Level of Service		D			D	D	D	A		D	A	
Approach Delay (s)		38.7			42.3			5.6			7.4	
Approach LOS		D			D			A			A	

Intersection Summary				
HCM 2000 Control Delay	7.6	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.58			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.9	
Intersection Capacity Utilization	64.6%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
35: Bel Marin Keys Blvd & Hamilton Dr/Digital Dr

07/02/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1	46	88	2	9	104	603	544	9	322	3
Future Volume (vph)	0	1	46	88	2	9	104	603	544	9	322	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	3.5	3.5	3.5		3.0	4.0		3.0	4.0	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.99	1.00	0.99		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	0.85	1.00	0.88		1.00	0.93		1.00	1.00	
Flt Protected		1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1900	1533	1803	1649		1770	3315		1805	3569	
Flt Permitted		1.00	1.00	0.76	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1900	1533	1437	1649		1770	3315		1805	3569	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1	48	93	2	9	109	635	573	9	339	3
RTOR Reduction (vph)	0	0	42	0	8	0	0	78	0	0	0	0
Lane Group Flow (vph)	0	1	6	93	3	0	109	1130	0	9	342	0
Confl. Peds. (#/hr)	1		1	1		1			2			8
Heavy Vehicles (%)	0%	0%	4%	0%	0%	0%	2%	0%	0%	0%	1%	0%
Turn Type		NA	Perm	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8								
Actuated Green, G (s)		12.6	12.6	12.6	12.6		11.2	75.1		1.8	65.7	
Effective Green, g (s)		12.6	12.6	12.6	12.6		11.2	75.1		1.8	65.7	
Actuated g/C Ratio		0.13	0.13	0.13	0.13		0.11	0.75		0.02	0.66	
Clearance Time (s)		3.5	3.5	3.5	3.5		3.0	4.0		3.0	4.0	
Vehicle Extension (s)		2.0	2.0	2.5	2.5		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)		239	193	181	207		198	2489		32	2344	
v/s Ratio Prot		0.00			0.00		c0.06	c0.34		0.00	0.10	
v/s Ratio Perm			0.00	c0.06								
v/c Ratio		0.00	0.03	0.51	0.02		0.55	0.45		0.28	0.15	
Uniform Delay, d1		38.2	38.3	40.8	38.3		42.0	4.7		48.5	6.5	
Progression Factor		1.00	1.00	1.00	1.00		1.04	1.34		1.00	1.00	
Incremental Delay, d2		0.0	0.0	1.8	0.0		1.6	0.5		1.8	0.1	
Delay (s)		38.2	38.4	42.7	38.3		45.3	6.8		50.2	6.6	
Level of Service		D	D	D	D		D	A		D	A	
Approach Delay (s)		38.4			42.2			10.0			7.8	
Approach LOS		D			D			B			A	

Intersection Summary				
HCM 2000 Control Delay	12.2	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.49			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.5	
Intersection Capacity Utilization	63.6%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
36: Nave Dr & US 101 NB Off Ramp

07/02/2019

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	744	174	0	870	1191	188
Future Volume (vph)	744	174	0	870	1191	188
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		5.0	5.0	
Lane Util. Factor	0.97	1.00		0.95	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	0.98	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3467	1563		3574	3506	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3467	1563		3574	3506	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	809	189	0	946	1295	204
RTOR Reduction (vph)	0	20	0	0	18	0
Lane Group Flow (vph)	809	169	0	946	1481	0
Confl. Peds. (#/hr)		1				
Heavy Vehicles (%)	1%	2%	0%	1%	1%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	27.0	27.0		35.0	35.0	
Effective Green, g (s)	27.0	27.0		35.0	35.0	
Actuated g/C Ratio	0.39	0.39		0.50	0.50	
Clearance Time (s)	3.0	3.0		5.0	5.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	1337	602		1787	1753	
v/s Ratio Prot	c0.23			0.26	c0.42	
v/s Ratio Perm		0.11				
v/c Ratio	0.61	0.28		0.53	0.84	
Uniform Delay, d1	17.2	14.8		11.9	15.1	
Progression Factor	1.00	1.00		0.36	1.00	
Incremental Delay, d2	2.0	1.2		1.0	5.2	
Delay (s)	19.3	16.0		5.2	20.4	
Level of Service	B	B		A	C	
Approach Delay (s)	18.6			5.2	20.4	
Approach LOS	B			A	C	

Intersection Summary				
HCM 2000 Control Delay	15.7	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.74			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	68.9%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
31: Alameda Del Prado & Ignacio Blvd

07/02/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	446	78	332	732	34	98	4	162	28	5	1
Future Volume (vph)	10	446	78	332	732	34	98	4	162	28	5	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.6	3.6	3.0	3.6			3.5	3.5		3.7	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00			1.00	0.98		1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00			0.99	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	0.99			1.00	0.85		1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00		0.96	
Satd. Flow (prot)	1770	3610	1573	1900	3586			1784	1589		1812	
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.76	1.00		0.76	
Satd. Flow (perm)	1770	3610	1573	1805	3586			1421	1589		1431	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	11	469	82	349	771	36	103	4	171	29	5	1
RTOR Reduction (vph)	0	0	30	0	2	0	0	0	146	0	1	0
Lane Group Flow (vph)	11	469	52	349	805	0	0	107	25	0	34	0
Confl. Peds. (#/hr)			4				7		4	4		7
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2				8		8	4		
Actuated Green, G (s)	1.2	47.6	47.6	27.4	73.8			14.9	14.9		14.7	
Effective Green, g (s)	1.2	47.6	47.6	27.4	73.8			14.9	14.9		14.7	
Actuated g/C Ratio	0.01	0.48	0.48	0.27	0.74			0.15	0.15		0.15	
Clearance Time (s)	3.0	3.6	3.6	3.0	3.6			3.5	3.5		3.7	
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0			2.0	2.0		2.0	
Lane Grp Cap (vph)	21	1718	748	520	2646			211	236		210	
v/s Ratio Prot	c0.01	0.13		c0.18	c0.22							
v/s Ratio Perm			0.03					c0.08	0.02		0.02	
v/c Ratio	0.52	0.27	0.07	0.67	0.30			0.51	0.11		0.16	
Uniform Delay, d1	49.1	15.8	14.2	32.3	4.4			39.2	36.8		37.3	
Progression Factor	1.00	1.00	1.00	0.73	0.75			1.00	1.00		1.00	
Incremental Delay, d2	10.4	0.4	0.2	2.4	0.3			0.7	0.1		0.1	
Delay (s)	59.5	16.2	14.4	26.1	3.6			39.9	36.9		37.4	
Level of Service	E	B	B	C	A			D	D		D	
Approach Delay (s)		16.8			10.4			38.0			37.4	
Approach LOS		B			B			D			D	

Intersection Summary				
HCM 2000 Control Delay	16.4	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.45			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.3	
Intersection Capacity Utilization	68.1%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
32: US 101 SB Off Ramp/Enfrente Rd & Ignacio Blvd/Ignacio Blvd #3

07/02/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	393	264	633	813	139	0	0	767	189	89	296
Future Volume (vph)	33	393	264	633	813	139	0	0	767	189	89	296
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			2%			0%	
Total Lost time (s)	3.0	8.0	8.0	4.0	5.0				4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95				0.88		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.96	1.00	0.99				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	1.00	0.85	1.00	0.98				0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00				1.00		0.97	1.00
Satd. Flow (prot)	1805	3610	1550	1787	3503				2814		1809	1578
Flt Permitted	0.95	1.00	1.00	0.95	1.00				1.00		0.97	1.00
Satd. Flow (perm)	1805	3610	1550	1787	3503				2814		1809	1578
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)	34	409	275	659	847	145	0	0	799	197	93	308
RTOR Reduction (vph)	0	0	201	0	10	0	0	0	409	0	0	241
Lane Group Flow (vph)	34	409	74	659	982	0	0	0	390	0	290	67
Confl. Peds. (#/hr)			7			20						1
Confl. Bikes (#/hr)						3						
Heavy Vehicles (%)	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	5%	1%
Turn Type	Prot	NA	Perm	Prot	NA				Over	Split	NA	Perm
Protected Phases	5	2		1	6				1	7	7	
Permitted Phases			2									7
Actuated Green, G (s)	6.6	26.9	26.9	35.2	59.5				35.2		21.9	21.9
Effective Green, g (s)	6.6	26.9	26.9	35.2	59.5				35.2		21.9	21.9
Actuated g/C Ratio	0.07	0.27	0.27	0.35	0.60				0.35		0.22	0.22
Clearance Time (s)	3.0	8.0	8.0	4.0	5.0				4.0		4.0	4.0
Vehicle Extension (s)	2.0	2.5	2.5	3.0	4.0				3.0		2.5	2.5
Lane Grp Cap (vph)	119	971	416	629	2084				990		396	345
v/s Ratio Prot	0.02	c0.11		c0.37	c0.28				0.14		c0.16	
v/s Ratio Perm			0.05									0.04
v/c Ratio	0.29	0.42	0.18	1.05	0.47				0.39		0.73	0.20
Uniform Delay, d1	44.5	30.1	28.1	32.4	11.4				24.4		36.3	31.9
Progression Factor	0.98	0.68	0.40	0.80	0.75				1.00		1.00	1.00
Incremental Delay, d2	0.5	1.3	0.9	39.5	0.4				0.3		6.5	0.2
Delay (s)	44.1	21.9	12.2	65.6	8.9				24.6		42.8	32.1
Level of Service	D	C	B	E	A				C		D	C
Approach Delay (s)		19.2			31.5			24.6			37.3	
Approach LOS		B			C			C			D	

Intersection Summary				
HCM 2000 Control Delay	28.6	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.79			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	81.0%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
33: Nave Dr & Ignacio Blvd #3/Bel Marin Keys Blvd #3

07/02/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	342	1013	128	703	686	868	749	264	0	0	0
Future Volume (vph)	0	342	1013	128	703	686	868	749	264	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.6	3.0	4.0		4.6	4.6	3.0			
Lane Util. Factor		0.95	1.00	1.00	0.95		0.91	0.91	1.00			
Frpb, ped/bikes		1.00	0.99	1.00	0.99		1.00	1.00	0.99			
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00			
Frt		1.00	0.85	1.00	0.93		1.00	1.00	0.85			
Flt Protected		1.00	1.00	0.95	1.00		0.95	0.98	1.00			
Satd. Flow (prot)		3610	1605	1805	3288		1643	3382	1600			
Flt Permitted		1.00	1.00	0.95	1.00		0.95	0.98	1.00			
Satd. Flow (perm)		3610	1605	1805	3288		1643	3382	1600			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	360	1066	135	740	722	914	788	278	0	0	0
RTOR Reduction (vph)	0	0	76	0	42	0	0	0	124	0	0	0
Lane Group Flow (vph)	0	360	990	135	1420	0	558	1144	154	0	0	0
Confl. Peds. (#/hr)			1			1			1			
Heavy Vehicles (%)	0%	0%	0%	0%	0%	2%	0%	1%	0%	0%	0%	0%
Turn Type		NA	pm+ov	Prot	NA		Split	NA	pm+ov			
Protected Phases		2	3	1	6		3	3	1			
Permitted Phases			2						3			
Actuated Green, G (s)		35.8	75.6	12.8	51.6		39.8	39.8	52.6			
Effective Green, g (s)		35.8	75.6	12.8	51.6		39.8	39.8	52.6			
Actuated g/C Ratio		0.36	0.76	0.13	0.52		0.40	0.40	0.53			
Clearance Time (s)		4.0	4.6	3.0	4.0		4.6	4.6	3.0			
Vehicle Extension (s)		4.0	2.0	2.0	4.0		2.0	2.0	2.0			
Lane Grp Cap (vph)		1292	1213	231	1696		653	1346	841			
v/s Ratio Prot		0.10	0.32	0.07	c0.43		c0.34	0.34	0.02			
v/s Ratio Perm			0.29						0.07			
v/c Ratio		0.28	0.82	0.58	0.84		0.85	0.85	0.18			
Uniform Delay, d1		22.9	7.8	41.1	20.6		27.5	27.4	12.4			
Progression Factor		1.08	1.03	1.00	1.00		1.00	1.00	1.00			
Incremental Delay, d2		0.5	3.6	2.4	5.1		10.2	5.0	0.0			
Delay (s)		25.3	11.6	43.5	25.7		37.7	32.4	12.5			
Level of Service		C	B	D	C		D	C	B			
Approach Delay (s)		15.1			27.2			31.1			0.0	
Approach LOS		B			C			C			A	

Intersection Summary				
HCM 2000 Control Delay	25.3	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.87			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.6	
Intersection Capacity Utilization	80.0%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
34: Bel Marin Keys Blvd #3 & Commercial Blvd

07/02/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	0	38	278	1	28	46	514	78	31	1306	7
Future Volume (vph)	3	0	38	278	1	28	46	514	78	31	1306	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	3.0	3.9		3.0	3.5	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			1.00	0.99	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.87			1.00	0.85	1.00	0.98		1.00	1.00	
Flt Protected		1.00			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1632			1807	1396	1805	3527		1805	3572	
Flt Permitted		0.98			0.69	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1607			1316	1396	1805	3527		1805	3572	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	3	0	42	309	1	31	51	571	87	34	1451	8
RTOR Reduction (vph)	0	32	0	0	0	22	0	12	0	0	0	0
Lane Group Flow (vph)	0	13	0	0	310	9	51	646	0	34	1459	0
Confl. Peds. (#/hr)	3		2	2		3			3			
Heavy Vehicles (%)	2%	0%	0%	0%	0%	14%	0%	0%	0%	0%	1%	0%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		22.1			22.1	22.1	4.2	38.4		3.6	38.2	
Effective Green, g (s)		22.1			22.1	22.1	4.2	38.4		3.6	38.2	
Actuated g/C Ratio		0.29			0.29	0.29	0.06	0.51		0.05	0.51	
Clearance Time (s)		4.0			4.0	4.0	3.0	3.9		3.0	3.5	
Vehicle Extension (s)		3.0			3.0	3.0	2.5	3.0		2.5	4.0	
Lane Grp Cap (vph)		473			387	411	101	1805		86	1819	
v/s Ratio Prot							c0.03	0.18		0.02	c0.41	
v/s Ratio Perm		0.01			c0.24	0.01						
v/c Ratio		0.03			0.80	0.02	0.50	0.36		0.40	0.80	
Uniform Delay, d1		18.8			24.4	18.8	34.4	10.9		34.6	15.3	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.08	1.01	
Incremental Delay, d2		0.0			11.3	0.0	2.9	0.6		1.5	2.7	
Delay (s)		18.8			35.7	18.8	37.3	11.5		38.9	18.2	
Level of Service		B			D	B	D	B		D	B	
Approach Delay (s)		18.8			34.2			13.3			18.7	
Approach LOS		B			C			B			B	

Intersection Summary				
HCM 2000 Control Delay	19.3	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.79			
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	10.9	
Intersection Capacity Utilization	67.1%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
35: Bel Marin Keys Blvd #3 & Hamilton Dr/Digital Dr

07/02/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	7	154	556	4	13	45	367	117	6	639	2
Future Volume (vph)	5	7	154	556	4	13	45	367	117	6	639	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	3.5	3.5	3.5		3.0	4.0		3.0	4.0	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.98	1.00	0.99		1.00	0.99		1.00	1.00	
Flpb, ped/bikes		1.00	1.00	0.99	1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85	1.00	0.88		1.00	0.96		1.00	1.00	
Flt Protected		0.98	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1864	1522	1739	1662		1770	3381		1805	3537	
Flt Permitted		0.96	1.00	0.75	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1823	1522	1371	1662		1770	3381		1805	3537	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	8	167	604	4	14	49	399	127	7	695	2
RTOR Reduction (vph)	0	0	99	0	8	0	0	35	0	0	0	0
Lane Group Flow (vph)	0	13	68	604	10	0	49	491	0	7	697	0
Confl. Peds. (#/hr)	1		10	10		1			2			8
Confl. Bikes (#/hr)									5			5
Heavy Vehicles (%)	0%	0%	4%	3%	0%	0%	2%	2%	3%	0%	2%	0%
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8								
Actuated Green, G (s)		30.5	30.5	30.5	30.5		5.4	32.2		1.8	28.6	
Effective Green, g (s)		30.5	30.5	30.5	30.5		5.4	32.2		1.8	28.6	
Actuated g/C Ratio		0.41	0.41	0.41	0.41		0.07	0.43		0.02	0.38	
Clearance Time (s)		3.5	3.5	3.5	3.5		3.0	4.0		3.0	4.0	
Vehicle Extension (s)		2.0	2.0	2.5	2.5		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)		741	618	557	675		127	1451		43	1348	
v/s Ratio Prot					0.01		c0.03	0.15		0.00	c0.20	
v/s Ratio Perm		0.01	0.04	c0.44								
v/c Ratio		0.02	0.11	1.08	0.01		0.39	0.34		0.16	0.52	
Uniform Delay, d1		13.3	13.8	22.2	13.3		33.2	14.3		35.9	17.9	
Progression Factor		1.00	1.00	1.00	1.00		0.80	1.59		1.00	1.00	
Incremental Delay, d2		0.0	0.0	63.0	0.0		0.7	0.6		0.7	1.4	
Delay (s)		13.3	13.8	85.3	13.3		27.3	23.4		36.5	19.3	
Level of Service		B	B	F	B		C	C		D	B	
Approach Delay (s)		13.8			83.2			23.7			19.5	
Approach LOS		B			F			C			B	

Intersection Summary				
HCM 2000 Control Delay	39.2	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.77			
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	10.5	
Intersection Capacity Utilization	75.8%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
36: Nave Dr & US 101 NB Off Ramp

07/02/2019

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	714	233	0	1175	888	238
Future Volume (vph)	714	233	0	1175	888	238
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		5.0	5.0	
Lane Util. Factor	0.97	1.00		0.95	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	0.97	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3467	1563		3574	3468	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3467	1563		3574	3468	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	729	238	0	1199	906	243
RTOR Reduction (vph)	0	40	0	0	35	0
Lane Group Flow (vph)	729	198	0	1199	1114	0
Confl. Peds. (#/hr)		1				
Heavy Vehicles (%)	1%	2%	0%	1%	1%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	31.0	31.0		31.0	31.0	
Effective Green, g (s)	31.0	31.0		31.0	31.0	
Actuated g/C Ratio	0.44	0.44		0.44	0.44	
Clearance Time (s)	3.0	3.0		5.0	5.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	1535	692		1582	1535	
v/s Ratio Prot	c0.21			c0.34	0.32	
v/s Ratio Perm		0.13				
v/c Ratio	0.47	0.29		0.76	0.73	
Uniform Delay, d1	13.8	12.4		16.4	16.0	
Progression Factor	1.00	1.00		0.49	1.00	
Incremental Delay, d2	1.1	1.0		2.5	3.0	
Delay (s)	14.8	13.5		10.6	19.0	
Level of Service	B	B		B	B	
Approach Delay (s)	14.5			10.6	19.0	
Approach LOS	B			B	B	

Intersection Summary				
HCM 2000 Control Delay	14.7	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.62			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	62.5%	ICU Level of Service	B	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
31: Alameda Del Prado & Ignacio Blvd

07/02/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	886	469	268	372	19	69	4	240	7	2	0
Future Volume (vph)	13	886	469	268	372	19	69	4	240	7	2	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.6	3.6	3.0	3.6			3.5	3.5		3.7	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00			1.00	0.98		1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00			0.99	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	0.99			1.00	0.85		1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00		0.96	
Satd. Flow (prot)	1770	3610	1573	1900	3583			1786	1589		1824	
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.73	1.00		0.85	
Satd. Flow (perm)	1770	3610	1573	1805	3583			1368	1589		1608	
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)	14	923	489	279	388	20	72	4	250	7	2	0
RTOR Reduction (vph)	0	0	89	0	2	0	0	0	217	0	0	0
Lane Group Flow (vph)	14	923	400	279	406	0	0	76	33	0	9	0
Confl. Peds. (#/hr)			4				7		4	4		7
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2				8		8	4		
Actuated Green, G (s)	1.4	49.2	49.2	27.4	75.2			13.3	13.3		13.1	
Effective Green, g (s)	1.4	49.2	49.2	27.4	75.2			13.3	13.3		13.1	
Actuated g/C Ratio	0.01	0.49	0.49	0.27	0.75			0.13	0.13		0.13	
Clearance Time (s)	3.0	3.6	3.6	3.0	3.6			3.5	3.5		3.7	
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0			2.0	2.0		2.0	
Lane Grp Cap (vph)	24	1776	773	520	2694			181	211		210	
v/s Ratio Prot	0.01	c0.26		c0.15	0.11							
v/s Ratio Perm			0.25					c0.06	0.02		0.01	
v/c Ratio	0.58	0.52	0.52	0.54	0.15			0.42	0.16		0.04	
Uniform Delay, d1	49.0	17.3	17.3	30.9	3.5			39.8	38.4		38.0	
Progression Factor	1.00	1.00	1.00	0.66	0.46			1.00	1.00		1.00	
Incremental Delay, d2	21.1	1.1	2.5	0.5	0.1			0.6	0.1		0.0	
Delay (s)	70.1	18.4	19.8	21.0	1.7			40.4	38.5		38.0	
Level of Service	E	B	B	C	A			D	D		D	
Approach Delay (s)		19.4			9.5			39.0			38.0	
Approach LOS		B			A			D			D	

Intersection Summary				
HCM 2000 Control Delay	19.3	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.51			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.3	
Intersection Capacity Utilization	63.7%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
32: US 101 SB Off Ramp/Enfrente Rd & Ignacio Blvd

07/02/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	860	314	197	437	43	0	0	1079	265	143	218
Future Volume (vph)	36	860	314	197	437	43	0	0	1079	265	143	218
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			2%			0%	
Total Lost time (s)	3.0	8.0	8.0	4.0	5.0				4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95				0.88		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.96	1.00	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	1.00	0.85	1.00	0.99				0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00				1.00		0.97	1.00
Satd. Flow (prot)	1805	3610	1550	1770	3544				2759		1809	1578
Flt Permitted	0.95	1.00	1.00	0.95	1.00				1.00		0.97	1.00
Satd. Flow (perm)	1805	3610	1550	1770	3544				2759		1809	1578
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)	38	896	327	205	455	45	0	0	1124	276	149	227
RTOR Reduction (vph)	0	0	134	0	6	0	0	0	323	0	0	163
Lane Group Flow (vph)	38	896	193	205	494	0	0	0	801	0	425	64
Confl. Peds. (#/hr)			7			20						1
Confl. Bikes (#/hr)						3						
Heavy Vehicles (%)	0%	0%	0%	2%	0%	0%	0%	0%	2%	0%	5%	1%
Turn Type	Prot	NA	Perm	Prot	NA				Over	Split	NA	Perm
Protected Phases	5	2		1	6				1	7	7	
Permitted Phases			2									7
Actuated Green, G (s)	6.6	28.5	28.5	27.2	53.1				27.2		28.3	28.3
Effective Green, g (s)	6.6	28.5	28.5	27.2	53.1				27.2		28.3	28.3
Actuated g/C Ratio	0.07	0.28	0.28	0.27	0.53				0.27		0.28	0.28
Clearance Time (s)	3.0	8.0	8.0	4.0	5.0				4.0		4.0	4.0
Vehicle Extension (s)	2.0	2.5	2.5	3.0	4.0				3.0		2.5	2.5
Lane Grp Cap (vph)	119	1028	441	481	1881				750		511	446
v/s Ratio Prot	0.02	c0.25		0.12	0.14				c0.29		c0.23	
v/s Ratio Perm			0.12									0.04
v/c Ratio	0.32	0.87	0.44	0.43	0.26				1.07		0.83	0.14
Uniform Delay, d1	44.6	34.0	29.2	30.0	12.8				36.4		33.6	26.8
Progression Factor	0.98	0.72	0.55	1.56	1.85				1.00		1.00	1.00
Incremental Delay, d2	0.5	9.4	2.9	0.6	0.3				52.4		10.9	0.1
Delay (s)	44.3	34.0	18.9	47.4	24.0				88.8		44.5	26.9
Level of Service	D	C	B	D	C				F		D	C
Approach Delay (s)		30.4			30.8			88.8			38.4	
Approach LOS		C			C			F			D	

Intersection Summary				
HCM 2000 Control Delay	49.4	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.92			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	97.2%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
33: Nave Dr & Ignacio Blvd/Bel Marin Keys Blvd

07/02/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	882	1311	100	232	222	447	543	670	0	0	0
Future Volume (vph)	0	882	1311	100	232	222	447	543	670	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.6	3.0	4.0		4.6	4.6	3.0			
Lane Util. Factor		0.95	1.00	1.00	0.95		0.91	0.91	1.00			
Frpb, ped/bikes		1.00	1.00	1.00	0.99		1.00	1.00	0.99			
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00			
Frt		1.00	0.85	1.00	0.93		1.00	1.00	0.85			
Flt Protected		1.00	1.00	0.95	1.00		0.95	0.99	1.00			
Satd. Flow (prot)		3539	1607	1805	3258		1643	3398	1583			
Flt Permitted		1.00	1.00	0.95	1.00		0.95	0.99	1.00			
Satd. Flow (perm)		3539	1607	1805	3258		1643	3398	1583			
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)	0	938	1395	106	247	236	476	578	713	0	0	0
RTOR Reduction (vph)	0	0	82	0	127	0	0	0	5	0	0	0
Lane Group Flow (vph)	0	938	1313	106	356	0	343	711	708	0	0	0
Confl. Peds. (#/hr)			1			1			1			
Heavy Vehicles (%)	0%	2%	0%	0%	2%	2%	0%	1%	1%	0%	0%	0%
Turn Type		NA	pm+ov	Prot	NA		Split	NA	pm+ov			
Protected Phases		2	3	1	6		3	3	1			
Permitted Phases			2						3			
Actuated Green, G (s)		28.4	76.4	12.0	43.4		48.0	48.0	60.0			
Effective Green, g (s)		28.4	76.4	12.0	43.4		48.0	48.0	60.0			
Actuated g/C Ratio		0.28	0.76	0.12	0.43		0.48	0.48	0.60			
Clearance Time (s)		4.0	4.6	3.0	4.0		4.6	4.6	3.0			
Vehicle Extension (s)		4.0	2.0	2.0	4.0		2.0	2.0	2.0			
Lane Grp Cap (vph)		1005	1227	216	1413		788	1631	949			
v/s Ratio Prot		0.27	c0.51	0.06	0.11		0.21	0.21	c0.09			
v/s Ratio Perm			0.30						0.36			
v/c Ratio		0.93	1.07	0.49	0.25		0.44	0.44	0.75			
Uniform Delay, d1		34.9	11.8	41.1	18.0		17.1	17.1	14.5			
Progression Factor		0.95	1.36	1.15	0.82		1.00	1.00	1.00			
Incremental Delay, d2		7.6	38.7	0.6	0.4		0.1	0.1	2.8			
Delay (s)		40.7	54.7	48.1	15.1		17.2	17.2	17.3			
Level of Service		D	D	D	B		B	B	B			
Approach Delay (s)		49.1			21.0			17.2			0.0	
Approach LOS		D			C			B			A	

Intersection Summary				
HCM 2000 Control Delay	33.6	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	1.03			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.6	
Intersection Capacity Utilization	98.5%	ICU Level of Service	F	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
34: Bel Marin Keys Blvd & Commercial Blvd

07/02/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	12	77	0	9	48	1269	242	13	461	1
Future Volume (vph)	0	0	12	77	0	9	48	1269	242	13	461	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	3.0	3.9		3.0	3.5	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.86			1.00	0.85	1.00	0.98		1.00	1.00	
Flt Protected		1.00			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1620			1766	1395	1805	3439		1805	3538	
Flt Permitted		1.00			0.75	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1620			1392	1395	1805	3439		1805	3538	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	13	81	0	9	51	1336	255	14	485	1
RTOR Reduction (vph)	0	11	0	0	0	8	0	8	0	0	0	0
Lane Group Flow (vph)	0	2	0	0	81	1	51	1583	0	14	486	0
Confl. Peds. (#/hr)	3		2	2		3			3			
Heavy Vehicles (%)	2%	0%	0%	2%	0%	14%	0%	2%	2%	0%	2%	0%
Turn Type		NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		12.3			12.3	12.3	6.8	75.0		1.8	70.4	
Effective Green, g (s)		12.3			12.3	12.3	6.8	75.0		1.8	70.4	
Actuated g/C Ratio		0.12			0.12	0.12	0.07	0.75		0.02	0.70	
Clearance Time (s)		4.0			4.0	4.0	3.0	3.9		3.0	3.5	
Vehicle Extension (s)		3.0			3.0	3.0	2.5	3.0		2.5	4.0	
Lane Grp Cap (vph)		199			171	171	122	2579		32	2490	
v/s Ratio Prot		0.00					c0.03	c0.46		0.01	0.14	
v/s Ratio Perm					c0.06	0.00						
v/c Ratio		0.01			0.47	0.01	0.42	0.61		0.44	0.20	
Uniform Delay, d1		38.5			40.8	38.5	44.7	5.8		48.6	5.1	
Progression Factor		1.00			1.00	1.00	0.94	0.61		0.92	1.29	
Incremental Delay, d2		0.0			2.1	0.0	0.9	0.6		6.8	0.2	
Delay (s)		38.5			42.9	38.5	42.8	4.1		51.4	6.7	
Level of Service		D			D	D	D	A		D	A	
Approach Delay (s)		38.5			42.5			5.3			8.0	
Approach LOS		D			D			A			A	

Intersection Summary				
HCM 2000 Control Delay	7.6	HCM 2000 Level of Service	A	
HCM 2000 Volume to Capacity ratio	0.60			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.9	
Intersection Capacity Utilization	65.7%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
35: Bel Marin Keys Blvd & Hamilton Dr/Digital Dr 07/02/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1	48	92	2	9	109	615	567	9	340	3
Future Volume (vph)	0	1	48	92	2	9	109	615	567	9	340	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	3.5	3.5	3.5		3.0	4.0		3.0	4.0	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.99	1.00	0.99		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	0.85	1.00	0.88		1.00	0.93		1.00	1.00	
Flt Protected		1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1900	1533	1768	1649		1770	3247		1805	3534	
Flt Permitted		1.00	1.00	0.76	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1900	1533	1409	1649		1770	3247		1805	3534	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1	51	97	2	9	115	647	597	9	358	3
RTOR Reduction (vph)	0	0	44	0	8	0	0	81	0	0	0	0
Lane Group Flow (vph)	0	1	7	97	3	0	115	1163	0	9	361	0
Confl. Peds. (#/hr)	1		1	1		1			2			8
Heavy Vehicles (%)	0%	0%	4%	2%	0%	0%	2%	2%	2%	0%	2%	0%
Turn Type		NA	Perm	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8								
Actuated Green, G (s)		12.9	12.9	12.9	12.9		11.5	74.8		1.8	65.1	
Effective Green, g (s)		12.9	12.9	12.9	12.9		11.5	74.8		1.8	65.1	
Actuated g/C Ratio		0.13	0.13	0.13	0.13		0.12	0.75		0.02	0.65	
Clearance Time (s)		3.5	3.5	3.5	3.5		3.0	4.0		3.0	4.0	
Vehicle Extension (s)		2.0	2.0	2.5	2.5		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)		245	197	181	212		203	2428		32	2300	
v/s Ratio Prot		0.00			0.00		c0.06	c0.36		0.00	0.10	
v/s Ratio Perm			0.00	c0.07								
v/c Ratio		0.00	0.03	0.54	0.01		0.57	0.48		0.28	0.16	
Uniform Delay, d1		38.0	38.1	40.7	38.0		41.9	4.9		48.5	6.8	
Progression Factor		1.00	1.00	1.00	1.00		1.06	1.32		1.00	1.00	
Incremental Delay, d2		0.0	0.0	2.4	0.0		1.8	0.6		1.8	0.1	
Delay (s)		38.0	38.1	43.1	38.0		46.0	7.1		50.2	6.9	
Level of Service		D	D	D	D		D	A		D	A	
Approach Delay (s)		38.1			42.6			10.4			8.0	
Approach LOS		D			D			B			A	

Intersection Summary				
HCM 2000 Control Delay	12.5	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.51			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.5	
Intersection Capacity Utilization	64.9%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
36: Nave Dr & US 101 NB Off Ramp 07/02/2019

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	754	174	0	887	1202	195
Future Volume (vph)	754	174	0	887	1202	195
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		5.0	5.0	
Lane Util. Factor	0.97	1.00		0.95	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	0.98	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3467	1563		3574	3504	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3467	1563		3574	3504	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	820	189	0	964	1307	212
RTOR Reduction (vph)	0	20	0	0	19	0
Lane Group Flow (vph)	820	169	0	964	1501	0
Confl. Peds. (#/hr)		1				
Heavy Vehicles (%)	1%	2%	0%	1%	1%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	27.0	27.0		35.0	35.0	
Effective Green, g (s)	27.0	27.0		35.0	35.0	
Actuated g/C Ratio	0.39	0.39		0.50	0.50	
Clearance Time (s)	3.0	3.0		5.0	5.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	1337	602		1787	1752	
v/s Ratio Prot	c0.24			0.27	c0.43	
v/s Ratio Perm		0.11				
v/c Ratio	0.61	0.28		0.54	0.86	
Uniform Delay, d1	17.3	14.8		12.0	15.3	
Progression Factor	1.00	1.00		0.37	1.00	
Incremental Delay, d2	2.1	1.2		1.0	5.6	
Delay (s)	19.4	16.0		5.4	20.9	
Level of Service	B	B		A	C	
Approach Delay (s)	18.8			5.4	20.9	
Approach LOS	B			A	C	

Intersection Summary				
HCM 2000 Control Delay	16.0	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.75			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	69.4%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
31: Alameda Del Prado & Ignacio Blvd

07/02/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	458	81	348	739	36	102	4	170	29	5	1
Future Volume (vph)	11	458	81	348	739	36	102	4	170	29	5	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.6	3.6	3.0	3.6			3.5	3.5		3.7	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00			1.00	0.98		1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00			0.99	1.00		1.00	
Frt	1.00	1.00	0.85	1.00	0.99			1.00	0.85		1.00	
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.95	1.00		0.96	
Satd. Flow (prot)	1770	3610	1573	1900	3585			1784	1589		1811	
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.76	1.00		0.75	
Satd. Flow (perm)	1770	3610	1573	1805	3585			1413	1589		1417	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	12	482	85	366	778	38	107	4	179	31	5	1
RTOR Reduction (vph)	0	0	31	0	2	0	0	0	152	0	1	0
Lane Group Flow (vph)	12	482	54	366	814	0	0	111	27	0	36	0
Confl. Peds. (#/hr)			4				7		4	4		7
Heavy Vehicles (%)	2%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%
Turn Type	Prot	NA	Perm	Prot	NA		Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2				8		8	4		
Actuated Green, G (s)	1.2	47.4	47.4	27.4	73.6			15.1	15.1		14.9	
Effective Green, g (s)	1.2	47.4	47.4	27.4	73.6			15.1	15.1		14.9	
Actuated g/C Ratio	0.01	0.47	0.47	0.27	0.74			0.15	0.15		0.15	
Clearance Time (s)	3.0	3.6	3.6	3.0	3.6			3.5	3.5		3.7	
Vehicle Extension (s)	2.0	3.0	3.0	2.0	3.0			2.0	2.0		2.0	
Lane Grp Cap (vph)	21	1711	745	520	2638			213	239		211	
v/s Ratio Prot	c0.01	0.13		c0.19	c0.23							
v/s Ratio Perm			0.03					c0.08	0.02		0.03	
v/c Ratio	0.57	0.28	0.07	0.70	0.31			0.52	0.11		0.17	
Uniform Delay, d1	49.1	16.0	14.3	32.7	4.5			39.1	36.7		37.2	
Progression Factor	1.00	1.00	1.00	0.74	0.75			1.00	1.00		1.00	
Incremental Delay, d2	21.2	0.4	0.2	3.2	0.3			1.1	0.1		0.1	
Delay (s)	70.4	16.4	14.5	27.3	3.7			40.2	36.7		37.3	
Level of Service	E	B	B	C	A			D	D		D	
Approach Delay (s)		17.2			11.0			38.1			37.3	
Approach LOS		B			B			D			D	

Intersection Summary				
HCM 2000 Control Delay	16.9	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.46			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	10.3	
Intersection Capacity Utilization	69.0%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
32: US 101 SB Off Ramp/Enfrente Rd & Ignacio Blvd/Ignacio Blvd #3

07/02/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	402	267	637	818	145	0	0	796	201	92	308
Future Volume (vph)	35	402	267	637	818	145	0	0	796	201	92	308
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Grade (%)		0%			0%			2%			0%	
Total Lost time (s)	3.0	8.0	8.0	4.0	5.0				4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95				0.88		1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.96	1.00	0.99				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	1.00	0.85	1.00	0.98				0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00				1.00		0.97	1.00
Satd. Flow (prot)	1805	3610	1550	1770	3500				2759		1809	1578
Flt Permitted	0.95	1.00	1.00	0.95	1.00				1.00		0.97	1.00
Satd. Flow (perm)	1805	3610	1550	1770	3500				2759		1809	1578
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)	36	419	278	664	852	151	0	0	829	209	96	321
RTOR Reduction (vph)	0	0	205	0	11	0	0	0	389	0	0	241
Lane Group Flow (vph)	36	419	73	664	992	0	0	0	440	0	305	80
Confl. Peds. (#/hr)			7			20						1
Confl. Bikes (#/hr)						3						
Heavy Vehicles (%)	0%	0%	0%	2%	0%	0%	0%	0%	2%	0%	5%	1%
Turn Type	Prot	NA	Perm	Prot	NA				Over	Split	NA	Perm
Protected Phases	5	2		1	6				1	7	7	
Permitted Phases			2									7
Actuated Green, G (s)	6.6	26.3	26.3	35.2	58.9				35.2		22.5	22.5
Effective Green, g (s)	6.6	26.3	26.3	35.2	58.9				35.2		22.5	22.5
Actuated g/C Ratio	0.07	0.26	0.26	0.35	0.59				0.35		0.22	0.22
Clearance Time (s)	3.0	8.0	8.0	4.0	5.0				4.0		4.0	4.0
Vehicle Extension (s)	2.0	2.5	2.5	3.0	4.0				3.0		2.5	2.5
Lane Grp Cap (vph)	119	949	407	623	2061				971		407	355
v/s Ratio Prot	0.02	c0.12		c0.38	c0.28				0.16		c0.17	
v/s Ratio Perm			0.05									0.05
v/c Ratio	0.30	0.44	0.18	1.07	0.48				0.45		0.75	0.23
Uniform Delay, d1	44.5	30.7	28.5	32.4	11.8				25.0		36.1	31.6
Progression Factor	0.98	0.69	0.44	0.81	0.75				1.00		1.00	1.00
Incremental Delay, d2	0.5	1.5	0.9	44.9	0.4				0.3		7.0	0.2
Delay (s)	44.1	22.7	13.4	71.2	9.2				25.3		43.1	31.9
Level of Service	D	C	B	E	A				C		D	C
Approach Delay (s)		20.2			33.9			25.3			37.4	
Approach LOS		C			C			C			D	

Intersection Summary				
HCM 2000 Control Delay	30.0	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.81			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0	
Intersection Capacity Utilization	82.2%	ICU Level of Service	E	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
33: Nave Dr & Ignacio Blvd #3/Bel Marin Keys Blvd #3

07/02/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	362	1044	127	734	696	870	769	269	0	0	0
Future Volume (vph)	0	362	1044	127	734	696	870	769	269	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.6	3.0	4.0		4.6	4.6	3.0			
Lane Util. Factor		0.95	1.00	1.00	0.95		0.91	0.91	1.00			
Frpb, ped/bikes		1.00	0.99	1.00	0.99		1.00	1.00	0.99			
Flpb, ped/bikes		1.00	1.00	1.00	1.00		1.00	1.00	1.00			
Frt		1.00	0.85	1.00	0.93		1.00	1.00	0.85			
Flt Protected		1.00	1.00	0.95	1.00		0.95	0.98	1.00			
Satd. Flow (prot)		3539	1605	1805	3259		1643	3382	1584			
Flt Permitted		1.00	1.00	0.95	1.00		0.95	0.98	1.00			
Satd. Flow (perm)		3539	1605	1805	3259		1643	3382	1584			
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	381	1099	134	773	733	916	809	283	0	0	0
RTOR Reduction (vph)	0	0	76	0	39	0	0	0	113	0	0	0
Lane Group Flow (vph)	0	381	1023	134	1467	0	559	1166	170	0	0	0
Confl. Peds. (#/hr)			1			1			1			
Heavy Vehicles (%)	0%	2%	0%	0%	2%	2%	0%	1%	1%	0%	0%	0%
Turn Type		NA	pm+ov	Prot	NA		Split	NA	pm+ov			
Protected Phases		2	3	1	6		3	3	1			
Permitted Phases			2						3			
Actuated Green, G (s)		35.5	75.7	12.7	51.2		40.2	40.2	52.9			
Effective Green, g (s)		35.5	75.7	12.7	51.2		40.2	40.2	52.9			
Actuated g/C Ratio		0.36	0.76	0.13	0.51		0.40	0.40	0.53			
Clearance Time (s)		4.0	4.6	3.0	4.0		4.6	4.6	3.0			
Vehicle Extension (s)		4.0	2.0	2.0	4.0		2.0	2.0	2.0			
Lane Grp Cap (vph)		1256	1214	229	1668		660	1359	837			
v/s Ratio Prot		0.11	0.34	0.07	c0.45		0.34	c0.34	0.03			
v/s Ratio Perm			0.30						0.08			
v/c Ratio		0.30	0.84	0.59	0.88		0.85	0.86	0.20			
Uniform Delay, d1		23.3	8.1	41.2	21.7		27.1	27.3	12.4			
Progression Factor		1.10	1.04	1.00	1.00		1.00	1.00	1.00			
Incremental Delay, d2		0.5	4.5	2.5	7.0		9.5	5.4	0.0			
Delay (s)		26.2	13.0	43.6	28.6		36.6	32.7	12.5			
Level of Service		C	B	D	C		D	C	B			
Approach Delay (s)		16.4			29.9			30.9			0.0	
Approach LOS		B			C			C			A	

Intersection Summary				
HCM 2000 Control Delay	26.4	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.90			
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	11.6	
Intersection Capacity Utilization	81.9%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
34: Bel Marin Keys Blvd #3 & Commercial Blvd

07/02/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	3	0	40	292	1	29	48	537	82	33	1324	7
Future Volume (vph)	3	0	40	292	1	29	48	537	82	33	1324	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0	4.0	3.0	3.9		3.0	3.5	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			1.00	0.99	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.87			1.00	0.85	1.00	0.98		1.00	1.00	
Flt Protected		1.00			0.95	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1631			1754	1396	1805	3453		1805	3537	
Flt Permitted		0.98			0.69	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1608			1275	1396	1805	3453		1805	3537	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	3	0	44	324	1	32	53	597	91	37	1471	8
RTOR Reduction (vph)	0	32	0	0	0	22	0	13	0	0	1	0
Lane Group Flow (vph)	0	15	0	0	325	10	53	675	0	37	1478	0
Confl. Peds. (#/hr)	3		2	2		3			3			
Heavy Vehicles (%)	2%	0%	0%	3%	0%	14%	0%	2%	3%	0%	2%	0%
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		23.2			23.2	23.2	3.9	37.3		3.6	37.4	
Effective Green, g (s)		23.2			23.2	23.2	3.9	37.3		3.6	37.4	
Actuated g/C Ratio		0.31			0.31	0.31	0.05	0.50		0.05	0.50	
Clearance Time (s)		4.0			4.0	4.0	3.0	3.9		3.0	3.5	
Vehicle Extension (s)		3.0			3.0	3.0	2.5	3.0		2.5	4.0	
Lane Grp Cap (vph)		497			394	431	93	1717		86	1763	
v/s Ratio Prot							c0.03	0.20		0.02	c0.42	
v/s Ratio Perm		0.01			c0.25	0.01						
v/c Ratio		0.03			0.82	0.02	0.57	0.39		0.43	0.84	
Uniform Delay, d1		18.1			24.0	18.0	34.7	11.8		34.7	16.2	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.06	1.02	
Incremental Delay, d2		0.0			13.1	0.0	6.4	0.7		1.7	3.3	
Delay (s)		18.1			37.1	18.0	41.1	12.5		38.4	19.9	
Level of Service		B			D	B	D	B		D	B	
Approach Delay (s)		18.1			35.4			14.5			20.3	
Approach LOS		B			D			B			C	

Intersection Summary				
HCM 2000 Control Delay	20.7	HCM 2000 Level of Service	C	
HCM 2000 Volume to Capacity ratio	0.82			
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	10.9	
Intersection Capacity Utilization	69.5%	ICU Level of Service	C	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
35: Bel Marin Keys Blvd #3 & Hamilton Dr/Digital Dr

07/02/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	7	162	580	4	14	47	390	122	6	658	2
Future Volume (vph)	5	7	162	580	4	14	47	390	122	6	658	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		3.5	3.5	3.5	3.5		3.0	4.0		3.0	4.0	
Lane Util. Factor		1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.98	1.00	0.99		1.00	0.99		1.00	1.00	
Flpb, ped/bikes		1.00	1.00	0.99	1.00		1.00	1.00		1.00	1.00	
Frt		1.00	0.85	1.00	0.88		1.00	0.96		1.00	1.00	
Flt Protected		0.98	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1864	1522	1739	1658		1770	3382		1805	3538	
Flt Permitted		0.96	1.00	0.75	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1822	1522	1371	1658		1770	3382		1805	3538	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	8	176	630	4	15	51	424	133	7	715	2
RTOR Reduction (vph)	0	0	104	0	9	0	0	34	0	0	0	0
Lane Group Flow (vph)	0	13	72	630	10	0	51	523	0	7	717	0
Confl. Peds. (#/hr)	1		10	10		1			2			8
Confl. Bikes (#/hr)									5			5
Heavy Vehicles (%)	0%	0%	4%	3%	0%	0%	2%	2%	3%	0%	2%	0%
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8								
Actuated Green, G (s)		30.5	30.5	30.5	30.5		5.4	32.2		1.8	28.6	
Effective Green, g (s)		30.5	30.5	30.5	30.5		5.4	32.2		1.8	28.6	
Actuated g/C Ratio		0.41	0.41	0.41	0.41		0.07	0.43		0.02	0.38	
Clearance Time (s)		3.5	3.5	3.5	3.5		3.0	4.0		3.0	4.0	
Vehicle Extension (s)		2.0	2.0	2.5	2.5		2.0	4.0		2.0	4.0	
Lane Grp Cap (vph)		740	618	557	674		127	1452		43	1349	
v/s Ratio Prot					0.01		c0.03	0.15		0.00	c0.20	
v/s Ratio Perm		0.01	0.05	c0.46								
v/c Ratio		0.02	0.12	1.13	0.01		0.40	0.36		0.16	0.53	
Uniform Delay, d1		13.3	13.9	22.2	13.3		33.3	14.4		35.9	18.0	
Progression Factor		1.00	1.00	1.00	1.00		0.77	1.63		1.00	1.00	
Incremental Delay, d2		0.0	0.0	79.6	0.0		0.7	0.7		0.7	1.5	
Delay (s)		13.3	13.9	101.9	13.3		26.4	24.3		36.5	19.5	
Level of Service		B	B	F	B		C	C		D	B	
Approach Delay (s)		13.8			99.3			24.5			19.7	
Approach LOS		B			F			C			B	

Intersection Summary				
HCM 2000 Control Delay	44.3	HCM 2000 Level of Service	D	
HCM 2000 Volume to Capacity ratio	0.80			
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	10.5	
Intersection Capacity Utilization	77.1%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
36: Nave Dr & US 101 NB Off Ramp

07/02/2019

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	724	233	0	1196	915	246
Future Volume (vph)	724	233	0	1196	915	246
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	3.0		5.0	5.0	
Lane Util. Factor	0.97	1.00		0.95	0.95	
Frpb, ped/bikes	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	0.97	
Flt Protected	0.95	1.00		1.00	1.00	
Satd. Flow (prot)	3467	1563		3574	3468	
Flt Permitted	0.95	1.00		1.00	1.00	
Satd. Flow (perm)	3467	1563		3574	3468	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	739	238	0	1220	934	251
RTOR Reduction (vph)	0	36	0	0	35	0
Lane Group Flow (vph)	739	202	0	1220	1150	0
Confl. Peds. (#/hr)		1				
Heavy Vehicles (%)	1%	2%	0%	1%	1%	0%
Turn Type	Prot	Perm		NA	NA	
Protected Phases	4			2	6	
Permitted Phases		4				
Actuated Green, G (s)	31.0	31.0		31.0	31.0	
Effective Green, g (s)	31.0	31.0		31.0	31.0	
Actuated g/C Ratio	0.44	0.44		0.44	0.44	
Clearance Time (s)	3.0	3.0		5.0	5.0	
Vehicle Extension (s)	2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)	1535	692		1582	1535	
v/s Ratio Prot	c0.21			c0.34	0.33	
v/s Ratio Perm		0.13				
v/c Ratio	0.48	0.29		0.77	0.75	
Uniform Delay, d1	13.8	12.5		16.5	16.3	
Progression Factor	1.00	1.00		0.51	1.00	
Incremental Delay, d2	1.1	1.1		2.6	3.4	
Delay (s)	14.9	13.5		11.0	19.7	
Level of Service	B	B		B	B	
Approach Delay (s)	14.6			11.0	19.7	
Approach LOS	B			B	B	

Intersection Summary				
HCM 2000 Control Delay	15.1	HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio	0.63			
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	8.0	
Intersection Capacity Utilization	63.1%	ICU Level of Service	B	
Analysis Period (min)	15			

c Critical Lane Group

Arterial Level of Service
PM Peak Hour Existing plus Project w/ 300 ksf MPA 07/02/2019

Arterial Level of Service: NB #3

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Nave Dr	33	27.1	38.1	0.1	12
Commercial Blvd	34	11.7	25.1	0.1	21
Digital Dr	35	17.8	28.9	0.1	16
Total		56.6	92.0	0.4	16

Arterial Level of Service: WB #3

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Hamilton Dr	35	16.6	28.4	0.1	17
Commercial Blvd	34	10.2	20.7	0.1	23
US 101 NB On Ramp	33	21.4	32.9	0.1	16
Enfrente Rd	32	15.5	28.2	0.1	16
Total		63.7	110.2	0.5	18

Arterial Level of Service
PM Peak Hour Cumulative with Project w/ 300 ksf MPA 07/02/2019

Arterial Level of Service: NB #3

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Nave Dr	33	28.3	38.1	0.1	12
Commercial Blvd	34	12.8	26.4	0.1	20
Digital Dr	35	17.8	28.5	0.1	16
Total		58.9	93.0	0.4	16

Arterial Level of Service: WB #3

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Hamilton Dr	35	15.8	27.1	0.1	18
Commercial Blvd	34	10.4	21.4	0.1	22
US 101 NB On Ramp	33	23.5	34.9	0.1	15
Enfrente Rd	32	17.0	29.2	0.1	16
Total		66.8	112.6	0.5	17

HCS7 Freeway Facilities Report

Project Information

Analyst	W-Trans	Date	7/10/19
Agency		Analysis Year	2016
Jurisdiction	City of Novato	Time Period Analyzed	PM Peak Existing + Project w 300 ksf MPA - Northbound
Project Description	City of Novato General Plan Update EIR	Unit	United States Customary

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	23
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	7.48		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	Novato S City Limits->Alameda del Prado	2000	4
2	Diverge	Basic	Alameda del Prado Off->	1500	4
3	Basic	Basic	Alameda del Prado Off->Alameda del Prado On	2000	3
4	Merge	Merge	Alameda del Prado On->	1000	3
5	Basic	Basic	Alameda del Prado On->Nave Off	2600	3
6	Diverge	Diverge	Nave Off->	1000	3
7	Basic	Basic	Nave Off->Nave On	2000	3
8	Merge	Basic	Nave On->	500	4
9	Merge	Merge	Ignacio On->	1500	4
10	Diverge	Diverge	SR37 Off->	1500	4
11	Diverge	Diverge	Novato Blvd Off->	1500	3
12	Basic	Basic	Novato Blvd Off->SR 37 On	2650	3
13	Weaving	Weaving	SR37->Rowland Blvd	2050	4
14	Basic	Basic	Rowland Blvd Off->Rowland Blvd On	2900	3
15	Merge	Merge	Rowland Blvd On->	1200	3
16	Diverge	Diverge	De Long Off->	1200	3
17	Basic	Basic	De Long Off->De Long On	2000	3
18	Merge	Merge	De Long Ave On->	1200	3
19	Diverge	Diverge	Atherton Ave Off->	1200	3
20	Basic	Basic	Atherton Ave Off->Atherton Ave On	900	3
21	Merge	Merge	Atherton Ave On->	1000	3
22	Merge	Merge	End HOV	1000	3
23	Basic	Basic	End HOV -> Begin 2 lane fwy	5100	2

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	7628	9600	0.83	40.0	47.7	F

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	7408	928	9600	2000	0.83	0.46	28.3	-	65.4	-	F

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	6397	7200	0.98	35.5	60.1	F

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	6704	307	7200	2000	1.02	0.15	61.1	57.9	36.6	34.9	F

Segment 5: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	6704	7200	1.02	58.2	38.4	F

Segment 6: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	1.00	0.957	1.000	6704	947	7200	2000	1.02	0.47	64.2	58.3	34.8	37.8	F

Segment 7: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	5757	7200	0.89	65.8	29.2	D

Segment 8: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	6009	252	9600	2000	0.69	0.13	67.9	-	22.1	-	C

Segment 9: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	7520	1511	9600	2000	0.85	0.76	63.8	58.6	29.5	34.1	D

Segment 10: Diverge

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS

	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	7520	2526	9600	4200	0.85	0.60	66.8	57.9	28.1	23.6	C

Segment 11: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	4994	389	7200	2000	0.78	0.19	65.7	59.9	25.3	32.0	D

Segment 12: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	4586	7200	0.73	72.1	21.2	C

Segment 13: Weaving

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	5246	5634	1.12	63.8	20.6	F

Segment 14: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	3570	7200	0.63	74.9	15.9	B

Segment 15: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	4197	627	7200	2000	0.72	0.31	67.1	64.9	20.8	20.8	C

Segment 16: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	4197	1849	7200	2000	0.72	0.92	60.4	55.6	23.2	27.6	C

Segment 17: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	2348	7200	0.46	74.3	10.4	A

Segment 18: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	2660	312	7200	2000	0.50	0.16	68.8	66.3	12.9	12.7	B

Segment 19: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	0.990	2660	1216	7200	2000	0.50	0.61	61.2	57.5	14.5	18.6	B

Segment 20: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	1444	7200	0.34	72.8	6.4	A

Segment 21: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	2406	962	6761	1878	0.50	0.51	65.8	64.3	12.2	10.2	B

Segment 22: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	2880	474	6761	1878	0.57	0.25	64.7	62.7	14.8	16.6	B

Segment 23: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	2880	3274	1.18	46.7	30.8	F

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	53.8	28.9	27.6	8.30	F

Facility Overall Results

Space Mean Speed, mi/h	53.8	Density, veh/mi/ln	27.6
Average Travel Time, min	8.30	Density, pc/mi/ln	28.9

HCS7 Freeway Facilities Report

Project Information

Analyst	W-Trans	Date	6/8/17
Agency		Analysis Year	2016
Jurisdiction	City of Novato	Time Period Analyzed	PM Peak Existing + Project w 300 ksf MPA - Southbound
Project Description		Unit	United States Customary

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	24
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	6.93		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	N Novato City Limits->San Marin Dr	3200	3
2	Diverge	Diverge	San Marin Dr Off->	1500	3
3	Basic	Basic	San Marin Dr Off->San Marin Dr On	2100	3
4	Merge	Merge	San Marin Dr On->	1175	3
5	Diverge	Diverge	De Long Ave Off->	1175	3
6	Basic	Basic	De Long Ave Off->De Long Ave On	1975	3
7	Merge	Merge	De Long Ave On->	1170	3
8	Diverge	Diverge	BEGIN HOV	200	4
9	Diverge	Diverge	Rowland Blvd Off->	1170	4
10	Basic	Basic	Rowland Blvd Off->Rowland Blvd On	3150	4
11	Merge	Merge	Rowland Blvd On->	1200	4
12	Basic	Basic	Rowland Blvd->SR37-Novato Blvd	770	4
13	Diverge	Diverge	SR37-Novato Blvd Off->	1200	4
14	Basic	Basic	SR37-Novato Blvd Off->SR37-Novato Blvd On	3400	4
15	Merge	Merge	SR37-Novato Blvd On->	1030	5
16	Diverge	Diverge	Ignacio-Enfrente Off->	1000	5
17	Diverge	Basic	BMK-Nave Off->	800	5
18	Basic	Basic	Ignacio Blvd Off->Ignacio Blvd On	1425	4
19	Merge	Merge	Ignacio Blvd On->	1500	4
20	Basic	Basic	Ignacio Blvd->Alameda Del Prado	2250	4
21	Diverge	Diverge	ADP Off->	1500	4
22	Basic	Basic	ADP Off->ADP On	1200	4
23	Merge	Merge	ADP On->	1500	4
24	Basic	Basic	Alameda Del Prado->S Novato City Limits	1000	4

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.957	3619	7200	0.50	74.9	16.1	B

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.957	0.980	3619	423	7200	2000	0.50	0.21	63.9	58.1	18.9	24.4	C

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.954	3209	7200	0.45	74.8	14.2	B

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.960	0.980	4301	1112	7200	2000	0.60	0.56	65.5	62.9	21.9	26.4	C

Segment 5: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.960	0.980	4289	212	7200	2000	0.60	0.11	67.8	62.6	21.1	26.8	C

Segment 6: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.958	4088	7200	0.57	73.8	18.5	C

Segment 7: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.963	0.980	5184	1117	7200	2000	0.72	0.56	64.1	61.2	27.0	30.5	D

Segment 8: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	1.00	0.963	0.990	5169	0	9600	2200	0.54	0.00	71.7	69.8	17.1	25.6	C

Segment 9: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.963	0.980	5169	524	9600	2000	0.54	0.26	70.4	61.7	18.4	25.3	C

Segment 10: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.960	4666	9600	0.49	75.0	15.5	B

Segment 11: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.966	0.980	6064	1427	9600	2000	0.63	0.71	66.3	62.0	22.9	28.6	D

Segment 12: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.966	6041	9600	0.63	72.4	20.9	C

Segment 13: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.966	0.962	6041	677	9600	2100	0.63	0.32	71.0	63.4	21.3	29.3	D

Segment 14: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.967	5382	9600	0.56	74.0	18.2	C

Segment 15: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.966	0.962	6817	1430	12000	4000	0.57	0.36	68.7	65.7	19.8	19.8	B

Segment 16: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.966	0.980	6768	597	12000	2000	0.56	0.30	70.0	61.5	19.3	24.2	C

Segment 17: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.964	0.980	6193	825	12000	2000	0.52	0.41	74.1	-	16.6	-	B

Segment 18: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.962	5392	9600	0.56	73.9	18.2	C

Segment 19: Merge

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS

	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.965	0.980	6466	1091	9600	2000	0.67	0.55	66.4	62.1	24.3	28.4	D

Segment 20: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.965	6449	9600	0.67	71.1	22.7	C

Segment 21: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.932	0.980	6678	347	9600	2000	0.70	0.17	70.5	62.2	23.7	26.9	C

Segment 22: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.931	6331	9600	0.66	71.5	22.1	C

Segment 23: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.934	0.980	7031	721	9600	2000	0.73	0.36	68.0	65.3	25.8	21.1	C

Segment 24: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.934	7043	9600	0.73	68.8	25.6	C

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	70.7	19.9	19.1	5.90	C

Facility Overall Results

Space Mean Speed, mi/h	70.7	Density, veh/mi/ln	19.1
Average Travel Time, min	5.90	Density, pc/mi/ln	19.9

HCS7 Freeway Facilities Report

Project Information

Analyst	W-Trans	Date	7/10/19
Agency		Analysis Year	2016
Jurisdiction	City of Novato	Time Period Analyzed	PM Peak Cumulative with Project w 300 ksf MPA - Northbound
Project Description	City of Novato General Plan Update EIR	Unit	United States Customary

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	23
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	7.48		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	Novato S City Limits->Alameda del Prado	2000	4
2	Diverge	Basic	Alameda del Prado Off->	1500	4
3	Basic	Basic	Alameda del Prado Off->Alameda del Prado On	2000	3
4	Merge	Merge	Alameda del Prado On->	1000	3
5	Basic	Basic	Alameda del Prado On->Nave Off	2600	3
6	Diverge	Diverge	Nave Off->	1000	3
7	Basic	Basic	Nave Off->Nave On	2000	3
8	Merge	Basic	Nave On->	500	4
9	Merge	Merge	Ignacio On->	1500	4
10	Diverge	Diverge	SR37 Off->	1500	4
11	Diverge	Diverge	Novato Blvd Off->	1500	3
12	Basic	Basic	Novato Blvd Off->SR 37 On	2650	3
13	Weaving	Weaving	SR37->Rowland Blvd	2050	4
14	Basic	Basic	Rowland Blvd Off->Rowland Blvd On	2900	3
15	Merge	Merge	Rowland Blvd On->	1200	3
16	Diverge	Diverge	De Long Off->	1200	3
17	Basic	Basic	De Long Off->De Long On	2000	3
18	Merge	Merge	De Long Ave On->	1200	3
19	Diverge	Diverge	Atherton Ave Off->	1200	3
20	Basic	Basic	Atherton Ave Off->Atherton Ave On	900	3
21	Merge	Merge	Atherton Ave On->	1000	3
22	Merge	Merge	End HOV	1000	3
23	Basic	Basic	End HOV -> Begin 2 lane fwy	5100	2

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	7601	9600	0.90	25.3	75.2	F

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	7404	932	9600	2000	0.90	0.47	25.0	-	74.1	-	F

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	6397	7200	1.07	35.2	60.6	F

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	6704	307	7200	2000	1.11	0.15	61.1	57.9	36.6	34.9	F

Segment 5: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	6704	7200	1.11	58.2	38.4	F

Segment 6: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	1.00	0.957	1.000	6704	953	7200	2000	1.11	0.48	64.1	58.2	34.9	37.8	F

Segment 7: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	5751	7200	0.98	65.8	29.1	D

Segment 8: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	6006	255	9600	2000	0.76	0.13	67.9	-	22.1	-	C

Segment 9: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	7537	1531	9600	2000	0.92	0.77	63.8	58.5	29.5	34.3	D

Segment 10: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	7537	2794	9600	4200	0.92	0.67	65.8	57.1	28.6	25.4	C

Segment 11: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	4743	397	7200	2000	0.84	0.20	65.6	59.9	24.1	31.0	D

Segment 12: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	4346	7200	0.78	73.0	19.8	C

Segment 13: Weaving

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	5327	5868	1.14	61.8	21.5	F

Segment 14: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	3607	7200	0.68	74.9	16.1	B

Segment 15: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	4247	640	7200	2000	0.77	0.32	67.1	64.8	21.1	21.0	C

Segment 16: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	4247	1894	7200	2000	0.77	0.95	60.2	55.4	23.5	28.0	C

Segment 17: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	2353	7200	0.51	74.3	10.4	A

Segment 18: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	2677	324	7200	2000	0.55	0.16	68.7	66.3	13.0	12.8	B

Segment 19: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	0.990	2677	1310	7200	2000	0.55	0.66	60.7	57.2	14.7	18.9	B

Segment 20: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	1367	7200	0.37	72.7	6.0	A

Segment 21: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	2344	977	6761	1878	0.54	0.52	65.8	64.3	11.9	9.9	A

Segment 22: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	1.00	0.95	0.957	1.000	3049	868	6761	1878	0.67	0.46	16.5	60.5	61.4	26.0	F

Segment 23: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	1.00	0.957	3049	3274	1.38	42.6	35.8	F

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	47.7	32.7	31.3	9.40	F

Facility Overall Results

Space Mean Speed, mi/h	47.7	Density, veh/mi/ln	31.3
Average Travel Time, min	9.40	Density, pc/mi/ln	32.7

HCS7 Freeway Facilities Report

Project Information

Analyst	W-Trans	Date	7/10/19
Agency		Analysis Year	2016
Jurisdiction	City of Novato	Time Period Analyzed	PM Cumulative with Project w 300 ksf MPA - Southbound
Project Description		Unit	United States Customary

Facility Global Input

Jam Density, pc/mi/ln	190.0	Density at Capacity, pc/mi/ln	45.0
Queue Discharge Capacity Drop, %	7	Total Segments	24
Total Time Periods	1	Time Period Duration, min	15
Facility Length, mi	7.04		

Facility Segment Data

No.	Coded	Analyzed	Name	Length, ft	Lanes
1	Basic	Basic	N Novato City Limits->San Marin Dr	3771	3
2	Diverge	Diverge	San Marin Dr Off->	1500	3
3	Basic	Basic	San Marin Dr Off->San Marin Dr On	2100	3
4	Merge	Merge	San Marin Dr On->	1175	3
5	Diverge	Diverge	De Long Ave Off->	1175	3
6	Basic	Basic	De Long Ave Off->De Long Ave On	1975	3
7	Merge	Merge	De Long Ave On->	1170	3
8	Diverge	Diverge	BEGIN HOV	200	4
9	Diverge	Diverge	Rowland Blvd Off->	1170	4
10	Basic	Basic	Rowland Blvd Off->Rowland Blvd On	3150	4
11	Merge	Merge	Rowland Blvd On->	1200	4
12	Basic	Basic	Rowland Blvd->SR37-Novato Blvd	770	4
13	Diverge	Diverge	SR37-Novato Blvd Off->	1200	4
14	Basic	Basic	SR37-Novato Blvd Off->SR37-Novato Blvd On	3400	4
15	Merge	Merge	SR37-Novato Blvd On->	1030	5
16	Diverge	Diverge	Ignacio-Enfrente Off->	1000	5
17	Diverge	Basic	BMK-Nave Off->	800	5
18	Basic	Basic	Ignacio Blvd Off->Ignacio Blvd On	1425	4
19	Merge	Merge	Ignacio Blvd On->	1500	4
20	Basic	Basic	Ignacio Blvd->Alameda Del Prado	2250	4
21	Diverge	Diverge	ADP Off->	1500	4
22	Basic	Basic	ADP Off->ADP On	1200	4
23	Merge	Merge	ADP On->	1500	4
24	Basic	Basic	Alameda Del Prado->S Novato City Limits	1000	4

Facility Segment Data

Segment 1: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.957	4013	7200	0.56	74.0	18.1	C

Segment 2: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.957	0.980	4013	445	7200	2000	0.56	0.22	63.9	58.0	20.9	26.3	C

Segment 3: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.954	3583	7200	0.50	74.8	15.9	B

Segment 4: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.960	0.980	4740	1179	7200	2000	0.66	0.59	64.8	62.1	24.4	28.6	D

Segment 5: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.960	0.980	4728	222	7200	2000	0.66	0.11	67.8	62.6	23.2	28.9	D

Segment 6: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.958	4517	7200	0.63	72.4	20.8	C

Segment 7: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.963	0.980	5655	1161	7200	2000	0.79	0.58	62.9	59.7	30.0	32.7	D

Segment 8: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	1.00	0.963	0.990	5639	0	9600	2200	0.59	0.00	71.3	69.8	18.7	27.5	C

Segment 9: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.963	0.980	5639	532	9600	2000	0.59	0.27	70.2	61.7	20.1	27.1	C

Segment 10: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.960	5131	9600	0.53	74.4	17.2	B

Segment 11: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.966	0.980	6567	1468	9600	2000	0.68	0.73	65.6	61.1	25.0	30.4	D

Segment 12: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.966	6543	9600	0.68	70.7	23.1	C

Segment 13: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.966	0.962	6543	754	9600	2100	0.68	0.36	70.7	63.2	23.1	31.5	D

Segment 14: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.967	5809	9600	0.61	73.0	19.9	C

Segment 15: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.966	0.962	7397	1582	12000	4000	0.62	0.40	68.1	65.0	21.7	21.5	C

Segment 16: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.966	0.980	7343	613	12000	2000	0.61	0.31	69.9	61.4	21.0	24.8	C

Segment 17: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.964	0.980	6753	839	12000	2000	0.56	0.42	73.9	-	18.3	-	C

Segment 18: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.962	5939	9600	0.62	72.6	20.5	C

Segment 19: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.965	0.980	6986	1066	9600	2000	0.73	0.53	65.8	61.4	26.5	30.0	D

Segment 20: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.965	6969	9600	0.73	69.1	25.2	C

Segment 21: Diverge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.932	0.980	7216	347	9600	2000	0.75	0.17	70.3	62.2	25.7	28.9	D

Segment 22: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.931	6870	9600	0.72	69.5	24.7	C

Segment 23: Merge

Time Period	PHF		fHV		Flow Rate (pc/h)		Capacity (pc/h)		d/c Ratio		Speed (mi/h)		Density (pc/mi/ln)		LOS
	F	R	F	R	Freeway	Ramp	Freeway	Ramp	F	R	F	R	Freeway	Ramp	
1	0.98	0.95	0.934	0.980	7575	727	9600	2000	0.79	0.36	67.3	64.5	28.1	22.8	C

Segment 24: Basic

Time Period	PHF	fHV	Flow Rate (pc/h)	Capacity (pc/h)	d/c Ratio	Speed (mi/h)	Density (pc/mi/ln)	LOS
1	0.98	0.934	7588	9600	0.79	66.2	28.7	D

Facility Time Period Results

T	Speed, mi/h	Density, pc/mi/ln	Density, veh/mi/ln	Travel Time, min	LOS
1	69.9	22.0	21.0	6.00	C

Facility Overall Results

Space Mean Speed, mi/h	69.9	Density, veh/mi/ln	21.0
Average Travel Time, min	6.00	Density, pc/mi/ln	22.0

HCS7 Basic Freeway Report

Project Information

Analyst	W-Trans	Date	7/10/19
Agency		Analysis Year	2017
Jurisdiction	City of Novato	Time Period Analyzed	PM Peak Existing+Project w 300 ksf MPA - Eastbound
Project Description		Unit	United States Customary

Geometric Data

Number of Lanes, ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	0.00
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	75.4
Right-Side Lateral Clearance, ft	6		

Adjustment Factors

Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.968
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	2496	Heavy Vehicle Adjustment Factor (f_{HV})	0.971
Peak Hour Factor	0.95	Flow Rate (V_p), pc/h/ln	1353
Total Trucks, %	3.00	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2323
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.58
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	71.9
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	18.8
Total Ramp Density Adjustment	0.0	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	73.5		

HCS7 Basic Freeway Report

Project Information

Analyst	W-Trans	Date	7/10/19
Agency		Analysis Year	2017
Jurisdiction	City of Novato	Time Period Analyzed	PM Peak Existing+Project - Westbound
Project Description		Unit	United States Customary

Geometric Data

Number of Lanes, ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	0.00
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	75.4
Right-Side Lateral Clearance, ft	6		

Adjustment Factors

Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.968
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	1375	Heavy Vehicle Adjustment Factor (f_{HV})	0.971
Peak Hour Factor	0.95	Flow Rate (V_p), pc/h/ln	746
Total Trucks, %	3.00	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2323
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.32
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	73.5
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	10.1
Total Ramp Density Adjustment	0.0	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	73.5		

HCS7 Basic Freeway Report

Project Information

Analyst	W-Trans	Date	7/10/19
Agency		Analysis Year	2017
Jurisdiction	City of Novato	Time Period Analyzed	PM Peak Cumulative with Project w 300 ksf MPA - Eastbound
Project Description		Unit	United States Customary

Geometric Data

Number of Lanes, ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	0.00
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	75.4
Right-Side Lateral Clearance, ft	6		

Adjustment Factors

Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.968
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	2733	Heavy Vehicle Adjustment Factor (f_{HV})	0.971
Peak Hour Factor	0.95	Flow Rate (V_p), pc/h/ln	1482
Total Trucks, %	3.00	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2323
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.64
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	70.5
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	21.0
Total Ramp Density Adjustment	0.0	Level of Service (LOS)	C
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	73.5		

HCS7 Basic Freeway Report

Project Information

Analyst	W-Trans	Date	7/10/19
Agency		Analysis Year	2017
Jurisdiction	City of Novato	Time Period Analyzed	PM Peak Cumulative with Project w 300 ksf MPA - Westbound
Project Description		Unit	United States Customary

Geometric Data

Number of Lanes, ln	2	Terrain Type	Level
Segment Length (L), ft	-	Percent Grade, %	-
Measured or Base Free-Flow Speed	Base	Grade Length, mi	-
Base Free-Flow Speed (BFFS), mi/h	75.4	Total Ramp Density (TRD), ramps/mi	0.00
Lane Width, ft	12	Free-Flow Speed (FFS), mi/h	75.4
Right-Side Lateral Clearance, ft	6		

Adjustment Factors

Driver Population	Mostly Familiar	Final Speed Adjustment Factor (SAF)	0.975
Weather Type	Non-Severe Weather	Final Capacity Adjustment Factor (CAF)	0.968
Incident Type	No Incident	Demand Adjustment Factor (DAF)	1.000

Demand and Capacity

Demand Volume veh/h	1479	Heavy Vehicle Adjustment Factor (f_{HV})	0.971
Peak Hour Factor	0.95	Flow Rate (V_p), pc/h/ln	802
Total Trucks, %	3.00	Capacity (c), pc/h/ln	2400
Single-Unit Trucks (SUT), %	-	Adjusted Capacity (c_{adj}), pc/h/ln	2323
Tractor-Trailers (TT), %	-	Volume-to-Capacity Ratio (v/c)	0.35
Passenger Car Equivalent (E_T)	2.000		

Speed and Density

Lane Width Adjustment (f_{LW})	0.0	Average Speed (S), mi/h	73.5
Right-Side Lateral Clearance Adj. (f_{RLC})	0.0	Density (D), pc/mi/ln	10.9
Total Ramp Density Adjustment	0.0	Level of Service (LOS)	A
Adjusted Free-Flow Speed (FFS_{adj}), mi/h	73.5		

Appendix F

Native American Consultation Letters

THE CITY OF
NOVATO
CALIFORNIA

922 Machin Ave
Novato, CA 94945
(415) 899-8900
FAX (415) 899-8213
www.novato.org

February 26, 2015

The Federated Indians of the Graton Rancheria
Attn: Nick Tipon
6400 Redwood Drive, Suite 300
Rohnert Park, CA 94928

RE: City of Novato General Plan Update

Dear Mr. Tipon:

Pursuant to the requirements of the California Government Code §65352.3, the Federated Indians of the Graton Rancheria is invited to consult with the City of Novato regarding an update of the City of Novato General Plan. Last adopted in 1996, the General Plan is a comprehensive, long-range plan that identifies Novato's land use, transportation, environmental, economic, fiscal, and social goals and policies as they relate to the conservation and development of land in Novato. The City has initiated a review of the existing policies and programs of the 1996 General Plan, and City staff will be preparing a draft General Plan Update this summer. The City expects to release a public review document in the fall of 2015. You will be noticed during the steps in the process, which will provide a further opportunity for review and comment.

Please indicate, in writing, if the Federated Indians of the Graton Rancheria desires to consult with the City of Novato regarding the proposed general plan update. A request for consultation is encouraged to be sent to the City as soon as possible, but in no case later than ninety (90) days from the date of this letter pursuant to Government Code §65352.3(a)(2).

Should you have any questions regarding the General Plan Update, please feel free to contact Elizabeth Dunn at (415) 493-4711 or edunn@cityofnovato.org.

Sincerely,

Robert M. Brown
Community Development Director

THE CITY OF
NOVATO
CALIFORNIA

922 Machin Avenue
Novato, CA 94945
415/899-8900
FAX 415/899-8213
www.novato.org

August 22, 2016

The Federated Indians of the Graton Rancheria
Attn: Nick Tipon
6400 Redwood Drive, Suite 300
Rohnert Park, CA 94928

RE: City of Novato General Plan Update

Dear Mr. Tipon:

The City of Novato has released a Draft City of Novato General Plan 2035 for public review. The Plan is a comprehensive update of the City's 1996 General Plan. The overall purpose of the Novato General Plan 2035 is to create a policy framework that articulates a vision for the city's long-term physical form and development, while preserving and enhancing the quality of life for Novato residents, and increasing opportunities for high-quality local job growth balanced with robust environmental sustainability principles.

The key components of the General Plan include broad goals for the future of Novato. The State requires that the General Plan contain seven mandatory elements: Land Use, Circulation, Housing, Open Space, Noise, Safety, and Conservation. The Novato General Plan contains these mandatory elements within the six chapters and appendices. Please note that the Housing Element was separately adopted by the City pursuant to a previous public process on November 18, 2014. No amendments to the Housing Element as adopted previously are proposed.

The Draft General Plan 2035 is available online at novato.org/generalplan.

Should you have any questions regarding the Draft City of Novato General Plan 2035, please feel free to contact General Plan Manager Christine O'Rourke at (415) 613-2907. Written comments may be submitted to Christine O'Rourke at corourke@cityofnovato.org. In order to permit time for consideration of comments received prior to the formal public hearing process, comments should be submitted by November 30, 2016.

Sincerely,

Robert M. Brown
Community Development Director

RECEIVED
8/23/16

Rincon Consultants, Inc.
449 15th Street, Suite 303
Oakland, California 94612

510 834 4455 OFFICE AND FAX

info@rinconconsultants.com
www.rinconconsultants.com

November 17, 2016
Project No: 16-02712

Gene Buvelot
6400 Redwood Drive, Suite 300
Rohnert, CA, 94928

Subject: Cultural Resources Study for the Novato General Plan Environmental Impact Report
City of Novato, Marin County, California

Dear Mr. Buvelot:

Rincon Consultants, Inc. (Rincon) has been retained to conduct a cultural resources study for the Novato General Plan Environmental Impact Report (EIR) for the City of Novato, Marin County, California. The EIR will examine the potential environmental effects of the proposed City of Novato 2035 General Plan, which includes various policies directing land use changes, addresses land use compatibility and development intensities, establishes impact thresholds for future development projects, and implements programs focusing on the development of design guidelines and new zoning provisions.

This anticipatory letter serves to inform you of our understanding of the project, and to inquire about your knowledge of potential cultural resources within the City of Novato that may be impacted by project development. A Project Location Map is enclosed with this letter for your reference.

If you have knowledge of cultural resources that may exist within or near the project area, please contact me at (805) 644 4455 extension 165, or at mszromba@rinconconsultants.com. Thank you for your assistance.

Sincerely,

Rincon Consultants, Inc.

Meagan Szromba, M.A., RPA
Associate Archaeologist

Imagery provided by ESRI and its licensors © 2016.

Project Location

N

Steve Marshall

From: Bob Brown
Sent: Monday, November 21, 2016 5:01 PM
To: Christine O'Rourke; Steve Marshall; Veronica Nebb
Subject: FW: City of Novato, General Plan Update
Attachments: City of Novato General Plan Update.pdf

FYI…

Bob Brown
Community Development Director
922 Machin Avenue
Novato, CA 94945
415-899-8938

From: THPO@gratonrancheria.com [mailto:THPO@gratonrancheria.com]
Sent: Monday, November 21, 2016 4:25 PM
To: Bob Brown <bbrown@novato.org>
Subject: City of Novato, General Plan Update

Dear Robert Brown,

Thank you for notifying the Federated Indians of Graton Rancheria regarding City of Novato, General Plan Update, a project within the Tribe's Ancestral Territory. We appreciate being notified and will review your project within 10 business days. If you have an immediate request please contact the Tribal Heritage Preservation Office for assistance by phone at (707) 566-2288 or by email at thpo@gratonrancheria.com.

Sincerely,

Buffy McQuillen
Tribal Heritage Preservation Officer (THPO)
Native American Graves Protection and Repatriation Act (NAGPRA)
Office: 707.566.2288; ext. 137
Cell: 707.318.0485
FAX: 707.566.2291

Antonette Tomic
THPO Administrative Assistant
Federated Indians of Graton Rancheria
6400 Redwood Drive, Suite 300
Rohnert Park, CA 94928
Office: 707.566.2288, ext. 143
Fax: 707.566.2291
atomic@gratonrancheria.com

Steve Marshall

From: Bob Brown
Sent: Tuesday, November 22, 2016 11:47 AM
To: Steve Marshall; Christine O'Rourke; Veronica Nebb
Subject: FW: City of Novato General Plan Update

I'm stunned!

Bob Brown
Community Development Director
922 Machin Avenue
Novato, CA 94945
415-899-8938

From: THPO@gratonrancheria.com [mailto:THPO@gratonrancheria.com]
Sent: Tuesday, November 22, 2016 11:46 AM
To: Bob Brown <bbrown@novato.org>
Subject: City of Novato General Plan Update

Dear Robert Brown,

The Tribe has received the project notification letter dated August 22, 2016, requesting interest and input regarding the project, Cultural Resources Study for the City of Novato General Plan Update. We appreciate your effort to contact the Tribe. The Tribal Heritage Preservation Office staff has reviewed the project information. Based on the project details, the Tribe does not have any comments to provide at this time. Should the project be modified the Tribe respectfully requests project notification and the opportunity to review the project. Thank you for contacting the Tribe with this notice and the opportunity to provide comment.

Sincerely,

Buffy McQuillen
Tribal Heritage Preservation Officer (THPO)
Native American Graves Protection and Repatriation Act (NAGPRA)
Office: 707.566.2288; ext. 137
Cell: 707.318.0485
FAX: 707.566.2291

Antonette Tomic
THPO Administrative Assistant
Federated Indians of Graton Rancheria
6400 Redwood Drive, Suite 300
Rohnert Park, CA 94928
Office: 707.566.2288, ext. 143
Fax: 707.566.2291
atomic@gratonrancheria.com

 **please consider our environment before printing this email.**

Steve Marshall

From: Buffy McQuillen <BMcQuillen@gratonrancheria.com>
To: Steve Marshall
Sent: Monday, December 19, 2016 2:21 PM
Subject: Read: Draft Novato General Plan 2035 - Notice of Preparation of Environmental Impact Report

Your message

To: Buffy McQuillen
Subject: Draft Novato General Plan 2035 - Notice of Preparation of Environmental Impact Report
Sent: Monday, December 19, 2016 2:16:23 PM (UTC-08:00) Pacific Time (US & Canada)

was read on Monday, December 19, 2016 2:20:56 PM (UTC-08:00) Pacific Time (US & Canada).

Hi Buffy,

I am writing to see if we can schedule a consultation call to discuss the draft Novato General Plan 2035. Unlike last time, I have the city's conference call line ready to go.

I noticed the letter requesting consultation seemed to be geared toward a project level review of a new development proposal. Since the General Plan update doesn't go into project level detail or authorize any development projects I am wondering if our conversation can focus on general policy and program statements related to the protection of cultural resources?

With respect to the level of environmental review for the draft General Plan, the City has Rincon Consultants under contract to prepare a program EIR. The program EIR won't attempt to determine the significance of any cultural resources or specific impacts. Rather the EIR will look more broadly at the issue of cultural resources, their presence in Novato, and, if appropriate, provide recommendations for program level mitigations taking the form of policies applicable to future development projects. Since the program EIR is in-process and it is the customary type of EIR for a general plan update, is it possible to forego a discussion about the EIR until the draft document is released for public and agency review?

Please let me know what dates and times you are available for a conference call.

Thanks, Steve

Steve Marshall, AICP
Planning & Environmental Services Manager

City of Novato
Community Development Department
922 Machin Avenue
Novato, CA 94945

Main: (415)899-8989
Direct: (415)899-8942
Fax: (415)899-8216

www.novato.org

THE CITY OF
NOVATO
CALIFORNIA

922 Machin Avenue
Novato, CA 94945
415/899-8900
FAX 415/899-8213
www.novato.org

May 22, 2017

Ms. Buffy McQuillen
Federated Indians of Graton Rancheria
Tribal Heritage Preservation Office
6400 Redwood Drive, Suite 300
Rohnert Park, CA 94928

RE: AB 52 Consultation - Novato General Plan 2035, Novato, Marin County

Dear Buffy:

On April 24, 2017, the City of Novato ("City") received a letter from Federated Indians of Graton Rancheria ("FIGR") indicating a desire to consult with the City regarding the draft Novato General Plan 2035. Based on this request, I sent an email to you on May 2, 2017, seeking to schedule a conference call to consult regarding the draft General Plan. I have not received a response to this email to date.

In the interest of starting consultation on the draft General Plan, I would like to invite you and any other representative of the Graton Rancheria to participate in a conference call regarding the draft General Plan on Tuesday, May 30, 2017, from 11 AM to 12 PM.

I understand you to prefer in-person meetings at FIGR's offices in Rohnert Park. However, I am proposing a conference call since my work load and schedule can't accommodate travel time to and from Rohnert Park. I assume your work load likely doesn't permit travel time to Novato recognizing you are certainly handling many consultation requests from numerous agencies in Marin and Sonoma.

Please let me know if you can participate in the call noted above. If so, I will send call-in information to you. If not, please provide alternative dates and times when you would be available for a consultation call. Please feel free to contact me via email at: smarshall@novato.org

Sincerely,

Steve Marshall

Steve Marshall
Planning Manager

Steve Marshall

From: Buffy McQuillen <BMcQuillen@gratonrancheria.com>
Sent: Friday, June 09, 2017 10:10 AM
To: Steve Marshall
Subject: RE: Draft Novato General Plan 2035 - EIR & Cultural Resources

Hi Steve,
Agree, both our schedules are quite impacted. However, we should give our Tribal Council Members who wish to participate in this meeting with the City the opportunity to meet in person. Given the number of cultural resources in the City it would be great to discuss treatment of TCR's in the General Plan, how consultation will occur on project specific actions, etc. Could June 28th or 30th work for your schedule?

Respectfully,
Buffy McQuillen
Tribal Heritage Preservation Officer (THPO)
Native American Graves Protection and Repatriation Act (NAGPRA)
Federated Indians of Graton Rancheria
6400 Redwood Drive, Suite 300
Rohnert Park, CA 94928
Office: 707.566.2288; ext. 137
Cell: 707.318.0485
FAX: 707.566.2291
bmcquillen@gratonrancheria.com

From: Steve Marshall [mailto:smarshall@novato.org]
Sent: Tuesday, May 02, 2017 3:44 PM
To: Buffy McQuillen <BMcQuillen@gratonrancheria.com>
Subject: Draft Novato General Plan 2035 - EIR & Cultural Resources

Hi Buffy,

I am writing to see if we can schedule a consultation call to discuss the draft Novato General Plan 2035. Unlike last time, I have the city's conference call line ready to go.

I noticed the letter requesting consultation seemed to be geared toward a project level review of a new development proposal. Since the General Plan update doesn't go into project level detail or authorize any development projects I am wondering if our conversation can focus on general policy and program statements related to the protection of cultural resources?

With respect to the level of environmental review for the draft General Plan, the City has Rincon Consultants under contract to prepare a program EIR. The program EIR won't attempt to determine the significance of any cultural resources or specific impacts. Rather the EIR will look more broadly at the issue of cultural resources, their presence in Novato, and, if appropriate, provide recommendations for program level mitigations taking the form of policies

applicable to future development projects. Since the program EIR is in-process and it is the customary type of EIR for a general plan update, is it possible to forego a discussion about the EIR until the draft document is released for public and agency review?

Please let me know what dates and times you are available for a conference call.

Thanks, Steve

Steve Marshall, AICP
Planning & Environmental Services Manager

City of Novato
Community Development Department
922 Machin Avenue
Novato, CA 94945

Main: (415)899-8989
Direct: (415)899-8942
Fax: (415)899-8216

www.novato.org

Appendix G

Mitigation Monitoring and Reporting Program

Mitigation Monitoring and Reporting Program

Public Resources Code Section 21081.6(a)(1) requires that a Lead Agency adopt a Mitigation Monitoring and Reporting Program (MMRP) before approving a project in order to mitigate or avoid significant impacts that have been identified in an Environmental Impact Report (EIR). The purpose of the MMRP is to ensure that the required mitigation measures identified in the EIR are implemented as part of the overall project development process. In addition to ensuring implementation of mitigation measures, the MMRP provides guidance to agency staff and decision-makers during project implementation and identifies the need for enforcement action before irreversible environmental damage occurs. The MMRP must be adopted when the City Council makes a final decision on the project.

The following table summarizes the mitigation measures identified in the Final EIR for the proposed project. Specifically, the table identifies each mitigation measure; the action required for the measure to be implemented; the time at which the monitoring is to occur; the monitoring conditions; and the agency or party responsible for ensuring that the monitoring is performed. Once completed, all monitoring actions will be reported in writing to or by the City, which will maintain mitigation monitoring records for the proposed project.

Mitigation Measure	Action Required	When Monitoring to Occur	Monitoring Frequency	Responsible Agency or Party	Compliance Verification		
					Initial	Date	Comments
Air Quality							
MM AQ-1 Construction Emissions Measures New discretionary projects in the Plan Area that exceed the construction screening criteria of the Bay Area Air Quality Management District (BAAQMD) shall be conditioned to reduce construction emissions of reactive organic gases, nitrogen oxides, and particulate matter (PM_{10} and $PM_{2.5}$) by implementing the BAAQMD's Basic Construction Mitigation Measures (described below) or equivalent, expanded, or modified measures based on project and site specific conditions. Basic Construction Mitigation Measures 1 All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day, with priority given to the use of recycled water for this activity when feasible. 2 All haul trucks transporting soil, sand, or other loose material off-site shall be covered. 3 All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited. 4 All vehicle speeds on unpaved roads shall be limited to 15 mph. 5 All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as	Verify all BAAQMD Basic Construction Mitigation Measures or the equivalent are implemented for all projects that exceed the construction screening criteria.	During project construction	Continuously during project construction	City of Novato Community Development Department and Public Works Department, Developer,– and On-site Construction Manager			

Mitigation Measure	Action Required	When Monitoring to Occur	Monitoring Frequency	Responsible Agency or Party	Compliance Verification		
					Initial	Date	Comments
soon as possible after grading unless seeding or soil binders are used. 6 Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points. 7 All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified visible emissions evaluator. 8 A publicly visible sign shall be posted with the telephone number and person to contact at the lead agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's phone number shall also be visible to ensure compliance with applicable regulations.							
MM AQ-2 Health Risk Assessments Projects that may result in additional toxic air contaminants that are located within 1,000 feet of a sensitive receptors(s) or would place sensitive receptors within 1,000 feet of uses generating toxic air contaminants, such as roadways with volumes of 10,000 average annual daily trips or greater, shall implement Bay Area Air Quality Management District Guidelines and State Office of Environmental Health Hazard Assessment policies and procedures requiring health risk assessments (HRAs) for residential development and other	Verify HRAs are conducted for new stationary sources, new residential development, and other sensitive receptors. If necessary, verify all measures in the HRA, such as air filtration systems, are implemented and included in the	During permitting review of new stationary sources, new residential development and other sensitive receptors, building permit plan check, and during building inspections.	Once during plan review, once during building permit plan check, and once prior to occupancy permits / operation	City of Novato Community Development Department – Planning Division and Building Division			

Mitigation Measure	Action Required	When Monitoring to Occur	Monitoring Frequency	Responsible Agency or Party	Compliance Verification		
					Initial	Date	Comments
sensitive receptors; screening area distances may be increased on a case-by-case basis if an unusually large source or sources of hazardous emissions are proposed or currently exist. Based on the results of the HRA, identify and implement measures (such as air filtration systems) to reduce potential exposure to particulate matter, carbon monoxide, diesel fumes, and other potential health hazards. Measures identified in HRAs shall be included into the site development plan as a component of a proposed project.	development plan and construction plans.						
MM AQ-3 Odor Reduction Require new manufacturing and laboratory development to be designed and constructed in a way that reduces the potential for future odors. Ensure prompt response to complaints about odors reported by residences and businesses by developing a website link that directs users to BAAQMD's odor reporting and inspection program.	Verify new manufacturing and laboratory development has been designed and constructed to reduce odors. Develop a website for odor complaints.	During permitting review and building permit plan check of new manufacturing and laboratory development During project operation	Once during plan review, once during building permit plan check, and once prior to occupancy permits / operation As complaints may be received during operation.	City of Novato Community Development Department – Planning Division, Building Division, and Code Enforcement Division			
Biological Resources							
MM BIO-1 Incorporation of Sensitive Species **Environmental Legacy Goal 1 shall be updated in General Plan 2035 to read:** Preserve, enhance and restore natural areas and features, including Novato's scenic hillsides, waterways, riparian corridors, ~~and~~ baylands, and special-status species.	Verify that the policy has been revised in General Plan 2035.	With approval of General Plan 2035	Once	City of Novato Community Development Department – Planning Division			
MM BIO-2 Biological Studies for New Development Project applicants shall be required to provide a biological resources assessment for projects on parcels with potentially suitable habitat for special status species ~~with indicators of sensitive biological features, such as waterways~~. The biological resources	Verify a biological resources assessment has been prepared for project sites with potential to support special status species.	During project / permitting review	Once at specific project approval. (Note) Once an assessment is completed for a specific project additional monitoring may be required for	City of Novato Community Development Department – Planning Division			

Mitigation Measure	Action Required	When Monitoring to Occur	Monitoring Frequency	Responsible Agency or Party	Compliance Verification		
					Initial	Date	Comments
assessment shall be conducted by a qualified biologist and will include a data review and habitat assessment prior to project activities to identify whether any special-status plant or animal species habitat or sensitive natural communities occur on-site. The data reviewed shall include the biological resources setting, Appendix C species list, and best available, current data for the area, including current review of the California Natural Diversity Database. Habitat assessments shall be completed at an appropriate time of year for identifying potential habitat and no more than one year prior to commencement of project activity. The purpose of these biological resources assessments is to identify appropriate measures to avoid or minimize harm to sensitive biological resources and to incorporate the recommended measures as conditions of approval for the project. Based on the results of the biological resources assessment, the qualified biologist will provide site-specific mitigation measures to avoid special status species or reduce impacts to a less than significant level. ~~Detailed assessments are not necessary in locations where past and existing development have eliminated natural habitat and the potential for the presence of sensitive biological resources~~			the specific project and will be incorporated into project conditions/project specific MMRP as needed.				
MM BIO-3 Biological Resources Inventory for New Development A detailed inventory of biological resources conducted by an independent, professionally qualified biologist, plant ecologist, arborist, or appropriately qualified specialist shall be required for projects in sensitive and vulnerable habitats, as identified in Mitigation Measure BIO-2. If there are seasonal	Verify a biological resources inventory has been completed for project sites in sensitive or vulnerable habitats.	During project / permitting review	Once at specific project approval. (Note) Once an assessment is completed for a specific project additional monitoring may be required for the specific project	City of Novato Community Development Department – Planning Division			

Mitigation Measure	Action Required	When Monitoring to Occur	Monitoring Frequency	Responsible Agency or Party	Compliance Verification		
					Initial	Date	Comments
constraints with performing surveys, presence of such special status species shall be assumed and measures to reduce impacts to special status species and avoidance shall be implemented in accordance with a biological resources assessment and/or project specific California Environmental Quality Act documentation. If sensitive resources are identified on the project site, recommendations to protect the sensitive resources shall conform with applicable State and federal regulations regarding their protection and may include avoidance of the resource, providing setbacks, clustering development onto less sensitive areas, preparing restoration plans, off-site mitigation, and/or other similar measures as determined on a project specific basis.			and will be incorporated into project conditions/project specific MMRP as needed.				
MM BIO-4 Nesting Bird Protection All discretionary projects shall retain the services of a qualified biologist(s) to conduct a pre-construction nesting bird survey during the nesting season (February 1 through August 31) at most 14 days prior to any and all development that may remove trees or vegetation that may provide suitable nesting habitat for migratory birds or other special-status bird species. If nests are found the qualified biologist(s) shall identify and the project sponsor shall implement appropriate avoidance measures, such as fenced buffer areas or staged tree removal periods	Verify nesting bird surveys have been conducted during the nesting season. If necessary, verify avoidance measures have been implemented.	During project / permitting review During project construction if avoidance measures are necessary	Once Periodically during project construction if avoidance measures are necessary	City of Novato Community Development Department – Planning Division, Developer, and On-site Construction Manager			

Mitigation Measure	Action Required	When Monitoring to Occur	Monitoring Frequency	Responsible Agency or Party	Compliance Verification		
					Initial	Date	Comments
MM BIO-5 Wildlife Movement Corridors Protection Policy **The General Plan Environmental Legacy Policy EL 3 shall be updated to read:** Policy EL 3 *Wildlife Habitat.* Endeavor to preserve and enhance wildlife habitat areas and wildlife movement corridors in watercourse areas and control human use of these areas as necessary to protect them.	Verify that the policy has been revised in General Plan 2035.	With approval of General Plan 2035	Once	City of Novato Community Development Department – Planning Division			
MM BIO-6 Biological Studies for Wildlife Movement Corridors All discretionary projects on parcels with indicators of wildlife movement corridors shall retain the services of a qualified biologist(s) to conduct a biological assessment prior to any and all development that may impact wildlife movement. If movement corridors are potentially impacted by the proposed project, the qualified biologist(s) shall identify appropriate mitigation measures to avoid or minimize the impact. Such measures shall be a condition of approval and implemented by the project sponsor.	Verify a biological assessment of wildlife movement corridors has been conducted for projects impacting wildlife corridors. If necessary, verify implementation of avoidance and/or minimization measures.	During project / permitting review Prior to and during project construction	Once Once to confirm pre-construction measures Continuously to ensure construction measures remain in place Once to confirm compliance at project completion/occupancy	City of Novato Community Development Department – Planning Division, Building Division and Public Works – Engineering Inspection. Developer, and On-site Construction Manager			
Cultural Resources							
MM CUL-1 Historical Resources Study Program All discretionary projects shall investigate the potential to impact historical resources. A historical resources evaluation shall be performed to confirm the presence of historical resources within the project site when there is a structure(s) or feature of a type, period, and/or method of construction that could be qualified as having historic status. The study shall, at a minimum, be conducted by a qualified professional meeting the Secretary of the Interior's (SOI) Professional Qualification Standard (PQS) for	Verify a historical resources evaluation has been conducted for projects with potential to impact historical resources. If necessary, verify implementation of avoidance and/or reduction measures.	During project/permitting review Prior to and during project construction	Once Continuously during grading, excavation, and demolition	City of Novato Community Development Department – Planning Division, Building Division and Public Works – Engineering Inspection. Developer, and On-site Construction Manager			

Mitigation Measure	Action Required	When Monitoring to Occur	Monitoring Frequency	Responsible Agency or Party	Compliance Verification		
					Initial	Date	Comments
architectural history (NPS 1983). The study shall include a pedestrian survey of the project site and background research including a records search at the Northwest Information Center (NWIC), building permit research, and/or research with the local historical society(ies). The subject property(ies) shall be evaluated for federal, state, and local designation on California Department of Parks and Recreation 523 series forms, included as an appendix to the study. If historical impacts are identified, the study shall include recommendations to avoid or reduce impacts on historical resources and the project sponsor shall implement the recommendations or conduct additional environmental review.							
MM CUL-2 Archaeological Resources Study Program All discretionary projects shall investigate the potential to disturb archaeological resources. If preliminary reconnaissance suggests that cultural resources may exist, a Phase I cultural resources study shall be performed by a qualified professional meeting the Secretary of the Interior's (SOI) Professional Qualification Standard (PQS) for archaeology (NPS 1983). A Phase I cultural resources study shall include a pedestrian survey of the project site and sufficient background research and, as necessary, field sampling to determine whether archaeological resources may be present. Archival research shall include a records search at the Northwest Information Center (NWIC) and a Sacred Lands File (SLF) search with the Native American Heritage Commission (NAHC), and coordination with Native American tribes listed by the NAHC. The Phase I technical	Verify an archaeological resources evaluation has been completed for applicable projects. If necessary, verify implementation of avoidance and/or reduction measures.	During permitting review Prior to and during project construction	Once Continuously during grading, excavation, and demolition	City of Novato Community Development Department – Planning Division, Building Division and Public Works – Engineering Inspection. Developer, and On-site Construction Manager			

Mitigation Measure	Action Required	When Monitoring to Occur	Monitoring Frequency	Responsible Agency or Party	Compliance Verification		
					Initial	Date	Comments
report documenting the study shall include recommendations to avoid or reduce impacts on archaeological resources. The project sponsor shall implement the recommendations							
MM CUL-3 Paleontological Resources Studies Avoidance and/or mitigation for potential impacts to paleontological resources shall be required for any development in Novato that occurs within high sensitivity geologic units (Pleistocene alluvium [Qpa] and Pleistocene alluvium [Qoa] deposits), whether they are mapped at the surface or occur at the subsurface. When paleontological resources are uncovered during site excavation, grading, or construction activities, work on the site will be suspended until the significance of the fossils can be determined by a qualified paleontologist. If significant resources are determined to exist, the paleontologist shall make recommendations for protection or recovery of the resource. The City shall require the following specific measures for projects that could disturb geologic units with high paleontological sensitivity: **Retain a Qualified Paleontologist to Prepare a PMMP.** Prior to initial ground disturbance, the project applicant shall retain a Qualified Paleontologist, as defined by the SVP (2010), to direct all mitigation measures related to paleontological resources and design a Paleontological Mitigation and Monitoring Program (PMMP) for the project. The PMMP shall include measures for a preconstruction survey, a training program for construction personnel, paleontological monitoring, fossil salvage, curation, and final reporting, as applicable	If necessary, require a qualified paleontologist to prepare a PMMP for a project. Verify implementation of avoidance and/or minimization measures for projects in areas of high sensitivity for geologic units. Verify construction activities are halted if paleontological resources are uncovered until significance can be determined by a qualified paleontologist.	Prior to project construction During project construction During project construction	Once Continuously during project construction As necessary	City of Novato Community Development Department – Planning Division, Building Division and Public Works – Engineering Inspection. Developer, and On-site Construction Manager			

Mitigation Measure	Action Required	When Monitoring to Occur	Monitoring Frequency	Responsible Agency or Party	Compliance Verification		
					Initial	Date	Comments
Geology & Soils							
MM GEO-1 Soil Investigation Report New development projects not connected to the municipal sewer system and requiring the use of septic tanks or alternative wastewater disposal systems shall complete a soil investigation report to be submitted to the City of Novato for review and approval prior to issuance of grading and building permits. The study shall demonstrate the capability of the underlying soils to support the use of septic tanks or alternative wastewater disposal systems. Such report shall be prepared by a registered professional geologist and shall include soil type characteristics, percolation rates, and design recommendations.	Verify a soil investigation report is conducted for projects not connected to the municipal sewer system. Verify implementation of design recommendations, as applicable.	During project / permitting review Prior to project construction At conclusion of construction/occupancy	Once Once Once	City of Novato Community Development Department – Planning Division, Building Division and Public Works – Engineering Inspection. Developer, and On-site Construction Manager			
Noise							
MM N-1 Construction Noise Reduction Measures The following measures to minimize exposure to construction noise shall be included as standard conditions of approval for applicable projects involving construction: 1. *Mufflers*. During excavation and grading construction phases, all construction equipment, fixed or mobile, shall be operated with closed engine doors and shall be equipped with properly operating and maintained mufflers consistent with manufacturers' standards. 2. *Stationary Equipment*. All stationary construction equipment shall be placed so that emitted noise is directed away from the nearest sensitive receptors. 3. *Equipment Staging Areas*. Equipment staging shall be located in areas that will	Verify noise reduction measures are being implemented as a standard condition of approval.	Apply condition at time of permitting. During project construction	Once Continuously during project construction	City of Novato Community Development Department – Planning Division, Building Division and Public Works – Engineering Inspection. Developer, and On-site Construction Manager			

Mitigation Measure	Action Required	When Monitoring to Occur	Monitoring Frequency	Responsible Agency or Party	Compliance Verification		
					Initial	Date	Comments
create the greatest distance feasible between construction-related noise sources and noise-sensitive receptors 4. *Smart Back-up Alarms*. Mobile construction equipment shall have smart back-up alarms that automatically adjust the sound level of the alarm in response to ambient noise levels. Alternatively, back-up alarms shall be disabled and replaced with human spotters to ensure safety when mobile construction equipment is moving in the reverse direction.							
MM N-2 Construction Vibration Reduction Measures The following measures to minimize exposure to construction vibration shall be included as standard conditions of approval for applicable projects involving construction: 1. *Building Examination*. The pre-existing condition of any buildings within 25 feet of any construction activities shall be recorded in order to evaluate damage from project-related construction. Fixtures and finishes within a 25-foot radius of construction activities susceptible to damage will be documented (photographically and in writing) prior to construction. All damage will be repaired back to its pre-existing condition. 2. *Stationary Equipment*. All vibratory stationary construction equipment shall be placed as far as possible from the nearest sensitive receptors. **3.** *Equipment Staging Areas*. Equipment staging shall be located in areas that will create the greatest distance feasible	Verify vibration reduction measures are being implemented as a standard condition of approval.	Apply condition at time of permitting. During project construction	Once Continuously during project construction	City of Novato Community Development Department – Planning Division, Building Division, Public Works – Engineering Inspection. Developer, and On-site Construction Manager			

Mitigation Measure	Action Required	When Monitoring to Occur	Monitoring Frequency	Responsible Agency or Party	Compliance Verification		
					Initial	Date	Comments
between construction-related vibration sources and noise-sensitive receptors.							
Transportation and Traffic							
MM T-1 Intersection Delay Mitigations The following additional intersection improvements are necessary to maintain acceptable operation under Existing plus Project and Cumulative conditions with the proposed project. ▪ San Marin Drive/Simmons Lane (Intersection #1) ▫ Signalize the intersection; restripe both San Marin Drive approaches to include separate left-turn, through, and right-turn lanes. ▫ Alternative Mitigation: install a roundabout; the westbound approach would have two lanes, one serving through/right movements and one serving left-turn movements, and the remaining three approaches would have single lanes. ▫ The alternative roundabout mitigation may require minor right-of-way acquisitions on one or more intersection corners. ▪ Redwood Boulevard/San Marin Drive (Intersection #4) ▫ Widen the SMART railroad overpass to provide space on the westbound approach for two left-turn lanes, two through lanes, and one right-turn lane, as well as bike lanes and a widened sidewalk on the south side of the overpass. ▫ Widen the southbound Redwood Boulevard approach to include a left-	Conduct level of service (LOS) studies, as warranted, when new discretionary development proposals are presented to the City.	During project permitting through conditions of approval	As warranted depending on implementing condition	City of Novato Community Development Department – Planning Division and Public Works Department			

Mitigation Measure	Action Required	When Monitoring to Occur	Monitoring Frequency	Responsible Agency or Party	Compliance Verification		
					Initial	Date	Comments
turn lane, shared left-turn/through lane, and right-turn lane. ▫ Restripe the northbound Redwood Boulevard to include a left-turn lane, left-turn/through lane, and two right-turn lanes. ▫ Add right-turn overlap signal phasing on the northbound and westbound approaches. ▫ This mitigation would entail roadway and overpass widening that could require right-of-way acquisition. ▫ To make this intersection function acceptably, additional improvements would be needed at the US 101 South Ramps/San Marin Drive intersection, as described in the next bullet. ▪ US 101 South Ramps/San Marin Drive (Intersection #5) ▫ Modify the eastbound San Marin Drive approach (the SMART railroad overpass) to include a through lane, a shared through/right-turn lane, and a right-turn lane. ▫ Provide an enhanced bicycle-pedestrian crossing at the on-ramp entrance, including modified signal phasing to include protected pedestrian and bicyclist movements across the ramp. ▫ This mitigation would entail roadway and overpass widening that could require right-of-way acquisition, and potentially affect areas that appear to be wetlands between the SMART rail corridor and the off-ramp. ▪ US 101 North Ramps/Atherton Avenue (Intersection #6)							

Mitigation Measure	Action Required	When Monitoring to Occur	Monitoring Frequency	Responsible Agency or Party	Compliance Verification		
					Initial	Date	Comments
▫ Widen the northbound off-ramp to include two left-turn lanes and a shared through/right-turn lane. ▪ Novato Boulevard/San Marin Drive-Sutro Avenue (Intersection #9) ▫ Signalize the intersection. ▫ Alternative Mitigation: install a single-lane roundabout with a southbound right-turn "slip" lane. ▫ The alternative roundabout mitigation may require minor right-of-way acquisition on one or more intersection corners. ▪ Diablo Avenue/Novato Boulevard (Intersection #14) ▫ Restripe the eastbound and westbound Diablo Avenue approaches to include separate left-turn, through, and right-turn lanes. ▫ Restripe the northbound Novato Boulevard Approach to include a left-turn lane, through lane, and through/right-turn lane. ▫ Widen and modify southbound Novato Boulevard to include dual left-turn lanes and a shared through/right-turn lane. ▫ Modify the signal phasing to protected left-turns on all approaches plus a westbound right-turn overlap phase. ▫ The mitigation may require minor right-of-way acquisition on Novato Boulevard to the northwest of the intersection. ▪ South Novato Boulevard/Redwood Boulevard (Intersection #30) ▫ Signalize the intersection.							

Mitigation Measure	Action Required	When Monitoring to Occur	Monitoring Frequency	Responsible Agency or Party	Compliance Verification		
					Initial	Date	Comments
▫ Alternative Mitigation: install a single-lane roundabout with an eastbound right-turn "slip" lane. ▫ The alternative roundabout mitigation may require minor right-of-way acquisition on one or more intersection corners. ▪ US 101 South Ramps/Ignacio Boulevard-Enfrente Road (Intersection #32) ▫ On the southbound US 101 "loop" off-ramp, extend the length of the dual right-turn pockets to 500 feet. ▫ Optimize signal timing on the coordinated Ignacio Boulevard-Bel Marin Keys Boulevard corridor. ▪ Bel Marin Keys Boulevard/Digital Drive (Intersection #35) ▫ Restripe the westbound approach to include a left-turn lane and a left-turn/through/right-turn lane, and modify the signal to operate with split phasing in the eastbound and westbound directions.							
Tribal Cultural Resources							
MM TCR-1 Tribal Cultural Resources The following policy shall be added to Community Character Goal 1 in General Plan 2035: **Tribal Cultural Resources Protection**. The City shall comply with AB 52, which may require formal tribal consultation on a project-by-project basis.	Verify that the policy has been added to General Plan 2035.	With approval of General Plan 2035	Once	City of Novato Community Development Department – Planning Division			

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