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Lance Drive Project

Environmental Checklist

Pursuant to CEQA Guidelines

Section 15168 and Section 15182



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Acronyms and Abbreviations

AB	Assembly Bill
ADA	Americans with Disabilities Act
afy	acre-feet per year
ASTM	American Society for Testing and Materials
BAAQMD	Bay Area Air Quality Management District
BERs	business environmental risks
BMPs	best management practices
CALGreen	California Green Building Standards Code
Caltrans	California Department of Transportation
CAP	Climate Action Plan
CCP	Cities for Climate Protection
CEQA	California Environmental Quality Act
City	City of Santa Rosa
CN combining district	Neighborhood Commercial combining district
CRHR	California Register of Historical Resources
EIR	environmental impact report
EV	electric vehicle
EVCS	electric-vehicle charging station
General Plan	Santa Rosa General Plan 2035
GHG	greenhouse gas
GIS	geographic information system
gpd	gallons per day
HVAC	heating, ventilation, and air-conditioning
ICLEI	International Council on Local Environmental Initiatives
LAFCo	Local Agency Formation Commission
LID	low-impact development
LOS	Level of service
North Station Area Plan	North Santa Rosa Station Area Specific Plan
North Station Area Plan EIR	North Santa Rosa Station Area Specific Plan Environmental Impact Report
NRHP	National Register of Historic Places
PDA	Priority Development Area
PG&E	Pacific Gas and Electric
Phase I ESA	Phase I Environmental Site Assessment
planning area	planning area for the North Santa Rosa Station Area Specific Plan
PM _{2.5}	particulate with a diameter of 2.5 micrometers or less

project sponsor	Pacific Development
proposed project	Lance Drive Project
PV	photovoltaic
RCPA	Regional Climate Protection Authority
RECs	recognized environmental conditions
SA combining district	Station Area combining district
SB	Senate Bill
SMART	Sonoma-Marin Area Rail Transit
SOI	sphere of influence
SRCS	Santa Rosa City Schools District
SRFD	Santa Rosa Fire Department
SRPD	Santa Rosa Police Department
TACs	toxic air contaminants
TDM	transportation demand management
TPA	Transit Priority Area
UGB	urban growth boundary
USTs	underground storage tanks
VMT	vehicle miles traveled
WSA	water supply assessment

The proposed Lance Drive Project (proposed project) includes the demolition of existing single-family residential units and associated structures as well as the phased construction of up to 772 dwelling units, consisting of 672 apartments and 100 single-family residences. The approximately 34.9-acre project site comprises five parcels at 1601 Lance Drive, 1680 Lance Drive, 1696 Lance Drive, 1705 Lance Drive, and 0 Lance Drive in an unincorporated area of southeastern Sonoma County.

1.1 Previously Certified EIR

The project site is within the planning area for the North Santa Rosa Station Area Specific Plan (North Station Area Plan), which was adopted by the City of Santa Rosa (City) on September 18, 2012, to support future rail transit by increasing the number of residents and employees within walking distance of the North Santa Rosa Sonoma-Marin Area Rail Transit (SMART) Station by improving pedestrian, bicycle, auto, and transit connections, increasing residential density, promoting economic development, and enhancing aesthetics and quality of life. The City prepared a program environmental impact report (EIR) pursuant to CEQA Guidelines Section 15168 for the North Station Area Plan, which was certified by the Santa Rosa City Council on September 18, 2012. The North Santa Rosa Station Area Specific Plan EIR (North Station Area Plan EIR) (State Clearinghouse No. 2011122034) evaluated the physical environmental effects of development pursuant to implementation or buildout of the North Station Area Plan. Chapter 3, *Relevant City Planning Documents*, provides more details regarding the North Station Area Plan and its certified EIR.

1.2 CEQA Review of the Project

Documentation herein for the proposed project has been prepared by the City as lead agency in full accordance with the procedural and substantive requirements of the California Environmental Quality Act (CEQA), CEQA Guidelines, and the City of Santa Rosa's Environmental Review Guidelines. This checklist uses CEQA Guidelines Section 15182 implementing California Government Code Section 65457, which provides for an exemption for certain residential, commercial, and mixed-use projects that are consistent with an adopted specific plan for which an EIR was certified. In addition, this checklist uses CEQA Guidelines Section 15168, which specifies that program EIRs can be used for later activities, provided that those later activities are examined in the light of the program EIR to determine whether an additional environmental document must be prepared. The analysis provided herein relies on the North Station Area Plan and its certified EIR.

Pursuant to a determination of compliance with CEQA Guidelines Section 15182, the City must determine if there are changes to the development of the proposed project as anticipated by the North Station Area Plan, substantial changes in circumstances, or new information of substantial importance subsequent to the approval of the North Station Area Plan EIR that warrant preparation of an addendum to the EIR pursuant to CEQA Guidelines Section 15164 (*Addendum to an EIR or Negative Declaration*) or preparation of a subsequent or supplemental EIR pursuant to CEQA Guidelines Section 15162 (*Subsequent EIRs and Negative Declarations*).

There are no proposed changes or revisions to the North Station Area Plan under the proposed project. Consequently, the primary impetus for the City's review is the question of whether the proposed project could result in substantial changes in circumstances or new information of substantial importance that result in new or more substantially more severe significant effects or new feasible mitigation measures or alternatives (CEQA Guidelines Section 15162).

The relevant CEQA Guidelines are provided below. Chapter 5, *Applicable CEQA Provisions and Findings*, describes how the proposed project complies with the relevant provisions of CEQA.

1.2.1 California Government Code Section 65457 and CEQA Guidelines Section 15182

Government Code Section 65457 as implemented under CEQA Guidelines Section 15182 provides a statutory exemption for projects that are consistent with an adopted specific plan for which an EIR was certified.

California Government Code Section 65457 contained in Title 7, Division 1, Chapter 3, Article 8 provides a statutory exemption from CEQA for projects as follows:

- (a) Any residential development project, including any subdivision, or any zone change that is undertaken to implement and is consistent with a specific plan for which an environmental impact report has been certified after January 1, 1980, is exempt from the requirements of Division 13 (commencing with Section 21000) of the Public Resources Code. However, if after the adoption of the specific plan, an event as specified in Section 21166 of the Public Resources Code occurs, the exemption does not apply unless and until a supplemental environmental impact report for the specific plan is prepared and certified in accordance with the provisions of CEQA. After a supplemental environmental impact report is certified, the exemption specific in this subdivision applies to projects undertaken pursuant to the specific plan.
- (b) An action or proceeding alleging that a public agency has approved a project pursuant to a specific plan without having previously certified a supplemental environmental impact report for the specific plan, where required by subdivision (a), shall be commenced within 30 days of the public agency's decision to carry out or approve the project.

Public Resources Code Section 21166 provides that "[w]hen an environmental impact report has been prepared for a project pursuant to this division, no subsequent or supplemental environmental impact report shall be required by the lead agency or by any responsible agency, unless one or more of the following events occurs:

- (a) Substantial changes are proposed in the project which will require major revisions of the environmental impact report.
- (b) Substantial changes occur with respect to the circumstances under which the project is being undertaken which will require major revisions in the environmental impact report.
- (c) New information, which was not known and could not have been known at the time the environmental impact report was certified as complete, becomes available."

CEQA Guidelines Section 15182 provides the following guidance:

- (a) General. Certain residential, commercial and mixed-use projects that are consistent with a specific plan adopted pursuant to Title 7, Division 1, Chapter 3, Article 8 of the Government Code are exempt from CEQA, as described in subdivisions (b) and (c) of this section.
- (b) Projects Proximate to Transit.
 - (1) Eligibility. A residential or mixed-use project, or a project with a floor area ratio of at least 0.75 on commercially-zoned property, including any required subdivision or zoning approvals, is exempt if the project satisfies the following criteria:
 - (A) It is located within a transit priority area as defined in Public Resources Code section 21099(a)(7);
 - (B) It is consistent with a specific plan for which an environmental impact report was certified; and
 - (C) It is consistent with the general use designation, density, building intensity, and applicable policies specified for the project area in either a sustainable communities strategy or an alternative planning strategy for which the State Air Resources Board has accepted the determination that the sustainable communities strategy or the alternative planning strategy would achieve the applicable greenhouse gas emissions reduction targets.
 - (2) Limitation. Additional environmental review shall not be required for a project described in this subdivision unless one of the events in section 15162 occurs with respect to that project.
 - (3) Statute of Limitations. A challenge to a project described in this subdivision is subject to the statute of limitations periods described in section 15112.
- (c) Residential Projects Implementing Specific Plans.
 - (1) Eligibility. Where a public agency has prepared an EIR on a specific plan after January 1, 1980, a residential project undertaken pursuant to and in conformity to that specific plan is exempt from CEQA if the project meets the requirements of this section. Residential projects covered by this section include but are not limited to land subdivisions, zoning changes, and residential planned unit developments.
 - (2) Limitation. If after the adoption of the specific plan, an event described in Section 15162 occurs, the exemption in this subdivision shall not apply until the city or county which adopted the specific plan completes a subsequent EIR or a supplement to an EIR on the specific plan. The exemption provided by this section shall again be available to residential projects after the Lead Agency has filed a Notice of Determination on the specific plan as reconsidered by the subsequent EIR or supplement to the EIR.
 - (3) Statute of Limitations. A court action challenging the approval of a project under this subdivision for failure to prepare a supplemental EIR shall be commenced within 30 days after the lead agency's decision to carry out or approve the project in accordance with the specific plan.
- (d) Fees. The Lead Agency has authority to charge fees to applicants for projects which benefit from this section. The fees shall be calculated in the aggregate to defray but not to exceed the cost of developing and adopting the specific plan including the cost of preparing the EIR.

1.2.2 CEQA Guidelines Section 15168

CEQA Guidelines Section 15168(c) specifies that a program EIR can be used for later activities. Later activities in the program must be examined in the light of the program EIR to determine whether an additional environmental document must be prepared.

CEQA Guidelines Section 15168(c) provides the following guidance:

- (c) Use with Later Activities. Later activities in the program must be examined in the light of the program EIR to determine whether an additional environmental document must be prepared.
 - (1) If a later activity would have effects that were not examined in the program EIR, a new Initial Study would need to be prepared leading to either an EIR or a Negative Declaration. That later analysis may tier from the program EIR as provided in Section 15152.
 - (2) If the agency finds that pursuant to Section 15162, no subsequent EIR would be required, the agency can approve the activity as being within the scope of the project covered by the program EIR, and no new environmental document would be required. Whether a later activity is within the scope of a program EIR is a factual question that the lead agency determines based on substantial evidence in the record. Factors that an agency may consider in making that determination include, but are not limited to, consistency of the later activity with the type of allowable land use, overall planned density and building intensity, geographic area analyzed for environmental impacts, and covered infrastructure, as described in the program EIR.
 - (3) An agency shall incorporate feasible mitigation measures and alternatives developed in the program EIR into later activities in the program.
 - (4) Where the later activities involve site specific operations, the agency should use a written checklist or similar device to document the evaluation of the site and the activity to determine whether the environmental effects of the operation were within the scope of the program EIR.
 - (5) A program EIR will be most helpful in dealing with later activities if it provides a description of planned activities that would implement the program and deals with the effects of the program as specifically and comprehensively as possible. With a good and detailed project description and analysis of the program, many later activities could be found to be within the scope of the project described in the program EIR, and no further environmental documents would be required.

1.2.2.1 CEQA Guidelines Section 15162

CEQA Guidelines Section 15162, referenced in Section 15168(c) above, provides the following guidance:

- (a) When an EIR has been certified or a negative declaration adopted for a project, no subsequent EIR shall be prepared for that project unless the lead agency determines, on the basis of substantial evidence in the light of the whole record, one or more of the following:
 - (1) Substantial changes are proposed in the project which will require major revisions of the previous EIR or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects;
 - (2) Substantial changes occur with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR or Negative Declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; or

- (3) New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was certified as complete or the Negative Declaration was adopted, shows any of the following:
- (A) The project will have one or more significant effects not discussed in the previous EIR or negative declaration;
 - (B) Significant effects previously examined will be substantially more severe than shown in the previous EIR;
 - (C) Mitigation measures or alternatives previously found not to be feasible would in fact be feasible, and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or
 - (D) Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.
- (b) If changes to a project or its circumstances occur or new information becomes available after adoption of a negative declaration, the lead agency shall prepare a subsequent EIR if required under subdivision (a). Otherwise the lead agency shall determine whether to prepare a subsequent negative declaration, an addendum, or no further documentation.

1.3 Public Review Process

The proposed project has been analyzed pursuant to CEQA Guidelines Section 15182 implementing California Government Code Section 65457 as well as CEQA Guidelines Section 15162 and does not require circulation for public review and comment. Nonetheless, the City will make this checklist available to the public as part of the public hearing process, which requires approval through the City's Modified Design Review permitting procedure.

1.4 Incorporation by Reference

CEQA allows incorporation of other public documents by reference. This checklist incorporates by reference information or analysis from the North Station Area Plan EIR. As required in CEQA Guidelines Section 15150, where information from the North Station Area Plan EIR is incorporated into this checklist, the incorporated information is briefly summarized or described.

The North Station Area Plan and its certified EIR are available to the public at the Planning and Economic Development Department, 100 Santa Rosa Avenue, Room 3, Santa Rosa, California 95404, during normal business hours and online at <https://www.srcity.org/425/Plans-Studies-EIRs>.

1.5 Environmental Checklist Organization

This checklist is organized in the following chapters and appendices:

- Chapter 1, *Introduction*, includes a brief overview of the project, the relevant provisions of CEQA, the public review process, and the organization of the checklist.

- Chapter 2, *Project Description*, includes an overview of the project, a description of the project location and physical setting, a description of the existing conditions at the project site, a list of the project objectives, a detailed description of the project components and project construction, and a list of the required permits and approvals.
- Chapter 3, *Relevant City Planning Documents*, includes a description of the most relevant planning documents that are applicable to the proposed project.
- Chapter 4, *Consistency Analysis & Environmental Checklist*, includes a discussion of the proposed project's consistency with applicable North Station Area Plan goals and policies identified in the North Station Area Plan EIR that reduce environmental impacts. Each resource-specific section in this chapter briefly summarizes the conclusions of the North Station Area Plan EIR, presents the potential impacts of the project relative to the impacts of the implementation of the North Station Area Plan, and identifies relevant mitigation measures from the North Station Area Plan EIR applicable to the proposed project.
- Chapter 5, *Applicable CEQA Provisions and Findings*, describes how the provisions of CEQA that are applicable to the proposed project. This chapter concludes with the CEQA finding and determination that the proposed project is exempt from further CEQA review.
- Chapter 6, *Environmental Conditions of Approval*, identifies applicable mitigation measures to be imposed on the proposed project as environmental conditions of approval.
- Chapter 7, *Report Preparation*, includes a list of people who reviewed and prepared the checklist and supporting materials for the project.
- Appendices
 - A Supporting Materials for the Air Quality Analysis
 - B Supporting Materials for the Built Environment Analysis
 - C Transportation Impact Analysis

2.1 Project Overview

Pacific Development (project sponsor) is proposing the Lance Drive Project (proposed project), which includes the demolition of existing single-family residential units and associated structures as well as the phased construction of up to 772 dwelling units, consisting of 672 apartments and 100 single-family residences. In addition, the proposed project would include approximately 5,000 square feet of retail uses, two residential clubhouses (approximately 6,500 square feet each), and two ancillary support buildings (approximately 1,000 square feet each) to support the associated activities. In total, the proposed project would consist of approximately 900,600 square feet of new uses. In addition, approximately 1,491 parking spaces would be provided. The project site is in an unincorporated area of Sonoma County. The project site would be annexed to the City of Santa Rosa (City) as part of the proposed project.

Figures 2-1 through 2-5 are included at the end of this chapter.

2.2 Project Location and Physical Setting

The approximately 34.9-acre project site comprises five parcels at 1601 Lance Drive, 1680 Lance Drive, 1696 Lance Drive, 1705 Lance Drive, and 0 Lance Drive in an unincorporated area of southeastern Sonoma County (Figure 2-1). The project site is an unincorporated county island (i.e., the site is surrounded by city land within the City of Santa Rosa's urban growth boundary [UGB] and sphere of influence [SOI]).¹ The project site includes the following five assessor's parcel numbers 036-111-002, 009, -010, -011, and -016.

The project site includes two single-family homes and associated structures but is primarily undeveloped pastureland (Figure 2-2). Approximately six people currently reside on the project site; there are no existing employees on the project site.

Access to the project site is provided via Iroquois Street, Lance Drive, and Guerneville Road. The topography of the project site is relatively flat, with an overall slope ranging from 0.5 to 1 percent. There are 159 existing trees on the project site. Of these, 30 are heritage trees. Existing on-site landscaping also includes shrubs and grasses. Approximately 99 percent of the project site is covered with pervious surfaces, and 1 percent is covered with impervious surfaces.

Surrounding land uses include single-family and multi-family residential development to the north, east, and south. Hillard Comstock Middle School is adjacent to the northwest corner of the project site, and Crosspoint Community Church and a Pacific Gas and Electric (PG&E) substation are adjacent to the southwest corner of the site. The project site is approximately 0.2 mile northwest of the Santa Rosa North Sonoma-Marin Area Rail Transit (SMART) station and 0.8 mile east of U.S. 101. Existing Class II bicycle facilities are located along Guerneville Road.

¹ County areas that are surrounded by or adjacent to city land are often referred to as unincorporated county islands.

2.3 Existing Site Conditions

2.3.1 General Plan Land Use Designations and Zoning Districts

Sonoma County is organized into nine sub-county planning areas. The project site is in Planning Area 5, Santa Rosa and Environs. This area of Sonoma County is characterized by flat terrain, small valleys surrounded by rolling hills, rural residential development, and unincorporated islands. The project site is assigned a Rural Residential land use designation by the Sonoma County General Plan. This land use designation permits a maximum density of one dwelling unit per 5 acres and is typically assigned to unincorporated islands.²

The project site is in the City of Santa Rosa's UGB and SOI. The UGB comprises approximately 45 square miles and encompasses all incorporated land as well as unincorporated land that will eventually be annexed and served by the City. As part of the entitlement process, the project site would be annexed to the City. Refer to Section 2.7, *Required Permits and Approvals*, for a discussion of the required permits and approvals for the proposed project.

Consistent with Section 56652 of the Cortese-Knox-Herzberg Local Government Reorganization Act of 2000, the City adopted pre-zoning districts that would apply to the project site upon annexation (Figure 2-3).³ The pre-zoning districts adopted for the project site include Multi-Family Residential (R-3)—specifically, R-3-18 and R-3-30. The R-3 zoning district is applied to areas appropriate for residential neighborhoods with medium to high residential densities. The allowable density for the project site ranges from one unit per 1,450 square feet (R-3-30) to one unit per 2,400 square feet (R-3-18).⁴ The portion of the project site on the corner of Guerneville Road and Lance Drive is pre-zoned Neighborhood Commercial (CN). The CN zoning district is applied to areas within and adjacent to residential neighborhoods and appropriate for limited retail and business services (e.g., for convenience shopping). Most of the project site is in the North Station Area (SA) combining district, which is applied to areas within the North Santa Rosa Station Area Specific Plan boundary.

The project site is assigned Medium-Density Residential, Medium High-Density Residential, and Retail and Business Services land use designations in the City of Santa Rosa General Plan 2035 (Figure 2-4).⁵ The Medium-Density Residential land use designation permits a range of housing types, including single-family attached housing and multi-family developments, with a maximum density of 18 units per acre. The Medium High-Density Residential land use designation permits a similar range of housing types, with a maximum density of 30 units per acre. The Retail and Business Services land use designation permits retail and service enterprises, offices, and restaurants.

² Sonoma County. 2008. *Sonoma County General Plan 2020, Land Use Element*. September 23. Available: <https://s3.documentcloud.org/documents/4277683/Sonoma-County-General-Plan-2020-Land-Use-Element.pdf>. Accessed: September 14, 2023.

³ Governor's Office of Planning and Research. 2012. *LAFCOs, General Plans, and City Annexations*. February 7. Available: https://www.sbcounty.gov/uploads/lafco/items/201205/item_11_supplemental.pdf. Accessed: September 14, 2023.

⁴ The specific allowable density for the R-3 zoning district is denoted by a numerical suffix to the R-3 map symbol. In this case, R-3-18 and R-3-30.

⁵ City of Santa Rosa. 2020. *General Plan Land Use Diagram*. December 8. Available: <https://www.srcity.org/DocumentCenter/View/3094/General-Plan-Land-Use-Diagram-PDF-December-2021>. Accessed: September 14, 2023.

2.3.2 North Santa Rosa Station Area Specific Plan

The project site is within the planning area for the North Santa Rosa Station Area Specific Plan (North Station Area Plan). The North Station Area Plan and its certified EIR are discussed in Section 3.2, *North Santa Rosa Station Area Specific Plan*, in Chapter 3, *Relevant City Planning Documents*.

2.4 Project Objectives

The City of Santa Rosa and Sonoma County Local Agency Formation Commission (LAFCo), in collaboration with the project sponsor, identified the following objectives to guide development of the proposed project:

- Develop a new mixed-use community with a variety of home configurations, residential amenities, and commercial retail uses.
- Meet the City's residential density goals for the site, and help the City address the local housing shortage and meet its Regional Housing Needs Allocation (RHNA) targets.
- Provide much-needed affordable housing consistent with the City's affordable housing requirements.
- Generate new property tax and sales tax revenues for the City.
- Provide new employment opportunities for City residents.
- Annex the site into the City and eliminate an existing Sonoma County island, to promote integrated land use planning and development patterns.
- Provide a high-quality project design consistent with the City's design standards.
- Minimize negative impacts on the City's existing residential neighborhoods.
- Create an efficient on-site circulation plan with an interconnected network of pedestrian pathways, open space areas, and amenities to serve residents and their guests.
- Incorporate development standards that configure building frontages along public streets and locate on-site parking in the interior of the community.

2.5 Project Components

The proposed project includes the demolition of existing single-family residential units and associated structures as well as the phased construction of up to 772 dwelling units, consisting of 672 apartments and 100 single-family residences. In addition, the proposed project would include approximately 5,000 square feet of retail uses, two residential clubhouses (approximately 6,500 square feet each), and two ancillary support buildings (approximately 1,000 square feet each) to support the associated activities. The proposed apartments would include approximately 480 one-bedroom units, 352 two-bedroom units, and 72 three-bedroom units. In total, the proposed project would consist of approximately 900,600 square feet of new uses. In compliance with the City's inclusionary housing ordinance, the proposed project would include either 8 percent of the total number of new dwelling units as affordable to low-income households or at least 5 percent

of the total number of new dwelling units as affordable to very low income households. The proposed project would have an overall residential density of approximately 22.5 dwelling units per acre. The maximum building height would be three stories, or approximately 40 feet tall.⁶

As shown in the conceptual site plan (Figure 2-5), the proposed project would be constructed in three phases:

- **Phase 1:** Phase 1 would be located on the south side of the project site. It would include the demolition of residential units and associated structures as well as the construction of up to 396 apartments, one residential clubhouse, one ancillary support building, and retail uses. The proposed retail uses would be located on the corner of Guerneville Road and Lance Drive. In total, Phase 1 would include the construction of approximately 417,800 square feet of new uses.
- **Phase 2:** Phase 2 would be located on the north side of the project site. It would include the construction of up to 100 single-family residences. In total, Phase 2 would include the construction of approximately 192,000 square feet of new uses.
- **Phase 3:** Phase 3 would be located on the west side of the project site. It would include the construction of up to 276 apartments, one residential clubhouse, and one ancillary support building. In total, Phase 3 would include the construction of approximately 290,800 square feet of new uses.

The proposed on-site amenities would include common and private open space areas, swimming pools, pet parks, courtyards, a network of interconnected walkable paseos (or pathways), and communal landscaped amenity areas. In addition, a plaza (including a community garden) would be located on the corner of Guerneville Road and Lance Drive. The approximately 0.3-acre community garden would serve residents and the surrounding community; in addition to providing gardening space, it would be used as an educational space and gathering area. The project would include several residential amenity areas throughout the project site that would vary in size from approximately 0.3 acre to approximately 1 acre; some of the amenity areas would be centered around clubhouse or pavilion structures.

A total of approximately 1,961 residents⁷ would reside at the project site, and approximately 32 employees⁸ would work at the project site upon completion and occupancy of the new buildings. Residents and employees would most likely be drawn from the Santa Rosa area.

Upon project completion, approximately 23 percent of the project site would be covered with pervious surfaces, and 77 percent of the project site would be covered with impervious surfaces.

The proposed project would not include any emergency generators.

2.5.1 Site Access, Circulation, and Parking

As depicted in Figure 2-5, vehicular access to the project site would be provided via one driveway along Guerneville Road, two driveways along Lance Drive, and three driveways along Iroquois Street. The proposed internal roads would be configured in a loop pattern, providing access to the proposed buildings, parking, and on-site amenities.

⁶ The building height is measured to the top of rooftop appurtenances.

⁷ Based on 2.54 persons per household used in the Santa Rosa North Santa Rosa Station Area Specific Plan EIR.

⁸ Based on one leasing office employee per 350 residential units, one maintenance person per 100 residential units, one additional employee during the initial leasing period, and four retail employees per 1,000 square feet of retail space.

Approximately 1,491 parking spaces would be provided throughout the project site, including 1,008 surface parking spaces for the proposed apartments, 20 surface parking spaces for the proposed retail uses, and 150 parking spaces in the connected garage associated with each single-family residence. The proposed surface parking spaces would be adjacent to the proposed apartment buildings and the proposed retail building. In addition, approximately 25 surface parking spaces and six parking spaces in the garages would be Americans with Disabilities Act (ADA) compatible. Parking for the proposed apartments would comply with the CALGreen Tier 1 parking requirements as outlined per the Santa Rosa Climate Action Plan, which requires that 35 percent of parking spaces are electric-vehicle (EV) ready and 10 percent of parking spaces are electric-vehicle charging stations (EVCS). Parking for the proposed single-family residences would include one EV ready space per garage.

Approximately 336 bicycle parking spaces would be provided throughout the project site. Specifically, in compliance with the CALGreen Tier 1 standards for bicycle parking, approximately 50 short-term bicycle parking spaces would be located proportionally and adjacent to each residential building and approximately 286 long-term bicycle parking spaces would be located near the residential clubhouses. In addition, the proposed project would comply with the City's Zoning Code requirements related to bicycle parking.

The proposed street improvements along Lance Drive, Iroquois Street, and Guerneville Road would include new curbs, gutters, and sidewalks. The proposed project would also include walkable paseos along the exterior and interior of the project site. The proposed project would include a new Class I facility along the boundary of the project site on Guerneville Road.

Dedicated access to the project site for emergency vehicles access would be provided via Guerneville Road, Lance Drive, and Iroquois Street. The proposed project would allow emergency vehicle access to all buildings through the proposed roadway network within the project site. The project site would include 26-foot-wide fire lanes, providing connections between the parcels. Most fire lanes would be within a 150-foot hose-pull distance of all first-floor exterior walls, unless alternative compliance is authorized by the local fire jurisdiction. Fire department access would be provided around all buildings, and windows for egress would be provided at bedrooms.

2.5.2 Lighting

Lighting would include wall-mounted units on the exterior of the buildings, at building entrances, and in open space areas. Exterior pole-mounted fixtures with a maximum luminaire height of 14 feet would be provided in vehicular circulation areas. Decorative low-level pedestrian lighting would be provided along pedestrian pathways. Free-standing monument-type signs would be provided at primary points of entry. All exterior lighting and signage would conform to the City of Santa Rosa Zoning Code, Section 20-30.080, Outdoor Lighting, and Section 20-38.050, General Requirements for All Signs.

2.5.3 Building Design and Sustainability Features

Proposed buildings containing apartments would be Type VA 1-hour rated construction; the proposed single-family residences would be either Type VA or Type VB non-rated construction.⁹

⁹ Type VA and Type VB indicates a building is constructed of any allowable material, including wood construction, with low or no fire-resistant construction.

Each phase of the proposed project would situate residential buildings around communal landscaped amenity spaces. The apartment communities would also incorporate residential clubhouses. The amenity space would be accessible from a network of interconnected walkable paseos and courtyards. Private patios and balconies would provide additional living space for units. Residential buildings would include large windows with views of the surrounding open space, thereby bringing an abundance of natural light to each unit.

Building exteriors would incorporate combinations of stucco wall colors in a variety of light and neutral shades to evoke a modern aesthetic. The communal buildings would incorporate distinctive accent colors and materials. Residential buildings would be fashioned with a parapet to screen mechanical equipment and roof-mounted solar photovoltaic (PV) panels.

Consistent with the City's Climate Action Plan (CAP), the proposed project would include a variety of efficient energy and water design features, including solar PV panels, electric-vehicle charging stations, an all-electric building design, energy-efficient appliances, high-efficiency indoor and outdoor lighting, landscaping with drought-tolerant plant species, and low-flow plumbing fixtures. The project sponsor intends to use a construction waste recycling program during demolition and construction to minimize waste to the extent practicable.

The proposed project would be subject to the State Building Energy Efficiency Standards contained in Title 24, Part 6, of the California Code of Regulations. Title 24, Part 6, which applies to all new construction of both residential and nonresidential buildings, regulates the energy consumed for heating, cooling, ventilation, water heating, and lighting. In addition, in accordance with the City's CAP New Development Checklist, the proposed project would comply with CALGreen Tier 1 standards.

The proposed project would not include any emergency generators.

2.5.4 Landscaping and Heritage Trees

As previously stated, there are 159 existing trees on the project site. Of these, 30 are heritage trees. It is anticipated that 133 trees, including 16 heritage trees, would need to be removed for project construction. Upon project buildout, 126 trees would be provided on the site, including 26 existing trees and 100 new trees. The project would include a landscape plan to compensate for the removal of trees and vegetation and enhance the development. The landscape plan would include planting on-site trees to replace trees removed during construction, in accordance with the City Tree Ordinance (Chapter 17-24). Landscaped areas would include a mix of native and drought-tolerant plantings. Landscaping would comply with the City of Santa Rosa's Low-Impact Development Standards.

2.5.5 Utilities

The proposed project would include the installation of new on-site water, wastewater, stormwater, and dry-utility improvements to serve the project site, as described below. Off-site water and stormwater improvements are also proposed as part of the project. The proposed on-site systems would be privately owned and maintained by the project's property management and/or homeowners association. The proposed off-site improvements would be owned and maintained by Santa Rosa Water.

Water Supply

Santa Rosa Water provides the water service near the project site. On-site water system improvements would include the installation of public and private pipes, valves, private fire hydrants, meters and submeters, and backflow preventers to serve proposed residential and retail uses. Public on-site improvements would include the installation of approximately 2,200 linear-feet of 12-inch water main piping and appurtenances that would serve the proposed project. These public improvements would connect to existing water mains at Iroquois Street, Lance Drive, and Pawnee Street. All public improvements within the on-site development would be within a utility easement. Connections between the public and private water system would include meters and backflow preventers. The private on-site water system would be designed as a looped system to accommodate fire flows and minimize water quality issues (e.g., stagnant flows) typically associated with non-looping, dead-end water lines. Off-site water improvements would include the installation of approximately 900 linear feet of 12-inch water main from the intersection of Ridley Avenue and Guerneville Road to the west boundary of existing assessor's parcel number 036-111-009.

Wastewater

Santa Rosa Water would provide sewer service to the project site. On-site sewer system improvements would include the installation of public and private sewer infrastructure. On-site public improvements may include the installation of approximately 800 linear feet of gravity sewer pipe that would collect flows from the existing Pawnee Street neighborhood that is north of the project site, which is currently fed from an existing sanitary sewer lift station. This gravity main would replace an existing sewer force main that runs along the project site's west boundary. The gravity sewer main would be installed within a public utility easement. Additional site studies are needed to confirm if the proposed utility easement would also include the proposed on-site public water main improvements. Private on-site sanitary sewer improvements would include the installation of approximately 6,100 linear feet of gravity sewer pipes, manholes, and service laterals. Proposed sewer pipes would be between 8 and 24 inches in diameter. The proposed private sewer would connect to an existing public sewer main in Lance Drive and the proposed on-site public gravity sewer that would collect flows from Pawnee Street.

Stormwater

On-site storm drain improvements would include the installation of approximately 7,200 linear feet of gravity storm pipes, manholes, curb and drop inlets, low-impact development best management practice (LID-BMP) treatment systems, trash capture devices, and, potentially, low-flow pumps to convey treatment flows between the on-site storm main and LID BMP treatment systems. The proposed gravity storm pipes would be between 12 and 24 inches in diameter. New connections would connect to existing City storm drain connections in Pawnee Street and/or Lance Drive. Off-site storm drain improvements in Lance Drive would include an estimated 800 linear feet of gravity pipes, curb inlets, and public LID-BMP treatment systems.

Dry Utilities

The project proposes to construct new dry-utility service connections. All electrical and telecommunication utilities would be connected to existing electrical and telecommunication utilities. Each phase of construction would have line-voltage power and multiple telecommunication services.

Solid Waste

The City of Santa Rosa contracts with Recology Sonoma Marin to provide waste collection services. Recology would provide solid waste, recycling, and composting services at the project site. Waste, recyclables, and organic matter generated by the proposed project would be disposed of in the solid waste and recycling enclosures located throughout the project site.

2.6 Project Construction

As discussed in Section 2.5, *Project Components*, the proposed project would be constructed in three phases. Construction of the proposed project is anticipated to begin in late 2024 and end in late 2030, a period of approximately 48 months. Each phase of the project would include the following subphases: (1) demolition, (2) grading and utilities, (3) building construction, (4) paving, and (5) site landscaping.

Demolition would generate approximately 920 cubic yards of material, including trees, concrete, and asphalt. Grading activities would result in cutting approximately 7,000 cubic yards of soil. Site preparation would require filling with approximately 5,000 cubic yards of soil. Construction of the proposed project would not require the export or import of any material; the project site would be a balanced site. The proposed project would excavate to a maximum depth of approximately 2 to 3 feet below the ground surface for the building foundations and a maximum depth of approximately 12 feet below ground surface for the proposed utilities. Piles would not be required. It is not anticipated that dewatering would be required during project construction.

Haul routes for construction deliveries to the project site would exit either U.S. 101 North or South onto Guerneville Road and then traveling to the project site. Demolition materials would be exported from the project site via Guerneville Road onto U.S. 101 North or South to the Republic Services of Sonoma County, Inc. Central Landfill. The haul route for trucks returning to the project site would be in the opposite direction.

Project construction would comply with City noise regulations set forth in Chapter 16, Noise, of the City Code. Section 17-16.040 sets forth criteria for determining violations of the City's Noise Ordinance. These criteria include, but are not limited to, the level of noise, intensity of noise, whether the nature of the noise is usual or unusual, and the proximity of the noise to residential sleeping facilities. Construction activities would occur Monday through Saturday from 7:00 a.m. to 7:00 p.m. No nighttime construction is proposed.

2.7 Required Permits and Approvals

The proposed project would require the following discretionary approvals from the Sonoma County LAFCo:

- Final Annexation Approval

The proposed project would require the following discretionary approvals from the City of Santa Rosa:

- Pre-application Review Process
- Concept Design Review at the Design Review Board

- Modified Design Review, which reduces the level of design review from Major to Minor. Minor Design Review is provided by the Zoning Administrator; however, pursuant to Zoning Code Section 20-16.070, this review and decision can be elevated by the Director of Planning and Economic Development to the Design Review Board.
- Environmental Review
- Minor Conditional Use Permit
- Tentative Tract Map

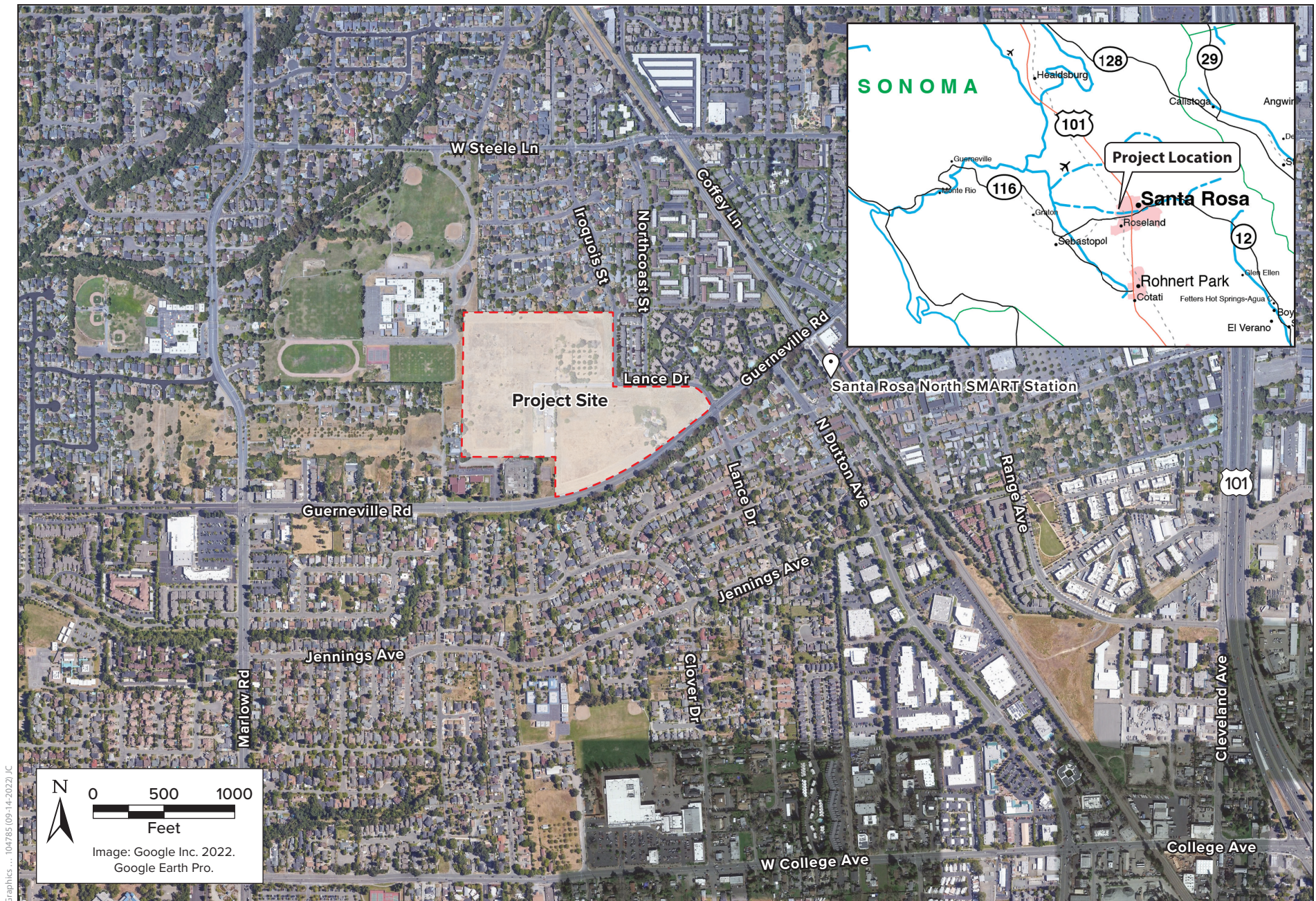


Figure 2-1
Regional Location Map
Lance Drive Project



Figure 2-2
Project Site Vicinity Map
Lance Drive Project



Figure 2-3
City of Santa Rosa Zoning Districts
Lance Drive Project



Figure 2-4
City of Santa Rosa Land Use Designations
 Lance Drive Project

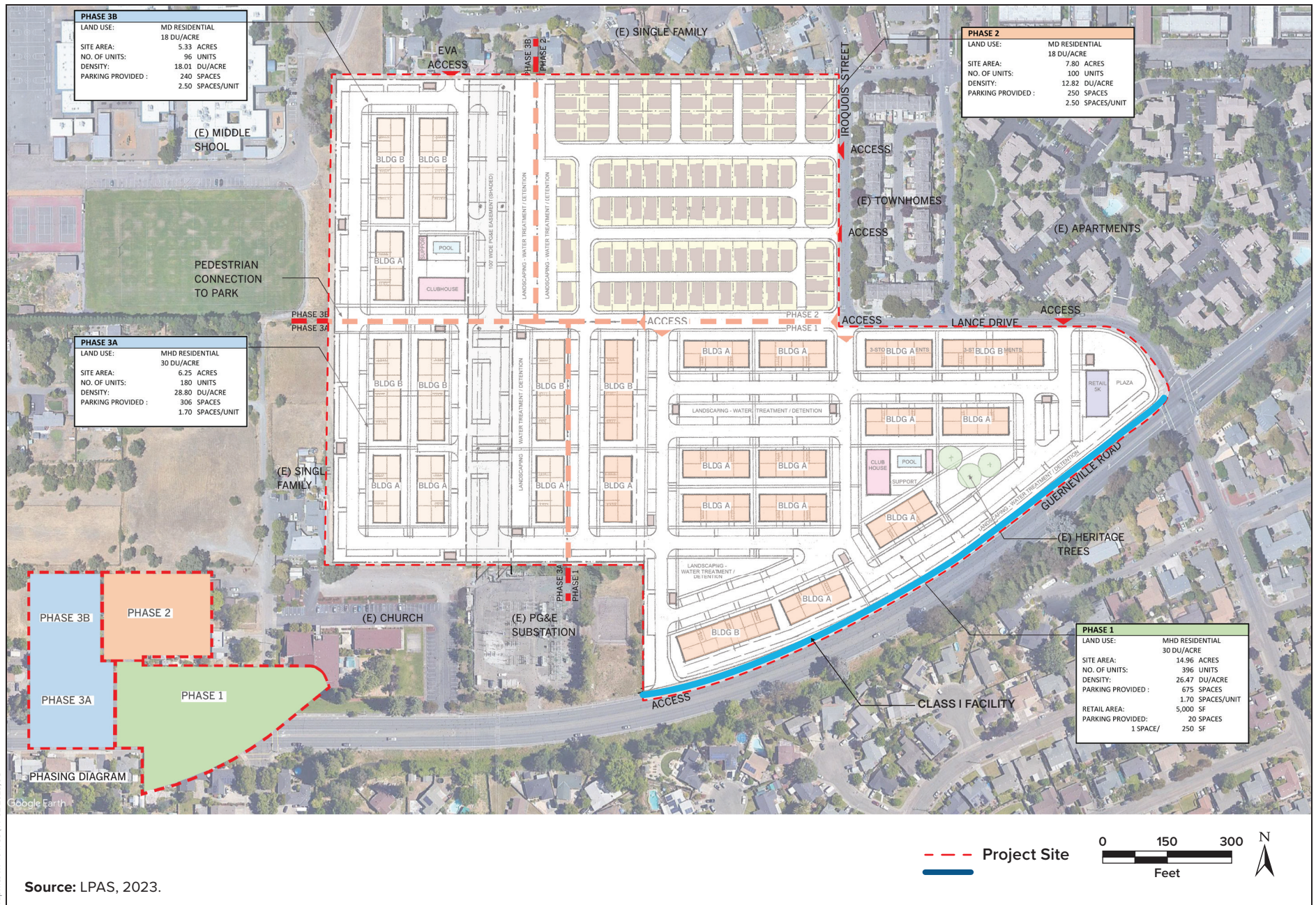


Figure 2-5
Conceptual Site Plan
 Lance Drive Project

Chapter 3

Relevant City Planning Documents

This chapter describes the most relevant planning documents that are applicable to the proposed project.

3.1 City of Santa Rosa General Plan 2035

The City of Santa Rosa General Plan 2035 addresses issues related to physical development, growth management, transportation services, public facilities, community design, energy efficiency, greenhouse gas reduction strategies, and conservation of resources in the City of Santa Rosa General Plan 2035 Planning Area. The City of Santa Rosa General Plan 2035 was adopted by the City Council on November 3, 2009 (Resolution No. 27509).

The City of Santa Rosa General Plan 2035 serves the following purposes:

- Outlines a vision of long-range physical and economic development that reflects the aspirations of the community, and provides specific implementing policies that will allow this vision to be accomplished;
- Establishes a basis for judging whether specific development proposals and public projects are in harmony with said vision;
- Allows city departments, other public agencies, and private developers to design projects that will enhance the character of the community, preserve and enhance critical environmental resources, and minimize hazards; and
- Provides the basis for establishing and setting priorities for detailed plans and implementing programs such as the Zoning Code, specific and area plans, and the Capital Improvement Program.

The City of Santa Rosa General Plan 2035 incorporates significant policy direction from other plans. Policy references from the following plans are included in the City of Santa Rosa General Plan 2035:

- Bicycle and Pedestrian Master Plan
- Citywide Creek Master Plan
- 2007 Downtown Station Area Specific Plan
- North Santa Rosa Station Area Specific Plan
- Economic Sustainability Strategy
- Northern Downtown Pedestrian Linkages Study
- Recreation and Parks Business and Strategic Plan
- Sebastopol Road Urban Vision and Corridor Plan
- Southeast Area Plan
- Southwest Area Plan
- Climate Action Plan

The Southeast and Southwest Area Plans were superseded with the adoption of the City Santa Rosa General Plan 2035. In 2020 the City of Santa Rosa (City) adopted the 2020 Downtown Station Area Specific Plan, which replaced the 2007 Downtown Station Area Specific Plan. The remainder of above-noted plans are in full effect and, where applicable, are referenced for additional goals, policies, and information.

The project site is assigned Medium-Density Residential, Medium High-Density Residential, and Retail and Business Services land use designations in the City of Santa Rosa General Plan 2035 (see Figure 2-4 in Chapter 2, *Project Description*).¹

On February 14, 2023, the City adopted the 2023-2031 Housing Element. The 2023-2031 Housing Element is available online at <https://www.santarosaforward.com/HE>. As of the date of the preparation of this checklist, the City is preparing a Draft Santa Rosa General Plan 2050, an update to the Santa Rosa General Plan 2035, and EIR. The Draft Santa Rosa General Plan 2050 is available online at <https://www.santarosaforward.com/DraftGP>.

3.1.1 City of Santa Rosa General Plan EIR

The Draft EIR for the City of Santa Rosa General Plan 2035 (State Clearinghouse No. 2008092114) was prepared in March 2009. The Draft EIR, together with the Response to Comments Document dated June 2009, constitute the Final EIR for the City of Santa Rosa General Plan 2035. The Final EIR was certified by the Santa Rosa City Council on November 3, 2009 (Resolution No. 27509).

The General Plan EIR reviewed all environmental impacts and effects, identified potentially significant environmental impacts, and developed measures and policies to mitigate impacts. Nonetheless, significant and unavoidable impacts were determined to occur through the implementation of the General Plan. Therefore, the City adopted a statement of overriding considerations, which balances the merits of implementing the General Plan despite the potential environmental impacts. The impacts identified as significant and unavoidable in the City of Santa Rosa General Plan 2035 Final EIR are:

- Increased traffic volumes, delay and a decrease in level of service on area intersections during peak hours
- Contribute to an unacceptable level of service on Highway 101
- Increase population and vehicle miles traveled at a rate greater than that assumed in regional air quality planning and conflict with implementation of the 2005 Bay Area Ozone Strategy
- Conflict with implementation of state or local goals for reducing greenhouse gas emissions
- Inconsistency with the 2005 Bay Area Ozone Strategy

The City of Santa Rosa General Plan 2035 and EIR are available at the Planning and Economic Development Department, 100 Santa Rosa Avenue, Room 3, Santa Rosa, California 95404, during normal business hours and online at <https://srcity.org/392/General-Plan>.

¹ City of Santa Rosa. 2020. *General Plan Land Use Diagram*. December 8. Available: <https://www.srcity.org/DocumentCenter/View/3094/General-Plan-Land-Use-Diagram-PDF-December-2021>. Accessed: September 14, 2023.

3.2 North Santa Rosa Station Area Specific Plan

The project site is within the planning area for the North Santa Rosa Station Area Specific Plan (North Station Area Plan), which was adopted by the City on September 18, 2012 (Resolution No. 28187). The primary purpose of the Specific Plan is to “support future rail transit by increasing the number of residents and employees within walking distance of the North Santa Rosa Sonoma Marin Area Rail Transit (SMART) station by improving pedestrian, bicycle, auto, and transit connections, increasing residential density, promoting economic development, and enhancing aesthetics and quality of life.”² The North Station Area Plan included a land use plan intended to facilitate increases of 464,663 square feet of office, 564,253 square feet of retail, and 100,103 square feet of institutional uses. The North Station Area Plan also includes increases in residential units, including 520 single-family units and 2,160 multi-family units.³ Development potential for the Specific Plan area was determined by assuming buildout of vacant areas and future redevelopment of some built areas within the Plan area.⁴

The Specific Plan area is within an approximately 0.5-mile area centered around the Santa Rosa North SMART station. It encompasses approximately 987 acres. The land use designations referenced in the North Station Area Plan are consistent with those established by the City of Santa Rosa General Plan 2035. The primary objective of the North Station Area Plan is to guide development within the Specific Plan area that supports rail transit by increasing the number of residents and employees within walking distance of the SMART station.⁵ The North Station Area Plan also identifies development opportunity sites with the potential to catalyze improvements in the Specific Plan area. The project site is approximately 0.2 mile northwest of the North Santa Rosa SMART station, which equates to an estimated 7-minute walk. The project site was identified as a development opportunity site because of the potential for parcel consolidation, the site’s suitability for transit-supportive development, and its underutilization (e.g., vacant lands, low building-to-land-value ratio, and/or development with greater potential for change). The North Station Area Plan also envisioned the addition of minor streets on the project site to improve overall circulation.

3.2.1 North Santa Rosa Station Area Specific Plan EIR

The City prepared an EIR for the North Station Area Plan, which was certified by the Santa Rosa City Council on September 18, 2012 (Resolution No. 28187). The North Santa Rosa Station Area Specific Plan EIR (North Station Area Plan EIR) (State Clearinghouse No. 2011122034) evaluated the physical environmental effects of development pursuant to implementation or buildout of the North Station Area Plan. The North Station Area Plan EIR identified three impacts from implementation of the North Santa Rosa Station Area Specific Plan as being significant and unavoidable/cumulatively considerable, including operational air emissions (Impact 3.3.2), cumulative increase in ozone and coarse fine particulate matter (Impact 3.3.6), and congestion on freeway segments (Impact 3.13.2). All other potential impacts were determined to result in no impact, less than significant impacts, or less than significant with implementation of mitigation.

² City of Santa Rosa, 2012. *North Santa Rosa Station Area Specific Plan*, Introduction. Page 1-5.

³ City of Santa Rosa, 2019. *Santa Rosa General Plan*, 2 Land Use Plan. Page 4-10.

⁴ Ibid.

⁵ City of Santa Rosa. 2012. *North Santa Rosa Station Area Specific Plan*. September 18.

3.3 Santa Rosa Zoning City Code

The Santa Rosa City Code implements the goals and policies of the Santa Rosa General Plan 2035 by classifying and regulating the uses of land and structures within the City of Santa Rosa. In addition, the Zoning Code is adopted to protect and promote the public health, safety, and general welfare of residents, and preserve and enhance the aesthetic quality of the City.

Consistent with Section 56652 of the Cortese-Knox-Herzberg Local Government Reorganization Act of 2000, the City adopted pre-zoning districts that would apply to the project site upon annexation (see Figure 2-3 in Chapter 2, *Project Description*).⁶ The pre-zoning districts adopted for the project site include Multi-Family Residential (R-3)—specifically, R-3-18 and R-3-30. The portion of the project site on the corner of Guerneville Road and Lance Drive is pre-zoned Neighborhood Commercial (CN). Most of the project site is in the North Station Area (SA) combining district, which is applied to areas within the North Santa Rosa Station Area Specific Plan boundary.

3.4 Priority Development Area

Priority Development Areas (PDAs) are areas generally near existing job centers or frequent transit that are locally identified (i.e., identified by towns, cities or counties) for housing and job growth. PDAs are one of the four types of growth geographies analyzed in Plan Bay Area 2050, the region's Sustainable Communities Strategy. The project site is located within the "Santa Rosa: North Station Area" as shown on Map 9 of the Priority Development Area Investment and Growth Strategy Update.⁷ The North Santa Rosa Station Area PDA is centered around the Santa Rosa North SMART station with development guided by the North Santa Rosa Station Area Specific Plan. As of 2017, a total of 2,700 new housing units were anticipated within the PDA for a total of approximately 6,700 by 2035.

3.5 Santa Rosa Climate Action Plan

On December 4, 2001, the Santa Rosa City Council adopted a resolution to become a member of Cities for Climate Protection (CCP), a project of the International Council on Local Environmental Initiatives (ICLEI). On August 2, 2005, the Santa Rosa City Council adopted Council Resolution No. 26341, which established a municipal greenhouse gas reduction target of 20 percent from 2000 levels by 2010 and facilitates the community-wide greenhouse gas reduction target of 25 percent from 1990 levels by 2015.

In October 2008, the Sonoma County Community Climate Action Plan (CAP) was released, which formalized countywide greenhouse gas (GHG) reduction goals. In 2009, the Regional Climate Protection Authority (RCPA) was created to improve coordination on climate change issues and establish a clearinghouse for countywide efforts to reduce GHG emissions. Also, in 2009, the City adopted a revised General Plan that includes a number of policies directed at greenhouse gas emissions reduction.

⁶ Governor's Office of Planning and Research. 2012. *LAFCOs, General Plans, and City Annexations*. February 7. Available: https://www.sbcounty.gov/uploads/lafco/items/201205/item_11_supplemental.pdf. Accessed: September 14, 2023.

⁷ Sonoma County Transportation Authority. 2017. *Priority Development Area Investment and Growth Strategy Update*. Adopted June 12, 2017. Available: <https://scta.ca.gov/wp-content/uploads/2017/05/PDA-IGS-2017-update.pdf>, Accessed: November 2, 2023.

On June 5, 2012, the City of Santa Rosa adopted a Climate Action Plan, which meets the programmatic threshold for a Qualified GHG Reduction Strategy, established by the Bay Area Air Quality Management District (BAAQMD) guidelines. The Climate Action Plan was adopted to reduce GHG emissions and outline a path for the City to achieve its locally-adopted community-wide per-service-population GHG emissions reduction goal of 25 percent below 1990 levels by 2015 and the state-recommended reduction target of 15 percent below 2007 levels by 2020. The Climate Action Plan also forecasts annual GHG emissions and provides reduction targets for 2035.

On August 6, 2013, the City of Santa Rosa adopted a Municipal Climate Action Plan. On January 14, 2020, the Santa Rosa City Council adopted Resolution No. RES-2020-002 declaring a climate emergency and immediate emergency mobilization to restore a safe climate. The resolution establishes a 2030 carbon neutrality goal. As of 2022, the City is pursuing an update to the Climate Action Plan as part of the General Plan update process.

3.6 Santa Rosa Resilient City Measures

In May 2018 the City Council adopted Ordinance 2018-012, introducing Chapter 20-16 (Resilient City Development Measures) to the Santa Rosa City Code. Chapter 20-16 was adopted to address housing needs and economic development within the City of Santa Rosa following the Tubbs and Nuns fires of 2017. The City Council adopted amendments to modify and extend the temporary Resilient City Development Measures in response to the need for continued fire and COVID-19 pandemic recovery effective January 1, 2021, which extends the Ordinance through December 31, 2023. The Ordinance addresses these needs through streamlined review processes including reduced review authority for certain land uses, and modifications to the design review process. The proposed project would require Modified Design Review, which reduces the level of design review from Major to Minor. Minor Design Review is provided by the Zoning Administrator; however, pursuant to Zoning Code Section 20-16.070, this review and decision can be elevated by the Director of Planning and Economic Development to the Design Review Board.

Chapter 4

Consistency Analysis & Environmental Checklist

This chapter includes a discussion of the Lance Drive Project's (proposed project's) consistency with applicable North Santa Rosa Station Area Specific Plan (North Station Area Plan) goals and policies identified in the North Station Area Plan Environmental Impact Report (EIR) to reduce environmental impacts. Each resource-specific section in this chapter briefly summarizes the conclusions of the North Station Area Plan EIR, presents the potential impacts of the project relative to the impacts from implementation of the North Station Area Plan, and identifies relevant mitigation measures from the North Station Area Plan EIR applicable to the proposed project.

4.1 North Station Area Plan Consistency Analysis

To demonstrate compliance with California Environmental Quality Act (CEQA) Guidelines Section 15182, this section evaluates the proposed project's consistency with applicable North Station Area Plan goals and policies related to land use, private realm design standards and guidelines, circulation, and infrastructure and public facilities identified in the North Station Area Plan EIR to avoid or reduce environmental impacts. Table 4-1 provides an analysis of the proposed project's consistency with the relevant North Station Area Plan goals and policies.

Table 4-1. Consistency of the Proposed Project with the North Station Area Plan

North Station Area Plan Goals and Policies	Consistency Analysis
Land Use	
Goal LU-1. Provide for a comprehensive mix of transit-supportive land uses.	Consistent. The project would include both residential and retail uses within walking distance of the Sonoma Marin Area Rail Transit (SMART) station. In addition, the project would provide approximately 336 bicycle parking spaces throughout the project site in addition to street improvements along Lance Drive, Iroquois Street, and Guerneville Road, including new sidewalks. The proposed project would also include walkable paseos along the exterior and interior of the project site as well as a new Class I bike facility along the boundary of the project site on Guerneville Road.
Policy LU-1.1. Intensify land uses and increase residential densities in the project area to support future transit improvements and ridership and provide a significant number of new residential units.	Consistent. The proposed project would redevelop the 34.9-acre site, currently occupied by primarily undeveloped pastureland and two single-family homes, with up to 772 dwelling units, consisting of 672 apartments and 100 single-family residences. The project would incorporate pedestrian and bike facilities and improvements and be approximately 0.2 mile away from the SMART station.

North Station Area Plan Goals and Policies	Consistency Analysis
Policy LU-1.2. Support transit-oriented development in the project area by allowing adequate intensity of use and requiring pedestrian-oriented development (e.g., buildings along sidewalks, minimized parking lots).	Consistent. Refer to Goal LU-1, above, for the discussion regarding project consistency.
Goal LU-4. Promote sustainable site design.	Consistent. The proposed project would include a variety of efficient energy and water features, including solar photovoltaic panels, electric-vehicle charging stations, an all-electric building design, energy-efficient appliances, high-efficiency indoor and outdoor lighting, landscaping with drought-tolerant plant species, and low-flow plumbing fixtures. In addition, the proposed project would comply with California Green Building Standards Code (CALGreen) Tier 1 standards.
Policy LU-4.1: Promote site and building designs that improve energy efficiency by incorporating natural cooling and passive solar heating. This may include extended eaves, window overhangs, awnings, tree placement for natural cooling, and building and window orientation to take advantage of passive solar heating in the winter and natural cooling in the summer.	Consistent. Refer to Goal LU-4, above, for the discussion regarding project consistency.
Policy LU-4.3: Encourage green site design by utilizing native and/or drought-tolerant trees and plants where possible, incorporating permeable paving, and designing resource-efficient landscapes and gardens.	Consistent. The proposed project would include landscaping with drought-tolerant plant species and install low-flow plumbing fixtures. The project would also incorporate low-impact development/best management practices (LID-BMP) in treatment systems.
Goal AH-1. Provide a variety of housing types and densities in the specific plan area, including those affordable to lower-income households.	Consistent. The proposed project would construct 772 dwelling units, consisting of 672 apartments and 100 single-family residences; either 8 percent of the total number of new dwelling units would be affordable to low-income households or at least 5 percent of the total number of new dwelling units would be affordable to very low-income households.
Policy AH-1.1. Utilize existing City programs and policies to encourage and facilitate development of affordable housing within the specific plan area.	Consistent. Refer to Goal AH-1, above, for the discussion regarding project consistency.
Goal AH-3: Create housing opportunities for a diverse population.	Consistent. Refer to Goal AH-1, above, for the discussion regarding project consistency.
Policy AH-3.1: Encourage the development of housing for all groups, including students and seniors, particularly near the SMART station and the pedestrian/bicycle bridge.	Consistent. The proposed project would construct up to 772 dwelling units within walking distance of the SMART station. Of these 772 dwelling units, either 8 percent of the total number of new dwelling units would be affordable to low-income households or at least 5 percent of the total number of new dwelling units would be affordable to very low-income households.

North Station Area Plan Goals and Policies	Consistency Analysis
Private Realm Development Standards, Design Guidelines, and Urban Design	
Goal UD-1: Transform the project area into a vibrant, distinct place where people want to live, work, and visit.	Consistent. The proposed project would redevelop the 34.9-acre site, currently occupied by primarily undeveloped pastureland and two single-family homes, with residential and retail uses. The proposed project would situate residential buildings around communal landscaped amenity spaces. The amenity spaces would be accessible from a network of interconnected, walkable paseos and courtyards. Private patios and balconies would provide additional living space for units.
Policy UD-1.5: Enhance entryways into the project area with special gateway features. Treatments to announce arrival may include special architectural features such as tower elements on corner buildings and/or intersection enhancements such as special paving, public artwork, gateway signs, colorful landscaping, and/or trees.	Consistent. The proposed project would situate residential buildings around communal landscaped amenity spaces. The amenity spaces would be accessible from a network of interconnected, walkable paseos and courtyards. Private patios and balconies would provide additional living space for units. Residential buildings would include large windows with views of the surrounding open space, thereby bringing an abundance of natural light to each unit. Building exteriors would incorporate combinations of stucco wall colors in a variety of light and neutral shades to evoke a modern aesthetic. The communal buildings would incorporate distinctive accent colors and materials.
Goal UD-2: Create a safe, desirable, and functional environment for bicyclists and pedestrians.	Consistent. The proposed on-site amenities would include common and private open space areas; swimming pools; pet parks; courtyards; a network of interconnected, walkable paseos (or pathways); and communal landscaped amenity areas. Buildings would be located along these walkable paseos. The proposed project would include a new Class I bike facility along the boundary of the project site on Guerneville Road as well as new sidewalks along Lance Drive, Iroquois Street, and Guerneville Road. In addition, decorative low-level pedestrian lighting would be provided along pedestrian pathways.
Policy UD-2.2: Locate buildings near the back of the sidewalk to create a continuous street edge and facilitate a more dynamic and vibrant streetscape.	Consistent. Refer to Goal UD-2, above, for the discussion regarding project consistency.
Goal UD-4: Create a pleasant pedestrian experience by providing amenities and furnishings (lighting, benches, canopy trees, etc.).	Consistent. Refer to Goal UD-2, above, for the discussion regarding project consistency.
Policy UD-4.1: Provide pedestrian amenities with a consistent visual appearance throughout the project area to encourage walking, identify pathways, and make the station area a comfortable and easy place to pass through or visit.	Consistent. Refer to Goal UD-2, above, for the discussion regarding project consistency.

North Station Area Plan Goals and Policies	Consistency Analysis
Policy UD-4.2: Install streetscape furnishings, as identified in Chapter 7, Section 7.4, Street Furnishing Standards, along all pedestrian/bicycle paths and arterials to improve safety, pedestrian comfort, and aesthetics in the project area.	Consistent. Refer to Policy C-7.3, below, for the discussion regarding project consistency.
Policy UD-4.3: Provide appropriately scaled and designed lighting for all modes of travel throughout the station area. Pedestrian paths, surface parking areas, alleyways, parks, and urban plazas should be well lighted for safety	Consistent. Refer to Policy C-7.3, below, for the discussion regarding project consistency.
Circulation Plan	
Goal C-2. Provide parking appropriate to transit-oriented development.	Consistent. Approximately 1,491 parking spaces would be provided throughout the project site, including 1,008 surface parking spaces for the proposed apartments, 20 surface parking spaces for the proposed retail uses, and 150 parking spaces in the connected garage associated with each single-family residence. The parking spaces provided by the proposed project would be compliance with the City of Santa Rosa's (City's) parking code requirements.
Policy C-2.2. Encourage all developments to reduce parking demand through an appropriate mechanism such as pricing, unbundled parking, shared parking, transit passes, bicycle amenities, pedestrian amenities, car-share programs, employee TDM, or employer-provided discount transit passes.	Consistent. As stated above, 336 bicycle parking spaces would be provided throughout the project site, including 50 short-term bicycle parking spaces adjacent to each residential building and 286 long-term parking spaces near residential clubhouses. In addition, street improvements along Lance Drive, Iroquois Street, and Guerneville Road would provide improved pedestrian amenities for the community, thereby encouraging walking. The proposed project would also include walkable paseos along the interior and exterior of the project site as well as a new Class I bike facility along the boundary of the project site on Guerneville Road. Furthermore, the project site would be approximately 0.2 mile from the SMART station and accessible from existing Santa Rosa CityBus and Sonoma County Transit bus routes.
Goal C-3. Provide multimodal connections throughout the project area.	Consistent. Refer to Policy C-2.2, above, for the discussion regarding project consistency.
Policy C-3.1. Improve connections in the project area by creating new streets or extensions of existing streets, as identified in the Circulation Plan.	Consistent. The project would provide street improvements along Lance Drive, Iroquois Street, and Guerneville Road, including new sidewalks, curbs, and gutters.
Policy C-3.5. Identify gaps and build sidewalks to complete the pedestrian network in neighborhoods and commercial areas.	Consistent. Refer to Policy C-3.1, above, for the discussion regarding project consistency.
Policy C-7.3. Install streetscape furnishings such as benches and lighting, as identified in Table 7.4, Street Furnishing Types & Guidelines, along all pedestrian/bicycle paths to improve safety and pedestrian comfort, where possible.	Consistent. Decorative low-level pedestrian lighting would be provided along pedestrian pathways. All exterior lighting and signage would conform to the City of Santa Rosa Zoning Code, Section 20-30.080, Outdoor Lighting, and Section 20-38.050, General Requirements for All Signs.

North Station Area Plan Goals and Policies	Consistency Analysis
Infrastructure and Public Facilities	
Goal PF-1. Support anticipated level of development intensity in project area with adequate infrastructure.	Consistent. On-site sewer system improvements would include the installation of public and private sewer infrastructure, including gravity sewer pipes, manholes, and service laterals. Off-site water and stormwater improvements are also proposed as part of the project. On-site water system improvements would include the installation of public and private pipes, valves, private fire hydrants, meters and submeters, and backflow preventers to serve proposed residential and retail uses. On-site storm drain improvements would include the installation of gravity storm pipes, manholes, curb and drop inlets, LID-BMP treatment systems, and trash capture devices. The project also proposes the construction of new dry-utility service connections to existing electrical and telecommunication utilities.
Policy PF-1.1. Provide utility upgrades as needed to support increased density and intensity in the area.	Consistent. Refer to Goal PF-1, above, for the discussion regarding project consistency.
Policy PF-1.2. Explore options to underground existing overhead facilities to improve the aesthetics and reliability of the utilities.	Consistent. The proposed on-site sewer system improvements, on-site storm drain improvements, on-site water system improvements, and on-site electrical and telecommunication utilities would be constructed underground wherever feasible.
Goal PF-3. Provide funding for public services and utilities in the plan area.	Consistent. To address potential demand generated by the proposed project, the project would include on-site infrastructure improvements related to water, fire water, sewer, and stormwater services. In addition, the project sponsor would be required pay for or implement contributions related to public services and improvements that support infrastructure.
Policy PF-3.1. Ensure that private development provides its fair share of funding for necessary improvements to public services and utilities in the plan area.	Consistent. Refer to Goal PF-3, above, for the discussion regarding project consistency.
Goal PF-4. Ensure adequate water supply is available to serve existing and new development in the plan area.	Consistent. Santa Rosa Water provides the water service near the project site. On-site water system improvements would include the installation of public and private pipes, valves, private fire hydrants, meters and submeters, and backflow preventers to serve proposed residential and retail uses.
Policy PF-4.2. New development and streetscape landscaping shall employ water conservation and reuse measures.	Consistent. Refer to Policy LU-4.3, above, for the discussion regarding project consistency.
Policy PF-4.3. Program construction of needed water system improvements as part of the City's Capital Improvement Program as timing or conditions warrant.	Consistent. The proposed project would include landscaping with drought-tolerant plant species as well as low-flow plumbing fixtures.

North Station Area Plan Goals and Policies	Consistency Analysis
Goal PF-6. Solid waste disposal needs of existing and new development in the plan area should be met while providing opportunities for reduction, reuse, and recycling.	Consistent. The City contracts with Recology Sonoma Marin to provide waste collection services. Recology would provide solid waste, recycling, and composting services at the project site. Waste, recyclables, and organic matter generated by the proposed project would be disposed of in the solid waste and recycling enclosures located throughout the project site.
Policy PF-6.1. Expand recycling efforts in multifamily and commercial projects in the plan area and continue to encourage recycling by all residents.	Consistent. Refer to Goal PF-6, above, for the discussion regarding project consistency.
Policy PF-6.2. New development requiring demolition of existing structures in the plan area should reuse and recycle materials to the greatest extent possible.	Consistent. Demolition would generate approximately 920 cubic yards of material, including trees, concrete, and asphalt. The project sponsor intends to use a construction waste recycling program during demolition and construction to minimize waste to the extent practicable.
Goal PF-7. Manage, maintain, and improve stormwater drainage and capacity in the plan area.	Consistent. On-site storm drain improvements would include the installation of approximately 7,200 linear feet of gravity storm pipes, manholes, curb and drop inlets, LID-BMP treatment systems, trash capture devices, and, potentially, low-flow pumps to convey treatment flows between the on-site storm main and LID-BMP treatment systems. Off-site storm drain improvements in Lance Drive would include an estimated 800 linear feet of gravity pipes, curb inlets, and public LID-BMP treatment systems.
Policy PF-7.1. New development and capital improvement projects shall reduce pollution and runoff flows impacting Paulin and Steele creeks by following the City's Storm Water Low-Impact Development Technical Design Manual.	Consistent. Refer to Goal PF-7, above, for the discussion regarding project consistency.
Goal PF-9. Provide fire and police services that ensure the safety of the plan area community.	Consistent. Dedicated access to the project site for emergency vehicles would be provided via Guerneville Road, Lance Drive, and Iroquois Street. The proposed project would allow emergency vehicle access to all buildings through the proposed roadway network within the project site. The project site would include 26-foot-wide fire lanes, providing connections between the parcels. Most fire lanes would be within a 150-foot hose-pull distance of all first-floor exterior walls unless alternative compliance is authorized by the local fire jurisdiction. Fire department access would be provided around all buildings, and windows for egress would be provided at bedrooms.
Policy PF-9.1. Require developers to comply with Santa Rosa Fire Department requirements for multiple-story buildings to ensure adequate space for firefighting.	Consistent. Refer to Goal PF-9, above, for the discussion regarding project consistency.

The discussion below provides an overview of the proposed project's compliance with the goals and policies identified in the following chapters of the North Station Area Plan: Land Use Plan; Private Realm Development Standards, Design Guidelines, and Urban Design Policies; Circulation Plan; and Infrastructure and Public Facilities.

Project Compliance with Land Use Goals and Policies

The proposed project would redevelop the 34.9-acre site, currently occupied by primarily undeveloped pastureland and two single-family homes, with up to 772 dwelling units, consisting of 672 apartments and 100 single-family residences. Of these 772 dwelling units, either 8 percent of the total number of new dwelling units would be affordable to low-income households or at least 5 percent of the total number of new dwelling units would be affordable to very low-income households. In addition, the project would incorporate pedestrian-oriented development, such as walkable paseos along the exterior and interior of the project site, and a new Class I facility along the boundary of the project site on Guerneville Road. Furthermore, the proposed project would include a variety of efficient energy and water features, including solar photovoltaic panels, electric-vehicle charging stations, an all-electric building design, energy-efficient appliances, high-efficiency indoor and outdoor lighting, landscaping with drought-tolerant plant species, and low-flow plumbing fixtures. Based on the above, the proposed project would be in compliance with the goals and policies identified in the Land Use Plan chapter of the North Station Area Plan to avoid or reduce environmental impacts.

Project Compliance with Private Realm Development Standards, Design Guidelines, and Urban Design Goals and Policies

The proposed project would situate residential buildings around communal landscaped amenity spaces. The amenity spaces would be accessible from a network of interconnected walkable paseos and courtyards. Private patios and balconies would provide additional living space for units. Residential buildings would include large windows with views of the surrounding open space, thereby bringing an abundance of natural light to each unit. Building exteriors would incorporate combinations of stucco wall colors in a variety of light and neutral shades to evoke a modern aesthetic. The communal buildings would incorporate distinctive accent colors and materials. The project would comply with the City of Santa Rosa Zoning Code, Section 20-30.080, Outdoor Lighting, and Section 20-38.050, General Requirements for All Signs, and provide decorative low-level lighting along pedestrian pathways. In addition, free-standing monument-type signs would be provided at primary points of entry. Furthermore, the project does not require or propose rehabilitation, preservation, or adaptive reuse of a designated historic resource. Based on the above, the proposed project would be in compliance with the goals and policies identified in the Private Real Development Standards, Design Guidelines, and Urban Design chapter of the North Station Area Plan to avoid or reduce environmental impacts.

Project Compliance with Circulation Plan Goals and Policies

The proposed project would provide street improvements along Lance Drive, Iroquois Street, and Guerneville Road, including new sidewalks. The proposed project would also include walkable paseos along the exterior and interior of the project site as well as a new Class I facility along the boundary of the project site at Guerneville Road. In addition, 336 bicycle parking spaces would be provided throughout the project site, including 50 short-term bicycle parking spaces adjacent to each residential building and 286 long-term parking spaces near residential clubhouses. The project site is 0.2 mile from

the SMART station and accessible from existing Santa Rosa CityBus and Sonoma County Transit bus routes. Based on the above, the proposed project would be in compliance with the goals and policies in the Circulation Plan chapter of the North Station Area Plan to avoid or reduce environmental impacts.

Project Compliance with Infrastructure and Public Facilities Goals and Policies

The project would be in compliance with goals and policies related to infrastructure and public facilities. Specifically, the project would be in compliance with policies related to utilities and consistent with local and regional guidance. The proposed project would include on-site sewer system improvements. This would include the installation of public and private sewer infrastructure, including gravity sewer pipes, manholes, and service laterals. Off-site water and stormwater improvements are also proposed as part of the project. On-site water system improvements would include the installation of public and private pipes, valves, private fire hydrants, meters and submeters, and backflow preventers to serve proposed residential and retail uses. On-site storm drain improvements would include the installation of gravity storm pipes, manholes, curb and drop inlets, LID-BMP treatment systems, and trash capture devices. The project proposes the construction of new dry-utility service connections to existing electrical and telecommunication facilities. In addition, the project would abide by regional waste guidelines. The City contracts with Recology Sonoma Marin to provide waste collection services. Recology would provide solid waste, recycling, and composting services at the project site. Waste, recyclables, and organic matter generated by the proposed project, including demolition waste, would be disposed of in the solid waste and recycling enclosures located throughout the project site. The project sponsor intends to use a construction waste recycling program during demolition and construction to minimize waste to the extent practicable.

Dedicated access to the project site for emergency vehicles would be provided via Guerneville Road, Lance Drive, and Iroquois Street. The proposed project would allow emergency vehicle access to all buildings through the proposed roadway network within the project site. The project site would include 26-foot-wide fire lanes, providing connections between the parcels. Most fire lanes would be within a 150-foot hose-pull distance of all first-floor exterior walls unless alternative compliance is authorized by the local fire jurisdiction. Fire department access would be provided around all buildings, and windows for egress would be provided for bedrooms.

Based on the above, the proposed project would be in compliance with the goals and policies in the Infrastructure and Public Facilities chapter of the North Station Area Plan to avoid or reduce environmental impacts.

Summary of Project Consistency with the North Station Area Plan

As demonstrated in Table 4.1, the proposed project would be in compliance with relevant North Station Area Plan goals and policies, including policies that address potential environmental impacts, as identified in the North Station Area Plan EIR. As demonstrated in the discussion above, the proposed project would be consistent with the various implementing policies in the North Station Area Plan's Land Use Plan; Private Realm Development Standards, Design Guidelines, and Urban Design Policies; Circulation Plan; and Infrastructure and Public Facilities. Therefore, pursuant to CEQA Guidelines Section 15182, the proposed project would not introduce any new or more severe impacts relative to the North Station Area Plan EIR.

4.2 Environmental Checklist

To demonstrate compliance with CEQA Guidelines Sections 15168(c) and 15162, this section briefly summarizes the conclusions of the North Station Area Plan EIR, presents the potential impacts of the project relative to the impacts of the implementation of the North Station Area Plan, and identifies relevant mitigation measures from the North Station Area Plan EIR applicable to the proposed project.

As discussed under Section 3.2.1, *North Santa Rosa Station Area Specific Plan EIR*, in Chapter 3, *Relevant City Planning Documents*, the North Station Area Plan EIR identified three impacts from implementation of the North Station Area Plan as being significant and unavoidable/cumulatively considerable, consisting of operational air emissions (Impact 3.3.2), cumulative increase in ozone and coarse fine particulate matter (Impact 3.3.6), and congestion on freeway segments (Impact 3.13.2). All other potential impacts were determined to result in no impact, less-than-significant impacts, or impacts that would be less than significant with implementation of mitigation.

Scope and Content of the Checklist

This checklist provides an analysis of potential environmental impacts resulting from the project. Following the format of the North Station Area Plan EIR, environmental effects are evaluated in this checklist to determine if the project would result in a potentially significant impact that would trigger additional review under CEQA Guidelines Section 15168. Subsequent to certification of the North Station Area Plan EIR, CEQA Guidelines have undergone several changes, including a comprehensive update, effective December 28, 2018.¹ However, the checklist categories in this document follow the North Station Area Plan EIR.

The checklist evaluates the potential impacts of the proposed project on the following environmental topics:

- Aesthetics and Visual Resources
- Agricultural and Forestry Resources
- Air Quality
- Biological Resources
- Cultural and Paleontological Resources
- Geology and Soils
- Hazardous Materials/Human Health
- Hydrology and Water Quality
- Land Use
- Noise
- Population, Housing, and Employment
- Public Services and Utilities
- Traffic and Circulation
- Climate Change and Greenhouse Gases

The column titles of the checklist have been modified from CEQA Guidelines Appendix G to help answer the questions to be addressed under CEQA Guidelines Section 15168. The checklist columns are:

- Where in the Prior EIR is This Topic Discussed?²
- Did the Prior EIR Identify a Significant Impact and Mitigation Measures for This Topic?
- Do Any Prior EIR Mitigation Measures Apply to the Project for This Topic?
- Are There Any Changes to the Project or New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?
- Is There Any New Information of Substantial Importance Requiring New Analysis?

¹ See PRC Section 21002.1(e), 210065; CEQA Guidelines Sections 15002(a)(1), 15003(c).

² For the purposes of this checklist, *Prior EIR* refers to the North Station Area Plan EIR.

A “no” answer in last two checklist columns listed above does not necessarily mean that there are no potential impacts relative to the environmental topic. Rather, a “no” answer means that the proposed project would not result in substantial changes in circumstances or new information of substantial importance that result in new or more substantially more severe significant effects or new feasible mitigation measures or alternatives.

Impacts Not Evaluated Further in This Checklist

The North Station Area Plan EIR assumed that the project site would be developed with residential and commercial uses. The proposed project would have the same land uses as well as the same development footprint and density as assumed in the North Station Area Plan EIR. Overall, the proposed project would be consistent with the development assumptions for the project site in the North Station Area Plan EIR. Therefore, environmental topics that address project impacts related to the location, size, height, and vertical depth of impacts would have the same impact determinations as anticipated in the North Station Area Plan EIR. In addition, the North Station Area Plan EIR concluded that implementation of the North Station Area Plan would result in “no impact” or a “less-than-significant impact” for the environmental topics listed below. For these reasons, the environmental topics listed below are not evaluated any further in this checklist, and the impact determinations for these topics from the North Station Area Plan EIR remain applicable to the proposed project:

- Agricultural and Forestry Resources
- Cultural and Paleontological Resources (archeological resources, paleontological resources, human remains)³
- Geology and Soils
- Hydrology and Water Quality
- Land Use
- Population, Housing, and Employment

Impacts Evaluated Further in This Checklist

The North Station Area Plan EIR identified mitigation measures for all of the environmental topics listed below except built-environment resources and traffic and circulation. Although the North Station Area Plan EIR did not identify mitigation measures for impacts related to built-environment resources or traffic and circulation, these topics that may be of interest to the public and decision makers and are therefore evaluated further in this checklist. For these reasons, the environmental topics listed below are evaluated further in this checklist:

- Aesthetics and Visual Resources
- Air Quality
- Biological Resources
- Cultural and Paleontological Resources (built-environment resources)
- Hazardous Materials/Human Health
- Noise
- Public Services and Utilities
- Traffic and Circulation
- Climate Change and Greenhouse Gases

³ Tribal cultural resources was not a separate environmental topic in CEQA Guidelines Appendix G when the North Station Area Plan EIR was prepared. The proposed project would result in no impact related to tribal cultural resources, consistent with the conclusion in the North Station Area Plan EIR.

The *Discussion* for each environmental topic evaluated in this checklist includes the following components:

- Summary of the impact conclusions in the North Station Area Plan EIR;
- Identification of mitigation measures prescribed in the North Station Area Plan EIR (where applicable);
- Assessment of the applicability of the mitigation measures identified in the North Station Area Plan EIR to the proposed project;
- Identification the level of significance for the project impact; and
- Evaluation of whether the project impact would be consistent with the conclusion in the North Station Area Plan EIR.

As described in more detail in the following sections, although the impacts of the project would be consistent with or slightly less than those analyzed for the North Station Area Plan in the North Station Area Plan EIR, these changes would be minor and would not affect the significance conclusions in the certified North Station Area Plan EIR.

Chapter 6, *Environmental Conditions of Approval*, includes the full text of the mitigation measures identified in the North Station Area Plan EIR that would be applicable to the proposed project, as discussed in this checklist.

Aesthetics and Visual Resources

Issues (and Supporting Information Sources)	Where in the Prior EIR is This Topic Discussed?	Did the Prior EIR Identify a Significant Impact and Mitigation Measures for This Topic?	Do Any Prior EIR Mitigation Measures Apply to the Project for This Topic?	Are There Any Changes to the Project or New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Is There Any New Information of Substantial Importance Requiring New Analysis?
An impact on aesthetics and visual resources is considered significant if the project would:					
1) Have a substantial adverse effect on a scenic vista.	Impact 3.1.1, p. 3.1-10	No	No	No	No
2) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway.	Impact 3.1.2, pp. 3.1-10 and 3.1-11	No	No	No	No
3) Substantially degrade the existing visual character or quality of the site and its surroundings.	Impact 3.1.3, pp. 3.1-11 and 3.1-12	No	No	No	No
4) Create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area.	Impact 3.1.4, pp. 3.1-12 and 3.1-13	Yes, MM 3.1.4	Yes, MM 3.1.4	No	No

Discussion

No substantial change in the environmental setting related to aesthetics and visual resources has occurred since certification of the North Station Area Plan EIR, as described in Section 3.1, *Aesthetics and Visual Resources*, of the North Station Area Plan EIR.

Scenic Vistas

The analysis of impacts on scenic vistas is included in the North Station Area Plan EIR as Impact 3.1.1 (page 3.1-10). The construction of taller buildings may block scenic views from the planning area of the surrounding foothills of Sonoma Mountain and the foothills west of the Santa Rosa. The North Station Area Plan would integrate existing City of Santa Rosa (City) goals, policies, and guidelines, which aim to preserve scenic views and vistas. The North Station Area Plan's development standards and design guidelines generally require setbacks at appropriate places for new development taller than three stories in an effort to prevent an impact on scenic views and vistas. The North Station Area Plan EIR concluded that impacts on scenic vistas would be less than significant.

The proposed project would be subject to the same City goals, policies, and guidelines as development under the North Station Area Plan that aim to preserve scenic views and vistas. For example, the maximum building height would be three stories, or approximately 40 feet.⁴ The proposed project would be required to comply with the North Station Area Plan's development standards and design guidelines that generally require setbacks at appropriate places for new development taller than three stories. Therefore, the impact would be **less than significant**, consistent with the conclusion in the North Station Area Plan EIR.

Scenic Resources

The analysis of impacts on scenic resources is included in the North Station Area Plan EIR as Impact 3.12 (pages 3.1-10 and 3.1-11). Because the planning area does not include portions of a state scenic highway, the North Station Area Plan EIR concluded there would be no impact on scenic resources within a state scenic highway. U.S. 101 is identified in the City of Santa Rosa General Plan 2035 (General Plan) as a scenic roadway through the planning area. With implementation of the City Zoning Code and design guidelines, which aim to preserve and protect scenic resources, the North Station Area Plan EIR concluded there would be less-than-significant impacts on scenic resources along U.S. 101.

The project site is approximately 0.8 mile east of U.S. 101. It is not visible from U.S. 101. Therefore, there would be **no impact**. That level of impact would be less than what was concluded in the North Station Area Plan EIR; therefore, the impact is within the level of impact already considered in the North Station Area Plan EIR.

Visual Character

The analysis of impacts on visual character is included in the North Station Area Plan EIR as Impact 3.1.3 (pages 3.1-11 and 3.1-12). According to the North Station Area Plan EIR, the majority of the planning area contains residential, retail, office, institutional, and industrial land uses. It does not contain unique visual features. With continued implementation of applicable General Plan policies

⁴ The building height is measured to the top of rooftop appurtenances.

and City design guidelines, as well as adoption of the North Station Area Plan's design guidelines, the North Station Area Plan EIR concluded that impacts on existing visual character would be less than significant.

The project site includes two single-family homes and associated structures but is primarily undeveloped pastureland. Surrounding land uses include single-family and multi-family residential development to the north, east, and south. Hillard Comstock Middle School is adjacent to the northwest corner of the project site, and Crosspoint Community Church and a Pacific Gas and Electric (PG&E) substation are adjacent to the southwest corner of the site. The proposed project would construct 772 dwelling units, approximately 5,000 square feet of retail uses, two residential clubhouses, and two ancillary support buildings. Building exteriors would incorporate combinations of stucco wall colors in a variety of light and neutral shades to evoke a modern aesthetic. The communal buildings would incorporate distinctive accent colors and materials. Compared to existing conditions, the proposed project would increase density at the project site. There are 159 existing trees on the project site. It is anticipated that 133 trees, including 16 heritage trees, would need to be removed for project construction. Upon project buildout, 126 trees would be provided on the site, consisting of 26 existing trees and 100 new trees. The project would incorporate a landscape plan to compensate for the removal of trees and vegetation and enhance the development. The landscape plan would include planting on-site trees to replace trees removed during construction, in accordance with the City Tree Ordinance (Chapter 17-24). Based on the above, the proposed project has the potential to alter the visual character and quality of the project site and vicinity, which could result in degradation of the community's aesthetic character. However, the proposed project would be subject to the same General Plan policies and City design guidelines as development under the North Station Area Plan. Therefore, the impact would be ***less than significant***, consistent with the conclusion in the North Station Area Plan EIR.

Light and Glare

The analysis of impacts related to light and glare is included in the North Station Area Plan EIR as Impact 3.1.4 (pages 3.1-12 and 3.1-13). Any new source of substantial project-related light or glare that would adversely affect daytime or nighttime views in the area would be regarded as a significant environmental impact. The City prescribed Mitigation Measure 3.1.4 in the North Station Area Plan EIR, which requires the use of building materials that reduce glare for structures greater than three stories tall. The North Station Area Plan EIR concluded that impacts would be less than significant with mitigation.

Lighting for the proposed project would include wall-mounted units on the exterior of the buildings. Lights would also be provided at building entrances and in open space areas. Exterior pole-mounted fixtures with a maximum luminaire height of 14 feet would be provided in vehicular circulation areas. Decorative low-level pedestrian lighting would be provided along pedestrian pathways. Free-standing monument-type signs would be provided at primary points of entry. All exterior lighting and signage would conform to the City Zoning Code, Section 20-30.080, Outdoor Lighting, and Section 20-38.050, General Requirements for All Signs. The maximum building height would be three stories, or approximately 40 feet.⁵ Therefore, the proposed project would be required to implement Mitigation Measure 3.1.4. The impact would be ***less than significant with implementation of the North Station Area Plan EIR mitigation measure***, consistent with the conclusion in the North Station Area Plan EIR.

⁵ The building height is measured to the top of rooftop appurtenances.

Cumulative Impacts

The analysis of cumulative impacts related to aesthetics and visual resources is included in the North Station Area Plan EIR as Impact 3.1.5 (page 3.1-13). The North Station Area Plan EIR concluded that implementation of the North Station Area Plan would not result in a cumulatively considerable contribution to a significant impact.

As evaluated above, no new impacts have been identified for the proposed project. Therefore, when combined with the cumulative development evaluated in the North Area Station Plan EIR, no new cumulative impacts would occur. Although new cumulative impacts could occur when combined with impacts from cumulative development not evaluated in the North Area Station Plan EIR, there are no projects in the planning area for the North Station Area Plan that would be inconsistent with the land use designation established under the General Plan and zoning code or that were otherwise not anticipated in the North Area Station Plan EIR. Thus, the proposed project would not result in a significant cumulative impact. Cumulative impacts would be *less than significant*.

Conclusion

With regard to aesthetics and visual resources, the following findings can be made:

1. There are no changes to the project or new circumstances involving new significant impacts or substantially more severe impacts than what was anticipated in the North Station Area Plan EIR.
2. No new information of substantial importance that was not discussed in the North Station Area Plan EIR has been identified that would require new analysis.
3. Implementation of the mitigation measures and/or development policies and standards contained in the North Station Area Plan EIR would reduce project impacts to less-than-significant levels.

Air Quality

Issues (and Supporting Information Sources)	Where in the Prior EIR is This Topic Discussed?	Did the Prior EIR Identify a Significant Impact and Mitigation Measures for This Topic?	Do Any Prior EIR Mitigation Measures Apply to the Project for This Topic?	Are There Any Changes to the Project or New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Is There Any New Information of Substantial Importance Requiring New Analysis?
An air quality impact is considered significant if the project would:					
1) Conflict with or obstruct implementation of the applicable air quality plan.	Construction Impact 3.3.1, pp. 3.3-21 to 3.3-23 Operation Impact 3.3.2, pp. 3.3-23 to 3.3-29	Construction: Yes, MM 3.3.1 Operation: Yes, but no MM available	Construction: Yes, MM 3.3.1 Operation: No	No	No
2) Violate any air quality standard or contribute substantially to an existing or projected air quality violation.	Construction Impact 3.3.1, pp. 3.3-21 to 3.3-23 Operation Impact 3.3.2, pp. 3.3-23 to 3.3-29	Construction: Yes, MM 3.3.1 Operation: Yes, but no MM available	Yes	No	No
3) Result in a cumulatively considerable net increase in any criteria pollutant for which the project region is in nonattainment status under an applicable federal or state ambient air quality standard (including a release of emissions that exceed quantitative thresholds for ozone precursors).	Impact 3.3.6, pp. 3.3-39 and 3.3-40	Yes, but no MM available	No	No	No
4) Expose sensitive receptors to substantial pollutant concentrations.	Impact 3.3.5, pp. 3.3-29 to 3.3-37	Yes, MM 3.3.3	Yes, MM 3.3.3	No	No
5) Create objectionable odors affecting a substantial number of people.	Impact 3.3.4, pp. 3.3-37 and 3.3-38	No	No	No	No

Discussion

No substantial change in the environmental setting related to air quality has occurred since certification of the North Station Area Plan EIR, as described in Section 3.3, *Air Quality*, of the North Station Area Plan EIR.

Short-Term Construction-Generated Emissions of Criteria Air Pollutants and Precursors

The analysis of impacts related to short-term construction-generated emissions of criteria air pollutants and precursors is included in the North Station Area Plan EIR as Impact 3.3.1 (pages 3.3-21 to 3.3-23). The North Station Area Plan EIR analyzed the potential for construction activities within the area for the North Station Area Plan to conflict with or obstruct implementation of the applicable air quality plan or contribute substantially to an existing or projected air quality violation. The City found that the North Station Area Plan did not incorporate best management practices (BMPs) recommended by the Bay Area Air Quality Management District (BAAQMD), the omission of which may result in short-term increases in criteria air pollutants that could conflict with or obstruct implementation of the applicable air quality plan (Impact 3.3.1). The City prescribed Mitigation Measure 3.3.1 in the North Station Area Plan EIR, which would implement BMPs to minimize construction emissions, thereby reducing them to less-than-significant levels. The North Station Area Plan EIR concluded that, because implementation of Mitigation Measure 3.3.1 would substantially reduce construction-related emissions and BAAQMD Regulation 11, Rule 2, would reduce short-term construction emissions during demolition, construction emissions associated with future development under the North Station Area Plan would result in a less-than-significant impact with mitigation.

As with anticipated development pursuant to the North Station Area Plan and analyzed in the North Station Area Plan EIR, the proposed project may result in short-term increases in criteria air pollutants that could conflict with or obstruct implementation of the applicable air quality plan. The proposed project would involve construction activities similar to those expected with development under the North Station Area Plan and assumed in the North Station Area Plan EIR and have a footprint similar to that of development under the North Station Area Plan. As a result, short-term construction emissions associated with the proposed project would be similar to those expected to result from development under the North Station Area Plan. As determined in the North Station Area Plan EIR, implementation of Mitigation Measure 3.3.1 would effectively minimize short-term construction emissions generated by the proposed project, reducing them to levels below the applicable significance threshold. Mitigation Measure 3.3.1 would thus remain relevant and effective mitigation for reducing construction emissions to less-than-significant levels and ensuring that the proposed project would not conflict with or obstruct implementation of the applicable air quality plan. Therefore, the impact would be ***less than significant with implementation of the North Station Area Plan EIR mitigation measure***, consistent with the conclusion in the North Station Area Plan EIR.

Long Term Operational Emissions of Criteria Air Pollutants and Precursors

The analysis of impacts related to long term operational emissions of criteria air pollutants and precursors is included in the North Station Area Plan EIR as Impact 3.3.2 (pages 3.3-23 to 3.3-29). The North Station Area Plan EIR analyzed the potential for operational emissions resulting from buildout of the North Station Area Plan to conflict with or obstruct implementation of the applicable air quality plan or contribute substantially to an existing or projected air quality violation. The City found that implementation of City of Santa Rosa General Plan 2035 (General Plan) policies would reduce air quality impacts associated with development of the North Station Area Plan and that the inclusion of additional

policies proposed in the North Station Area Plan would ensure further consistency with BAAQMD's Clean Air Plan control strategies. Nonetheless, the City concluded that, although the proposed North Station Area Plan would not result in an increase in vehicle miles traveled (VMT) per person, overall gross VMT would increase by more than the rate of population growth. As such, the increase in VMT at buildout, which would exceed population growth, would result in a significant and unavoidable impact according to the North Station Area Plan EIR.

The proposed project would result in a level of development at the project site similar to that analyzed in the North Station Area Plan EIR and have a footprint similar to that of development under the North Station Area Plan. The North Station Area Plan anticipated the development of up to 2,421 new multi-family residential units out of the 2,941 total new dwelling units within the area for the North Station Area Plan. Given the allowable residential density under the General Plan's Medium-High Density Residential land use designation, the project site was anticipated to accommodate between 628 and 1,047 multi-family dwelling units under the North Station Area Plan. This would account for approximately 26 to 43 percent of the total number of anticipated new multi-family residential units and approximately 21 to 36 percent of the total number of new dwelling units that would be developed pursuant to the North Station Area Plan. By proposing up to 772 dwelling units, the project would be consistent with the level of development assumed for the project site, as analyzed in the North Station Area Plan EIR. As a result, the project would not result in a substantially more severe increase in operational emissions throughout the area for the North Station Area Plan than was anticipated to occur in the North Station Area Plan EIR. Furthermore, as it relates to City and regional goals and plans regarding air quality, the proposed project would further the City's intent to use infill development to add residential density to an area that is proximate to a major transit stop and well within Santa Rosa's urban core. Therefore, it is anticipated that the project would result in lower VMT and associated mobile emissions compared with residential development farther from the city center. The impact would be ***significant and unavoidable (and no mitigation measures are available to reduce or avoid the impact), but no more severe than the significant and unavoidable impact identified in the North Station Area Plan EIR.***

Exposure of Sensitive Receptors to Localized Concentrations of Hazardous Air Pollutants

The analysis of impacts related to exposure of sensitive receptors to localized concentrations of hazardous air pollutants is included in the North Station Area Plan EIR as Impact 3.3.3 (pages 3.3-29 to 3.3-37). The analysis of impacts in the North Station Area Plan EIR related to the exposure of sensitive receptors to substantial pollutant concentrations evaluated whether development pursuant to the North Station Area Plan alone or in combination with cumulative development would expose sensitive receptors to substantial concentrations of toxic air contaminants (TACs) and particulate with a diameter of 2.5 micrometers or less (PM_{2.5}). The North Station Area Plan EIR found that future development could increase the exposure of sensitive land uses to pollutant concentrations that would exceed applicable BAAQMD significance thresholds, resulting in a potentially significant impact. The City prescribed Mitigation Measure 3.3.3 in the North Station Area Plan EIR, which requires project-specific analyses for future development projects within the planning area that would site new sensitive land uses near existing sources of TACs and PM_{2.5}, such as major permitted stationary sources or U.S. 101, or result in new sources of TACs or PM_{2.5} near sensitive land uses, such as non-permitted sources like loading docks with diesel equipment and vehicles. With implementation of Mitigation Measure 3.3.3, the North Station Area Plan EIR concluded that health risk impacts associated with development pursuant to the North Station Area Plan would be less than significant with mitigation.

The proposed project would not include the addition of major stationary sources of TACs or PM_{2.5}. No loading docks with diesel vehicles or major types of diesel-powered equipment would be used at the project site. Because the proposed project would be consistent with the North Station Area Plan and would not include the addition of major stationary sources of TACs or PM_{2.5}, it would not be anticipated to result in potentially significant impacts related to the exposure of off-site sensitive receptors to localized concentrations of hazardous air pollutants generated by the project. However, the proposed project would site new sensitive land uses within 1,000 feet of a major permitted stationary source and within the overlay zone of U.S. 101. As a result, pursuant to Mitigation Measure 3.3.3, health risks at future on-site sensitive receptors resulting from existing sources of TACs or PM_{2.5} within 1,000 feet of the project site have been evaluated for the proposed project. BAAQMD provides several tools for evaluating health risks on sensitive receptors from background sources of pollution. The analysis for the proposed project relies on BAAQMD's tools; therefore, a full project-specific analysis was not required. There is one permitted stationary source within 1,000 feet of the project site. BAAQMD's inventory of stationary health risks was used to estimate health risks from this existing permitted facility. For roadway and railway sources, geographic information system (GIS) raster files provided by BAAQMD were used to estimate health risks and PM_{2.5} concentrations from roadway and railway emissions within 1,000 feet of the project site.⁶

Existing background health risk values were compared to the BAAQMD thresholds applicable to health risks from all local sources within 1,000 feet of the project site, consistent with the BAAQMD guidance applied in the North Station Area Plan EIR. The BAAQMD CEQA Air Quality Guidelines recommend the use of the cumulative-level thresholds for evaluating impacts on new sensitive receptors because "cumulative thresholds for receptors are designed to account for the effects of all sources within the defined area."⁷ Table 4-2 shows the health risks from existing stationary, roadway, and railway sources within 1,000 feet of the project site for the maximally affected receptor. Appendix A to this checklist provides additional data on individual background contributions from existing sources for the analysis of health risks.

Table 4-2. Health Risks from Existing Sources for Future On-site Sensitive Receptors for the Proposed Project

Source	Cancer Risk	Chronic Hazard	PM _{2.5} Concentration
Road	35	0.1	0.4
Rail	< 1	< 0.1	< 0.1
Stationary	< 1	< 0.1	< 0.1
Total	35	0.1	0.4
BAAQMD Cumulative-Level Threshold	100	10.0	0.8
<i>Exceed?</i>	<i>No</i>	<i>No</i>	<i>No</i>

As shown in Table 4-2, health risks associated with the exposure of new sensitive receptors to existing stationary, roadway, and railway sources would not exceed the applicable thresholds established by BAAQMD for evaluating impacts on new sensitive receptors. As determined in the North Station Area Plan EIR, implementation of Mitigation Measure 3.3.3 for projects with health risks or PM_{2.5}

⁶ Bay Area Air Quality Management District. 2022. *Health Risk Screening and Modeling*. Available: <https://www.baaqmd.gov/plans-and-climate/california-environmental-quality-act-ceqa/ceqa-tools/health-risk-screening-and-modeling>. Accessed: November 30, 2023.

⁷ Bay Area Air Quality Management District. 2017. *California Environmental Quality Act Air Quality Guidelines*. May. Available: https://www.baaqmd.gov/~media/files/planning-and-research/ceqa/ceqa_guidelines_may2017-pdf.pdf?la=en. Accessed: November 30, 2023.

concentrations above BAAQMD thresholds would effectively reduce health risks associated with siting new sensitive uses near existing sources of TACs and PM_{2.5} and reduce them to levels below the applicable significance thresholds. The reduction would occur from the building design measures prescribed in Mitigation Measure 3.3.3, which are intended to reduce the exposure of receptors to pollutants. Pursuant to Mitigation Measure 3.3.3, health risks at future on-site sensitive receptors resulting from existing sources of TACs or PM_{2.5} within 1,000 feet of the project site have been evaluated for the proposed project. However, as shown in Table 4-2, the proposed project would not expose new sensitive receptors to health risks or PM_{2.5} concentrations greater than the BAAQMD thresholds prior to implementation of the prescribed building design measures in Mitigation Measure 3.3.3. Therefore, implementation of the building design measures in Mitigation Measure 3.3.3 are not required. Based on the project-specific analysis prepared for the project (as required by Mitigation Measure 3.3.3) and discussed above, impacts associated with exposure of sensitive receptors to substantial pollutant concentrations would be ***less than significant with implementation of the North Station Area Plan EIR mitigation measure***, consistent with the conclusion in the North Station Area Plan EIR.

Exposure of Sensitive Receptors to Odorous Emissions

The analysis of impacts related to exposure of sensitive receptors to odorous emissions is included in the North Station Area Plan EIR as Impact 3.3.4 (pages 3.3-37 to 3.3-38). The North Station Area Plan EIR concluded impacts would be less than significant.

The general size and magnitude of development under the proposed project would be consistent with the anticipated under the North Station Area Plan. Although construction methods and materials used in the construction process may result in temporary odors, as described in the North Station Area Plan EIR, because construction-related odors would be intermittent and temporary and would disperse rapidly with distance from the source, construction-related odors would not result in the frequent exposure of a substantial number of individuals to objectionable odors. Because the level and duration of project construction would be similar to that anticipated with development on the project site pursuant to the North Station Area Plan, the level of short-term exposure to odors for sensitive receptors during project construction would be similar and would not result in a new significant impact or substantially more severe significant impact related to short-term exposure to odors. Regarding long-term sources of odors, the North Station Area Plan EIR concluded that development pursuant to the North Station Area Plan would not be considered a major source of odorous emissions. The proposed project would be consistent with the level of development on the project site assumed in the North Station Area Plan EIR and would not include a new major source of odorous emissions. Therefore, the impact would be ***less than significant***, consistent with the conclusion in the North Station Area Plan EIR.

Cumulative Impacts

The analysis of cumulative impacts related to air quality is included in the North Station Area Plan EIR as Impact 3.3.6 (pages 3.3-39 and 3.3-40). The North Station Area Plan EIR concluded that implementation of the policies outlined in the City of Santa Rosa General Plan 2035 and North Station Area Plan aimed at reducing air quality impacts would help reduce the North Station Area Plan's contribution to cumulative air quality impacts. However, the City concluded that implementation of the policies would not be enough to reduce impacts to less-than-significant levels and that the rate of increase in VMT would continue to exceed the rate of population increase at buildout. As a result, the North Station Area Plan EIR concluded that the North Station Area Plan's contribution to cumulative impacts would be cumulatively considerable, resulting in a significant and unavoidable impact.

As evaluated above, no new impacts have been identified for the proposed project. Therefore, when combined with the cumulative development evaluated in the North Station Area Plan EIR, no new cumulative impacts would occur. Although new cumulative impacts could occur when combined with impacts from cumulative development not evaluated in the North Station Area Plan EIR, there are no projects in the planning area for the North Station Area Plan that would be inconsistent with the land use designation established under the General Plan and zoning code or projects that were otherwise not anticipated in the North Station Area Plan EIR. Thus, cumulative impacts would be ***significant and unavoidable with implementation of the North Station Area Plan EIR mitigation measure but no more severe than the significant and unavoidable impact identified in the North Station Area Plan EIR.***

Conclusion

With regard to air quality, the following findings can be made:

1. There are no changes to the project or new circumstances involving new significant impacts or substantially more severe impacts than what was anticipated in the North Station Area Plan EIR.
2. No new information of substantial importance that was not discussed in the North Station Area Plan EIR has been identified that would require new analysis.
3. Even with implementation of the mitigation measures and/or development policies and standards contained in the North Station Area Plan EIR, impacts would be significant and unavoidable but no more severe than the impacts identified in the North Station Area Plan EIR.

Biological Resources

Issues (and Supporting Information Sources)	Where in the Prior EIR is This Topic Discussed?	Did the Prior EIR Identify a Significant Impact and Mitigation Measures for This Topic?	Do Any Prior EIR Mitigation Measures Apply to the Project for This Topic?	Are There Any Changes to the Project or New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Is There Any New Information of Substantial Importance Requiring New Analysis?
An impact on biological resources is considered significant if the project would:					
1) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status in local or regional plans, policies, or regulations or by CDFW and USFWS.	Impact 3.4-1, pp. 3.4-10 and 3.4-11	Yes, MM 3.4.1	Yes, MM 3.4.1	No	No
2) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by CDFW or USFWS.	Impact 3.4.2, pp. 3.4-11 and 3.4-12	Yes, MM 3.4.2	Yes, MM 3.4.2	No	No
3) Have a substantial adverse effect on federally protected wetlands, as defined by Section 404 of the Clean Water Act (including, but not limited to, marshes, vernal pools, coastal areas, etc.), through direct removal, filling, hydrological interruption, or other means.	Impact 3.4.2, pp. 3.4-11 and 3.4-12	Yes, MM 3.4.2	Yes, MM 3.4.2	No	No
4) Interfere substantially with the movement of any native resident or migratory fish or wildlife species, or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.	Impact 3.4-1, pp. 3.4-10 and 3.4-11	Yes, MM 3.4.1	Yes, MM 3.4.1	No	No

Issues (and Supporting Information Sources)	Where in the Prior EIR is This Topic Discussed?	Did the Prior EIR Identify a Significant Impact and Mitigation Measures for This Topic?	Do Any Prior EIR Mitigation Measures Apply to the Project for This Topic?	Are There Any Changes to the Project or New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Is There Any New Information of Substantial Importance Requiring New Analysis?
5) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.	Impact 3.4.3, pp. 3.4-12 and 3.4-13	No	No	No	No
6) Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan.	Impact 3.4.3, pp. 3.4-12 and 3.4-13	No	No	No	No

Discussion

No substantial change in the environmental setting related to biological resources has occurred since certification of the North Station Area Plan EIR, as described in Section 3.4, *Biological Resources*, of the North Station Area Plan EIR.

Special-status Species or Their Habitat or Movement

The analysis of impacts on special-status species or their habitat or movement is included in the North Station Area Plan EIR as Impact 3.4.1 (pages 3.4-10 and 3.4-11). No wildlife movement corridors have been identified in the planning area. Redevelopment of some parcels in the planning area could affect wildlife habitat. Specifically, existing structures, including buildings and bridges, can provide habitat to bat and bird species, some of which may be special-status species or, in the case of birds, protected by the Migratory Bird Treaty Act. Disturbance of these habitats by redevelopment activities is considered a potentially significant impact. The City prescribed Mitigation Measure 3.4.1 in the North Station Area Plan EIR, which requires a plan to monitor nesting birds or bats during construction be submitted to the U.S. Fish and Wildlife Service and California Department of Fish and Wildlife for review and approval if there is potential for destruction of a nest or substantial disturbance to nesting birds or bats due to construction activities. In addition, pre-construction surveys must be conducted if vegetation, buildings, or bridges that potentially provide nesting sites are to be removed. The North Station Area Plan EIR concluded that impacts on special-status species or their habitat or movement due to redevelopment activities would be less than significant with mitigation.

Existing on-site landscaping is limited to shrubs and grasses. Approximately 99 percent of the project site is covered with pervious surfaces; 1 percent is covered with impervious surfaces. A botanical survey was conducted for the project site in 2022 by Dudek.⁸ According to the botanical survey, the project site is dominated by highly disturbed California annual grassland and urban/developed land cover. Three seasonal wetlands make up approximately 0.45 acre of the site. The grassland community was dominated by nonnative grasses, medusa head (*Elymus caput-medusae*), wild oat (*Avena barbata*), soft brome (*Bromus hordeaceus*), and Harding grass (*Phalaris aquatica*); it also included common forbs such as salsify (*Tragopogon porrifolius*) and cultivated radish (*Raphanus sativus*). Sporadic thickets of Himalayan blackberry (*Rubus armeniacus*) and poison oak (*Toxicodendron diversilobum*) occur within the grassland, in addition to stray stone fruit (*Prunus* spp.) and walnut (*Juglans* spp.) trees. Twelve special-status plant species have varied potential to occur on the site, based on habitat suitability on-site and known occurrences in the region. According to the botanical survey, none of these species, nor any other special-status plant species, were identified during the botanical surveys conducted in March 2021, April 2021, July 2021, and April 2022. As with other development in the planning area, the proposed project would comply with General Plan Policy OSC-D-1, which requires the conservation of wetlands, vernal pools, wildlife ecosystems, rare plant habitats, and waterways, and General Plan Policies OSC-H-1 and OSC-H-2, which require conservation of trees.

The proposed project includes the demolition of existing single-family residential units and associated structures. In addition, there are 159 existing trees on the project site. It is anticipated that 133 trees, including 16 heritage trees, would need to be removed for project construction. If nests are present on-

⁸ Dudek. 2022. *Botanical Survey Results for the Alta Santa Rosa Project – Two Adjacent Parcels (APNs 036-111-011 and 036-111-002) in the City of Santa Rosa, California*. Prepared for PR II/Wood Santa Rosa, LLC. June.

site or in the surrounding area and eggs, nestlings, or nesting individuals are harmed or killed during vegetation removal or substantially affected by noise during construction or nighttime lighting during operation, a significant impact could occur. Therefore, the proposed project would be required to implement Mitigation Measure 3.4.1 to ensure that bird and bat nesting habitats are protected from demolition activities. In addition, the potential exists for the proposed project to result in indirect impacts on aquatic habitats because of impacts on water quality. However, there would be no indirect impacts on aquatic habitats because water quality would be protected through compliance with local and state regulations. The impact would be ***less than significant with implementation of the North Station Area Plan EIR mitigation measure***, consistent with the conclusion in the North Station Area Plan EIR.

Wetland or Riparian Habitats

The analysis of impacts on wetlands or riparian habitats is included in the North Station Area Plan EIR as Impact 3.4.2 (pages 3.4-11 and 3.4-12). Development could result in fill that could affect seasonal wetlands that may be present in the planning area. Construction activities along or near Paulin Creek or Steele Creek could result in effects on wetlands or riparian habitats along these creeks. Application of appropriate General Plan policies, as well as appropriate provisions of the Santa Rosa Citywide Creek Master Plan and Santa Rosa City Code, would minimize impacts on wetlands or riparian habitat; however, this is considered a potentially significant impact. The City prescribed Mitigation Measure 3.4.2 in the North Station Area Plan EIR, which requires a formal wetland delineation for areas that will be permanently or temporarily affected; no net loss of waters of the United States would occur through impact avoidance, impact minimization, and/or compensatory mitigation. The North Station Area Plan EIR concluded that impacts on wetlands or riparian habitats would be less than significant with mitigation.

Pursuant to Mitigation Measure 3.4.2, a preliminary delineation of potentially jurisdictional aquatic resources was conducted for the project site in 2022 by Dudek.⁹ According to the preliminary delineation of potentially jurisdictional aquatic resources, there are no aquatic resources within the review area that are anticipated to meet the criteria for jurisdictional waters of the United States. All aquatic resources within the project site (approximately 0.45 acre) are anticipated to meet the State Water Resources Control Board definition of a wetland and therefore are considered waters of the state and subject to Regional Water Quality Control Board jurisdiction. The U.S. Army Corps of Engineers prepared a formal verification memorandum that recommended the 0.45-acre area as waters of the state and not waters of the United States; the memorandum is currently under review by the U.S. Environmental Protection Agency. As required by Mitigation Measure 3.4.2, the project sponsor would coordinate with the City to provide mitigation through impact avoidance, impact minimization, and/or compensatory mitigation for the impact. In addition, the potential exists for the proposed project to result in indirect impacts on federally protected wetlands or other jurisdictional waters because of impacts on water quality. However, there would be no indirect impacts on jurisdictional waters or wetlands because water quality would be protected through compliance with local and state regulations. Therefore, the impact would be ***less than significant with implementation of the North Station Area Plan EIR mitigation measure***, consistent with the conclusion in the North Station Area Plan EIR.

⁹ Dudek. 2022. *Aquatic Resources Delineation Report: Lance Drive Parcels in the City of Santa Rosa, Sonoma County, California* (APNs 036-111-002, 036-111-009, 036-111-010, 036-111-011, and 036-111-016). Prepared for PR II/Wood Santa Rosa, LLC. June.

Conflict with Policies, Ordinances, or Adopted Conservation Plans

The analysis of impacts related to conflict with policies, ordinances, or adopted conservation plans is included in the North Station Area Plan EIR as Impact 3.4.3 (pages 3.4-12 and 3.4-13). There are no adopted habitat conservation plans that cover the planning area. The North Station Area Plan would support the goals and policies of the General Plan, including those related to the protection of biological resources. Development would be subject to applicable General Plan policies, Santa Rosa Citywide Creek Master Plan policies, and the City Zoning Code. The North Station Area Plan EIR concluded that there would be no impact related to a conflict with policies, ordinances, or adopted conservation plans.

There are 159 existing trees on the project site. It is anticipated that 133 trees, including 16 heritage trees, would need to be removed for project construction. Upon project buildout, 126 trees would be provided on the site, consisting of 26 existing trees and 100 new trees. The project would incorporate a landscape plan to compensate for the removal of trees and vegetation and enhance development. The landscape plan would include planting on-site trees to replace trees removed during construction, in accordance with the City Tree Ordinance (Chapter 17-24). The proposed project would not conflict with any local policies or ordinances that protect biological resources. In addition, the project site is not part of, or near, an area covered by an adopted or proposed habitat conservation plan or natural community conservation plan or any other local, regional, or state habitat conservation plan. Therefore, there would be ***no impact***, consistent with the conclusion in the North Station Area Plan EIR.

Cumulative Impacts

The analysis of cumulative impacts related to biological resources is included in the North Station Area Plan EIR as Impact 3.4.4 (page 3.4-13). The North Station Area Plan EIR concluded that implementation of the North Station Area Plan would not result in a cumulatively considerable contribution to a significant impact.

As evaluated above, no new impacts have been identified for the proposed project. Therefore, when combined with the cumulative development evaluated in the North Area Station Plan EIR, no new cumulative impacts would occur. Although new cumulative impacts could occur when combined with impacts from cumulative development not evaluated in the North Area Station Plan EIR, there are no projects in the planning area for the North Station Area Plan that would be inconsistent with the land use designation established under the General Plan and zoning code or that were otherwise not anticipated in the North Area Station Plan EIR. Thus, the proposed project would not result in a significant cumulative impact. Cumulative impacts would be ***less than significant***.

Conclusion

With regard to biological resources, the following findings can be made:

1. There are no changes to the project or new circumstances involving new significant impacts or substantially more severe impacts than what was anticipated in the North Station Area Plan EIR.
2. No new information of substantial importance that was not discussed in the North Station Area Plan EIR has been identified that would require new analysis.
3. Implementation of the mitigation measures and/or development policies and standards contained in the North Station Area Plan EIR would reduce project impacts to less-than-significant levels.

Cultural and Paleontological Resources (Built-Environment Resources)

Issues (and Supporting Information Sources)	Where in the Prior EIR is This Topic Discussed?	Did the Prior EIR Identify a Significant Impact and Mitigation Measures for This Topic?	Do Any Prior EIR Mitigation Measures Apply to the Project for This Topic?	Are There Any Changes to the Project or New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Is There Any New Information of Substantial Importance Requiring New Analysis?
Cultural resource impacts would be considered significant if implementation of the project under consideration would result in any of the following:					
1) Cause a substantial adverse change in the significance of a historical resource, as defined in Public Resources Code Section 21084.1 and CEQA Guidelines Section 15064.5.	Impact 3.5.1, pp. 3.5-12 and 3.5-13	No	No	No	No

Impacts related to archeological resources, paleontological resources, and human remains are briefly evaluated under *Impacts Not Evaluated Further in This Checklist*, above. Therefore, these environmental topics are not included in the discussion below.

Discussion

No substantial change in the environmental setting related to built-environment resources has occurred since certification of the North Station Area Plan EIR, as described in Section 3.5, *Cultural and Paleontological Resources*, of the North Station Area Plan EIR.

The analysis of impacts on built-environment historical resources is included in the North Station Area Plan EIR as Impact 3.5.1 (pages 3.5-12 and 3.5-13). The planning area contains properties that are listed in the City's Historic Properties Inventory and these properties are considered historical resources for the purposes of CEQA. Development and redevelopment within the planning area could affect such properties, either through modifications that affect the character of historical resources or through construction activities associated with said development and redevelopment. Adherence to the Secretary of the Interior's Standards for Rehabilitation is required by General Plan Policy HP-B-1. In addition, the City Preservation Ordinance of 1988 and General Plan Policies HP-B-2 through HP-B-9 are designed to preserve and enhance Santa Rosa's historic properties and neighborhoods. The North Station Area Plan EIR concluded this impact was less than significant because existing regulations, policies, and standards would reduce potential impacts.

Development under the proposed project would not differ substantially from the development anticipated to occur on the project site under the North Station Area Plan EIR. In regard to the historic built environment, both the North Station Area Plan EIR and proposed project anticipated the demolition of buildings and structures on the project site. However, none of the historical resources addressed in the North Station Area Plan EIR are located on the project site. Pursuant to the North Station Area Plan EIR, the proposed project underwent project-specific environmental review (provided below), in compliance with CEQA Guidelines Section 15064.5, in order for the City to determine whether a building or structure that was more than 45 years of age at the time of application was a historic resource and take appropriate action, such as requiring additional site-specific or project-specific measures to reduce any potential impacts.

In August 2022, ICF evaluated the historic-age built-environment resources at 1601 and 1696 Lance Drive for historical significance, with consideration of the National Register of Historic Places (NRHP) and California Register of Historical Resources (CRHR) designation criteria and in accordance with Section 15064.5(a)(2)–(3) of the CEQA Guidelines.^{10,11} Appendix B to this checklist includes the evaluation of historic-age built-environment resources. According to the project sponsor, two historic-age buildings and structures on the project site were demolished subsequent to ICF's evaluation in August 2022. When ICF prepared the evaluation, two parcels on the project site contained historic-age buildings and structures, which were constructed at undetermined dates between 1911 and 1952 (i.e., more than 45 years ago). At the time of the evaluation in August 2022, the parcel associated with the 1601 Lance Drive address was developed with a single-family residence, along with a barn, garage, pump house, shed, various outbuildings, and the remnants of previous buildings. Also at the time of the

¹⁰ Felicetti, Nicole (ICF). 2022a. *1601 Lance Drive*. Department of Parks and Recreation series 523 form. Prepared for Wood Partners. August.

¹¹ Felicetti, Nicole (ICF). 2022b. *1696 Lance Drive*. Department of Parks and Recreation series 523 form. Prepared for Wood Partners. August.

evaluation in August 2022, the parcel associated with the 1696 Lance Drive address was developed with a large wooden barn, along with a small wooden outbuilding, a small covered structure, and the remnants of a rectangular foundation. ICF's evaluation concluded that none of the extant buildings or structures on the project site should be considered historical resources for the purposes of CEQA. Therefore, impacts would be ***less than significant***, consistent with the conclusion in the North Station Area Plan EIR.

Cumulative Impacts

The analysis of cumulative impacts related to built-environment resources is included in the North Station Area Plan EIR as Impact 3.5.5 (page 3.5-15). The North Station Area Plan EIR concluded that implementation of the North Station Area Plan would not result in a cumulatively considerable contribution to a significant impact.

As evaluated above, no new impacts have been identified for the proposed project. Therefore, when combined with the cumulative development evaluated in the North Station Area Plan EIR, no new cumulative impacts would occur. Although new cumulative impacts could occur when combined with impacts from cumulative development not evaluated in the North Station Area Plan EIR, there are no projects in the planning area for the North Station Area Plan that would be inconsistent with the land use designation established under the General Plan and zoning code or projects that were otherwise not anticipated in the North Station Area Plan EIR. Thus, the proposed project would not result in a significant cumulative impact. Cumulative impacts would be ***less than significant***.

Conclusion

With regard to built-environment resources, the following findings can be made:

1. There are no changes to the project or new circumstances involving new significant impacts or substantially more severe impacts than what was anticipated in the North Station Area Plan EIR.
2. No new information of substantial importance that was not discussed in the North Station Area Plan EIR has been identified that would require new analysis.
3. Implementation of the mitigation measures and/or development policies and standards contained in the North Station Area Plan EIR would reduce project impacts to less-than-significant levels.

Hazardous Materials/Human Health

Issues (and Supporting Information Sources)	Where in the Prior EIR is This Topic Discussed?	Did the Prior EIR Identify a Significant Impact and Mitigation Measures for This Topic?	Do Any Prior EIR Mitigation Measures Apply to the Project for This Topic?	Are There Any Changes to the Project or New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Is There Any New Information of Substantial Importance Requiring New Analysis?
An impact related to hazardous materials and human health is considered significant if the project would:					
1) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.	Impact 3.7.1, p. 3.7-10	No	No	No	No
2) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.	Impact 3.7.3, pp. 3.7-13 and 3.7-14	Yes, MM 3.7.3	No	No	No
3) Emit hazardous emissions or involve handling hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school.	Impact 3.7.4, p. 3.7-14	No	No	No	No
4) Be located on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, create a significant hazard to the public or the environment.	Impact 3.7.2, pp. 3.7-11 to 3.7-13	Yes, MM 3.7.2	No	No	No
5) For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, result in a safety hazard for people residing or working in the project area.	Impact 3.7.5, pp. 3.7-14 and 3.7-15	No	No	No	No

Issues (and Supporting Information Sources)	Where in the Prior EIR is This Topic Discussed?	Did the Prior EIR Identify a Significant Impact and Mitigation Measures for This Topic?	Do Any Prior EIR Mitigation Measures Apply to the Project for This Topic?	Are There Any Changes to the Project or New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Is There Any New Information of Substantial Importance Requiring New Analysis?
6) For a project within the vicinity of a private airstrip, result in a safety hazard for people residing or working in the project area.	Impact 3.7.5, pp. 3.7-14 and 3.7-15	No	No	No	No
7) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.	Impact 3.7.6, p. 3.7-15	No	No	No	No
8) Expose people or structures to a significant risk of loss, injury, or death involving fires, including in areas where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.	Impact 3.7.7, pp. 3.7-15 and 3.7-16	No	No	No	No

Discussion

No substantial change in the environmental setting related to hazardous materials and human health has occurred since certification of the North Station Area Plan EIR, as described in Section 3.7, *Hazardous Materials/Human Health*, of the North Station Area Plan EIR.

Transport, Use, and Storage of Hazardous Materials

The analysis of impacts related to the transport, use, and storage of hazardous materials is included in the North Station Area Plan EIR as Impact 3.7.1 (page 3.7-10). The North Station Area Plan EIR determined that an increase in population as a result of implementation of the North Station Area Plan could lead to additional use of hazardous materials, the construction of natural gas pipelines, storage of hazardous chemicals, additional use of landscaping and cleaning chemicals, and increased garbage or litter disposal, along with special disposal of hazardous waste. The North Station Area Plan EIR concluded that impacts associated with the handling of hazardous materials would be less than significant because development would comply with federal, state, and local regulations regarding use, transport, disposal, and cleanup (e.g., Hazardous Materials Transportation Act, 22 California Code of Regulations Sections 66001, et seq.). The proposed project would be required to comply with applicable federal, state, and local regulations regarding use, transport, disposal, and cleanup. Therefore, the impact would be ***less than significant***, consistent with the conclusion in the North Station Area Plan EIR.

Potential On-Site Hazards

The analysis of impacts related to on-site hazards is included in the North Station Area Plan EIR as Impact 3.7.2 (pages 3.7-11 and 3.7-12). Demolition activities in the planning area could result in exposure to asbestos, lead, and creosote; contaminated sites could result in exposure to affected soil and groundwater. The Santa Rosa Fire Department requires a Phase I environmental site assessment (Phase I ESA) for subdivisions, multi-family residential, and commercial developments where the project has not already gone through a Phase I as part of a previous subdivision or other review. Development of sites where contamination is discovered in a Phase I ESA is considered a potentially significant impact. The City prescribed Mitigation Measure 3.7.2 in the North Station Area Plan EIR, which requires remediation if contamination is discovered in a Phase I ESA. The North Station Area Plan EIR concluded impacts related to potential on-site hazards would be less than significant with mitigation.

As summarized below, two Phase I ESAs were conducted for the project site in 2021 and 2022 by Atlas Technical of San Ramon. The 2021 Phase I ESA encompassed the vast majority of the project site, with the exception of the residential parcels at 1680 and 1705 Lance Drive.¹² The June 2022 Phase I ESA was conducted to assess the aforementioned residential parcels.¹³

¹² Atlas. 2021. *Phase I Environmental Site Assessment: Former Dairy Ranch, Lance Drive and Guerneville Road, Santa Rosa, California, 95401*. Prepared for WP West Acquisitions, LLC. November.

¹³ Atlas. 2022. *Phase I Environmental Site Assessment: Residential Parcels, 1680 and 1705 Lance Drive, Santa Rosa, California, 95401*. Prepared for WP West Acquisitions, LLC. December.

2021 Phase I ESA for the Project Site

The addresses associated with the 2021 ESA were 1601 and 1607 Guerneville Road, 1601 and 1696 Lance Drive, and 1709 Lance Drive. The assessment did not identify any recognized environmental conditions (RECs) in connection with the project site; however, several business environmental risks¹⁴ (BERs) were identified. They included:

1. The historical use of the site (i.e., agricultural),
2. The potential costs associated with removing on-site abandoned septic systems,
3. The potential costs for properly abandoning on-site groundwater wells, and
4. The potential to encounter asbestos and lead-based paint on-site.

A soil management plan was recommended to address the potential of encountering affected soils. In addition, a hazardous building materials survey was recommended prior to demolition to identify potential risks associated with exposure to hazardous building materials. Depending upon the results of the survey, hazardous building materials would need to be managed according to all applicable laws and regulations.

2022 Phase I ESA for the Project Site

The addresses associated with the 2022 ESA were 1680 and 1705 Lance Drive. This assessment did not identify any RECs in connection with the project site; however, several BERs were identified. They included:

1. The potential for residual pesticides on-site and in neighboring soils,
2. The decommissioning of a water well and septic system at each residential site, and
3. The portions of the site that are designated as wetlands.

Proper decommissioning of water wells and septic systems during site redevelopment was recommended. In addition, it was noted that future development in areas designated as wetlands would require additional assessment prior to construction. Although it was *not* part of the recommendations found in the 2022 Phase I ESA, application of a soil management plan, as recommended in the 2021 Phase I ESA, would address the potential risk of exposure associated with contaminated soils.

2023 EDR Report for the Project Site

Because the environmental database information contained in the Phase I ESAs discussed above was more than 1 year old, and because environmental database information is dynamic and can change over time, ICF conducted a supplemental environmental database search using EDR Lightbox.¹⁵ In accordance with current American Society for Testing and Materials (ASTM) standard ASTM E1527-21, the environmental database review included an area up to 1 mile from the project site. The information provided in the environmental databases is used as an indicator. That is, it indicates whether the project site itself or

¹⁴ A business environmental risk, or BER, is a risk that can have a material environmental or environmentally driven impact on the business associated with the current or planned use on a parcel of commercial real estate. It is not necessarily limited to those environmental issues required to be investigated in this practice. Evaluation of BER issues may involve addressing one or more non-American Society for Testing and Materials (non-ASTM) scope considerations.

¹⁵ EDR. 2023. *The EDR Radius Map Report with Geocheck: Lance Drive, 1601 Lance Drive, Santa Rosa CA 95401*. October.

adjacent properties have the potential to negatively affect implementation of the proposed project. Multiple sites were identified with a history of releases to soil and groundwater and the potential to affect off-site locations, as identified in the following databases:

- CPS-SLIC – Cleanup Program Sites (also known as Site Cleanups and formerly known as Spills, Leaks, Investigations, and Cleanups).
- Cortese – These sites are designated by the State Water Resources Control Board, the Integrated Waste Board, and the Department of Toxic Substances Control as having on-site impacts.
- LUST – Leaking Underground Storage Tank. Sites with a history of releases associated with on-site underground storage tanks (USTs).
- EnviroStor – The Department of Toxic Substances Control’s EnviroStor database identifies sites that have known contamination or sites for which there may be reasons to investigate further.

Sites with a *Closed Case* or *No Further Action* status were considered sites with a low risk of exposure and are not evaluated any further in this checklist. Additional analysis of open and active cases was conducted to determine the likelihood of exposure to affected soils or groundwater for proposed project as a result of historical releases. A site’s location and distance in relation to the project site, the groundwater gradient (in some cases), and affected media and contaminants were considered in the additional analysis. The project site was not listed in any of the environmental databases reviewed. Furthermore, none of the off-site locations listed in the EDR Radius Map Report were considered a significant risk for the project site. The proposed project would not be required to implement Mitigation Measure 3.7.2 because contamination was not discovered in the Phase I ESAs prepared for the project site. Based on the above, the impact would be ***less than significant***. That level of impact would be less than what was concluded in the North Station Area Plan EIR; this impact is within the level of impact already considered in the North Station Area Plan EIR.

Accidental Release of Hazardous Materials

The analysis of impacts related to the accidental release of hazardous materials is included in the North Station Area Plan EIR as Impact 3.7.3 (pages 3.7-13 and 3.7-14). Existing local, state, and federal regulations regarding the appropriate legal use, storage, and disposal of hazardous materials associated with household and commercial uses (e.g., dry cleaners’ disposal of solvents) would ensure that impacts related to the potential for an accidental release of toxins into the environment would be less than significant. However, any business that would use large quantities of hazardous materials would be required to register and comply with the Hazardous Materials Business Plan, Hazardous Waste Generator Program, and Accidental Release Program. The City prescribed Mitigation Measure 3.7.3 in the North Station Area Plan EIR, which requires businesses that use large quantities of hazardous materials to register and comply with the Hazardous Materials Business Plan, Hazardous Waste Generator Program, and Accidental Release Program, as applicable. The North Station Area Plan EIR concluded that the potential for an accidental release of hazardous materials into the environment would be less than significant with mitigation.

The handling, use, and storage of hazardous materials as part of the proposed project would be conducted in accordance with all applicable federal, state, and local regulations, thereby minimizing potential exposure impacts. Demolition activities as part of the proposed project would also be conducted in accordance with all applicable requirements and policies. A hazardous building materials survey was recommended in the 2021 Phase I ESA (discussed above) prior to any demolition to identify potential risks associated with exposure to hazardous building materials. Any handling of hazardous

building materials prior to demolition would be conducted per the findings and recommendations found in the survey. Furthermore, implementation of a soil management plan during construction (also recommended in the 2021 Phase I ESA) would address potential impacts associated with exposure to contaminated soil. The proposed project would not be required to implement Mitigation Measure 3.7.3 because it would not include any businesses that would use large quantities of hazardous materials. Therefore, the impact would be ***less than significant***. That level of impact would be less than what was concluded in the North Station Area Plan EIR; this impact is within the level of impact already considered in the North Station Area Plan EIR.

School Hazards

The analysis of impacts related to the school hazards is included in the North Station Area Plan EIR as Impact 3.7.4 (page 3.7-14). Although there are several schools in the planning area, the North Station Area Plan EIR concluded that development under the North Station Area Plan would not include factories or other major emitters of hazardous emissions. Furthermore, development under the North Station Area Plan would eliminate some warehouse and industrial land uses in the area, resulting in less-than-significant impacts related to hazardous emissions or the handling of hazardous materials within 0.25 mile of schools. The proposed project would not include factories or other emitters of hazardous emissions. Therefore, the impact would be ***less than significant***, consistent with the conclusion in the North Station Area Plan EIR.

Airport Hazards

The analysis of impacts related to airport hazards is included in the North Station Area Plan EIR as Impact 3.7.5 (pages 3.7-14 and 3.7-15). The project site is not within an area covered by an airport land use plan, similar to the planning area. It is also not within 2 miles of a public airport or public use airport or near a private airstrip. Therefore, there would be ***no impact***, consistent with the conclusion in the North Station Area Plan EIR.

Emergency Plans

The analysis of impacts related to emergency plans is included in the North Station Area Plan EIR as Impact 3.7.6 (page 3.7-15). General Plan Policy NS-A-1 requires the City to maintain the Emergency Operations Plan as the City's disaster response plan and work with Sonoma County to update joint emergency response and disaster response plans. General Plan Policy NS-A-3 requires establishment of a community program that will train volunteers who will assist police, fire, and civil defense personnel during and after disasters. With implementation of General Plan policies, review of the construction plan by the Santa Rosa Fire Department, and adherence to other guidelines, the North Station Area Plan EIR concluded that impacts related to interference with an emergency access or evacuation plan would be less than significant. The proposed project would be subject to the same requirements (e.g., General Plan policies, construction plan review). It would also be reviewed by the City to ensure compliance with the Fire Code and Uniform Building Code requirements. Therefore, the impact would be ***less than significant***, consistent with the conclusion in the North Station Area Plan EIR.

Wildland Fires

The analysis of impacts related to wildland fires is included in the North Station Area Plan EIR as Impact 3.7.7 (pages 3.7-15 and 3.7-16). No wildlands exist on or in the vicinity of the planning area, including the project site, similar to conditions within the planning area. Therefore, there would be ***no impact***, consistent with the conclusion in the North Station Area Plan EIR.

Cumulative Impacts

The analysis of cumulative impacts related to hazardous materials and human health is included in the North Station Area Plan EIR as Impact 3.7.8 (pages 3.7-16 and 3.7-17). The North Station Area Plan EIR concluded that implementation of the North Station Area Plan would not result in a cumulatively considerable contribution to a significant impact.

As evaluated above, no new impacts have been identified for the proposed project. Therefore, when combined with the cumulative development evaluated in the North Area Station Plan EIR, no new cumulative impacts would occur. Although new cumulative impacts could occur when combined with impacts from cumulative development not evaluated in the North Area Station Plan EIR, there are no projects in the planning area for the North Station Area Plan that would be inconsistent with the land use designation established under the General Plan and zoning code or that were otherwise not anticipated in the North Area Station Plan EIR. Thus, the proposed project would not result in a significant cumulative impact. Cumulative impacts would be *less than significant*.

Conclusion

With regard to hazardous materials and human health, the following findings can be made:

1. There are no changes to the project or new circumstances involving new significant impacts or substantially more severe impacts than what was anticipated in the North Station Area Plan EIR.
2. No new information of substantial importance that was not discussed in the North Station Area Plan EIR has been identified that would require new analysis.
3. Implementation of the mitigation measures and/or development policies and standards contained in the North Station Area Plan EIR would reduce project impacts to less-than-significant levels.

Noise

Issues (and Supporting Information Sources)	Where in the Prior EIR is This Topic Discussed?	Did the Prior EIR Identify a Significant Impact and Mitigation Measures for This Topic?	Do Any Prior EIR Mitigation Measures Apply to the Project for This Topic?	Are There Any Changes to the Project or New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Is There Any New Information of Substantial Importance Requiring New Analysis?
A noise impact is considered significant if the project would result in:					
1) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance or of applicable standards of other agencies.	Impact 3.10.3, pp. 3.10-20 to 3.10-22	No	No	No	No
2) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.	Impact 3.10.4, pp. 3.10-22 to 3.10-24	Yes, MM 3.10.4	No	No	No
3) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.	Impact 3.10.2, pp. 3.10-18 to 3.10-20	No	No	No	No
4) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.	Impact 3.10.1, pp. 3.10-17 and 3.10-18	No	No	No	No

Discussion

No substantial change in the environmental setting related to noise and vibration has occurred since certification of the North Station Area Plan EIR, as described in Section 3.10, *Noise*, of the North Station Area Plan EIR.

Construction Noise

The analysis of impacts related to construction noise is included in the North Station Area Plan EIR as Impact 3.10.1 (pages 3.10-17 to 3.10-18). With implementation of BMPs for noise reduction and compliance with the City's noise regulations (i.e., City Municipal Code Chapter 17-16), which would minimize construction noise impacts on nearby sensitive receptors from construction implemented pursuant to the North Station Area Plan, the North Station Area Plan EIR concluded that impacts would be less than significant.

For the purposes of this analysis, it is assumed that development under the proposed project and development on the project site pursuant to the North Station Area Plan would be of a similar size. As previously discussed, the proposed project would involve construction activities similar to those expected with development under the North Station Area Plan and assumed in the North Station Area Plan EIR and have a footprint similar to that of development under the North Station Area Plan. For that reason, construction of the proposed project would be anticipated to result in noise levels similar to those from development on the project site as described in the North Station Area Plan EIR. Furthermore, the same types of equipment would be used to construct the proposed project, resulting in similar associated noise levels (see Table 3.10-7 of the North Station Area Plan EIR). The project would be subject to the same City noise regulations referenced in the North Station Area Plan EIR and would incorporate common BMPs similar to those referenced in the North Station Area Plan EIR. For that reason, the proposed project would be anticipated to have construction noise impacts similar to what was assumed under the North Station Area Plan. The proposed project would not be anticipated to generate a level of construction noise that would conflict with the City Municipal Code or cause a substantial increase in noise. Therefore, the impact would be ***less than significant***, consistent with the conclusion in the North Station Area Plan EIR.

Operational Noise

The analysis of impacts related to traffic noise is included in the North Station Area Plan EIR as Impact 3.10.2 (pages 3.10-18 to 3.10-20). The analysis of impacts related to the compatibility of proposed land uses with projected future noise levels is included in the North Station Area Plan EIR as Impact 3.10.3 (pages 3.10-20 to 3.10-22). The North Station Area Plan EIR analyzed the potential for the operation of development implemented pursuant to the North Station Area Plan to result in increased traffic noise as well as non-transportation-related noise. The City's analysis of roadway noise along affected roadways, with and without implementation of the North Station Area Plan, concluded that the increase in roadway noise that would occur with implementation of the North Station Area Plan would fall well below the 5-decibel threshold that would be considered a substantial noise increase. The noise impact analysis in the North Station Area Plan EIR determined that implementation of the North Station Area Plan would result in increased roadway noise that would range from 0.11 to 2.06 A-weighted decibels. The North Station Area Plan EIR concluded that impacts would be less than significant.

For the purposes of this analysis, it is assumed that development under the proposed project and development on the project site pursuant to the North Station Area Plan would be of a similar size. This analysis of operational noise evaluates the increase in population and the associated noise sources

compared to existing conditions within the project site due to the proposed project. Because the proposed project would result in a level of development that would be consistent with the level of development assumed for the project site in the North Station Area Plan EIR, the proposed project would be anticipated to result in roadway noise increases similar to those shown in Table 3.10-8 of the North Station Area Plan EIR. Furthermore, as anticipated in the North Station Area Plan EIR, the proposed project would not include the development of substantial sources of non-transportation-related noise. However, some sources of noise would be present, such as building mechanical equipment. The North Station Area Plan EIR concluded that General Plan Policy NS-B-4 would ensure that operational noise levels would be in compliance with applicable City noise standards. The same General Plan policy would apply to the proposed project. Therefore, the impact would be ***less than significant***, consistent with the conclusion in the North Station Area Plan EIR.

Groundborne Vibration

The analysis of impacts related to groundborne vibration is included in the North Station Area Plan EIR as Impact 3.10.4 (pages 3.10-22 to 3.10-24). The North Station Area Plan EIR concluded that implementation of the North Station Area Plan would not include major sources of ground vibration. The proposed project would be consistent with the North Station Area Plan and would not include major sources of ground vibration. The North Station Area Plan EIR determined that short-term construction-related activities could include impact pile driving, which could exceed commonly applied thresholds for structural damage and human annoyance. The City prescribed Mitigation Measure 3.10.4 in the North Station Area Plan EIR to reduce groundborne vibration from impact pile driving. The North Station Area Plan EIR concluded impacts would be less than significant with mitigation.

The proposed project would have a footprint and height similar to that anticipated for development in the North Station Area Plan EIR. The proposed project would also not require impact pile driving. Therefore, construction of the proposed project would not result in groundborne vibration that would exceed commonly applied thresholds and result in structural damage or human annoyance. Vibration resulting from project construction would also not be substantially different from the anticipated vibration from construction on the project site anticipated to occur pursuant to implementation of the North Station Area Plan. The proposed project would not be required to implement Mitigation Measure 3.10.4 because it would not require impact pile driving. Therefore, the impact would be ***less than significant***. That level of impact would be less than what was concluded in the North Station Area Plan EIR; this impact is within the level of impact already considered in the North Station Area Plan EIR.

Airport Noise

The analysis of impacts related to airport noise is included in the North Station Area Plan EIR on page 3.10-6. The project site is not within 2 miles of an airport or private airstrip. Therefore, there would be ***no impact***, consistent with the conclusion in the North Station Area Plan EIR.

Cumulative Impacts

The analysis of cumulative impacts related to noise is included in the North Station Area Plan EIR as Impact 3.10.5 (page 3.10-25). The North Station Area Plan EIR concluded that implementation of the North Station Area Plan would not result in a cumulatively considerable contribution to a significant impact.

As evaluated above, no new impacts have been identified for the proposed project. Therefore, when combined with the cumulative development evaluated in the North Station Area Plan EIR, no new cumulative impacts would occur. Although new cumulative impacts could occur when combined with impacts from cumulative development not evaluated in the North Station Area Plan EIR, there are no projects in the planning area for the North Station Area Plan that would be inconsistent with the land use designation established under the General Plan and zoning code or projects that were otherwise not anticipated in the North Station Area Plan EIR. Thus, the proposed project would not result in a significant cumulative impact. Cumulative impacts would be ***less than significant***.

Conclusion

With regard to noise, the following findings can be made:

1. There are no changes to the project or new circumstances involving new significant impacts or substantially more severe impacts than what was anticipated in the North Station Area Plan EIR.
2. No new information of substantial importance that was not discussed in the North Station Area Plan EIR has been identified that would require new analysis.
3. Implementation of the mitigation measures and/or development policies and standards contained in the North Station Area Plan EIR would reduce project impacts to less-than-significant levels.

Public Services and Utilities

Issues (and Supporting Information Sources)	Where in the Prior EIR is This Topic Discussed?	Did the Prior EIR Identify a Significant Impact and Mitigation Measures for This Topic?	Do Any Prior EIR Mitigation Measures Apply to the Project for This Topic?	Are There Any Changes to the Project or New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Is There Any New Information of Substantial Importance Requiring New Analysis?
A project would have a significant impact if it would:					
1) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities or the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for fire protection, emergency medical services, or police services.	Impact 3.12.1.1, pp. 3.12-4 to 3.12-6	Yes, MM 3.12.1	Yes, MM 3.12.1	No	No
2) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities or the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios or performance objectives for schools.	Impact 3.12.2.1, pp. 3.12-11 and 3.12-12	No	No	No	No

Issues (and Supporting Information Sources)	Where in the Prior EIR is This Topic Discussed?	Did the Prior EIR Identify a Significant Impact and Mitigation Measures for This Topic?	Do Any Prior EIR Mitigation Measures Apply to the Project for This Topic?	Are There Any Changes to the Project or New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Is There Any New Information of Substantial Importance Requiring New Analysis?
3) Result in the increased demand for additional personnel, equipment, or facilities that would impair the ability of library service providers to maintain an acceptable level of service.	Impact 3.12.3.1, pp. 3.12-14 and 3.12-15	No	No	No	No
4) Require or result in the construction of new water treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.	Impact 3.12.4.2, pp. 3.12-22 and 3.12-23	No	No	No	No
5) Have insufficient water supplies available to serve the project from existing entitlements and resources and/or require new or expanded entitlements.	Impact 3.12.4.1, pp. 3.12-21 and 3.12-22	No	No	No	No
6) Require or result in the construction of wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.	Impact 3.12.5.1, pp. 3.12-29 and 3.12-30	No	No	No	No
7) Result in a determination by the wastewater treatment provider that serves or may serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments.	Impact 3.12.5.1, pp. 3.12-29 and 3.12-30	No	No	No	No

Issues (and Supporting Information Sources)	Where in the Prior EIR is This Topic Discussed?	Did the Prior EIR Identify a Significant Impact and Mitigation Measures for This Topic?	Do Any Prior EIR Mitigation Measures Apply to the Project for This Topic?	Are There Any Changes to the Project or New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Is There Any New Information of Substantial Importance Requiring New Analysis?
8) Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.	Impact 3.12.5.2, pp. 3.12-30 to 3.12-32	No	No	No	No
9) Be served by a landfill with insufficient permitted capacity to accommodate the project's solid waste disposal needs.	Impact 3.12.6.1, p. 3.12-36	No	No	No	No
10) Fail to comply with federal, state, and local statutes and regulations related to solid waste.	Impact 3.12.6.2, p. 3.12-37	No	No	No	No
11) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios or performance objectives for parks.	Impact 3.12.7.1, pp. 3.12-41 to 3.12-42	No	No	No	No
12) Result in the increased demand for additional personnel, equipment, or facilities that would impair the ability of electrical, natural gas, and telecommunication service providers to maintain an acceptable level of service.	Impact 3.12.8.1, p. 3.12-46	No	No	No	No
13) Result in the inefficient, wasteful, and unnecessary consumption of energy.	Impact 3.12.8.1, p. 3.12-46	No	No	No	No

Discussion

No substantial change in the environmental setting related to public services and utilities has occurred since certification of the North Station Area Plan EIR, as described in Section 3.12, *Public Services and Utilities*, of the North Station Area Plan EIR.

Fire Protection, Police Projection, and Emergency Medical Services

The analysis of impacts related to the increased demand for fire protection, emergency medical services, and law enforcement is included in the North Station Area Plan EIR as Impact 3.12.1.1 (pages 3.12-4 to 3.12-6). The increase in population and development anticipated under the North Station Area Plan without a corresponding increase in fire and police department personnel could adversely affect the provision of fire, emergency medical, and police services in terms of increased service calls. Because residential development does not generate revenue for City services, as commercial development does, primarily through sales tax, new residential units planned in the area will contribute to a gap in funding for public safety services. Although North Station Area Plan Policies PF-4.1 and PF-4.2 provide language relative to the evaluation of funding, new residential development within the planning area will need to address impacts to these services. The City prescribed Mitigation Measure 3.12.1 in the North Station Area Plan EIR, which requires future residential subdivisions and multi-family residential development to mitigate impacts through annexation to the City's existing Special Tax District Number 2006-1, payment of a lump sum, provide private security, and/or include other uses to generate revenue to offset costs. The North Station Area Plan EIR concluded that impacts would be less than significant with mitigation.

The proposed project would construct approximately 900,600 square feet of new residential, amenity, retail, and ancillary uses on the project site, which is currently occupied by two single-family homes and undeveloped pastureland. The project site is currently served by the Santa Rosa Police Department and the Santa Rosa Fire Department. Emergency vehicle access is provided by the six project driveways, one dedicated emergency vehicle access driveway, and the internal roadways. A combination of internal roadways and public streets encompass all sides of the project building, providing direct access in case of emergencies. Dedicated access to the project site for emergency vehicles access would be provided via Guerneville Road, Lance Drive, and Iroquois Street. The proposed project would allow emergency vehicle access to all buildings through the proposed roadway network within the project site. Specifically, the project site would include 26-foot-wide fire lanes, providing connections between the parcels. Most fire lanes would be within a 150-foot hose-pull distance of all first-floor exterior walls, unless alternative compliance is authorized by the local fire jurisdiction. Fire department access would be provided around all buildings, and windows for egress would be provided at bedrooms. In addition, the proposed project would be required to comply with all applicable fire and safety codes contained in the Santa Rosa City Code. Furthermore, as a residential project, the proposed project would be subject to North Station Area Plan EIR Mitigation Measure 3.12.1, which would ensure that potential impacts related to public services personnel, equipment, and facility maintenance from the additional demand generated by the proposed project would be offset. Therefore, consistent with the conclusions in the North Station Area Plan EIR, the physical effects on the environment from the construction of new or expanded fire, police, or emergency medical facilities would be ***less than significant with implementation of the North Station Area Plan EIR mitigation measure.***

Public Schools

The analysis of impacts related to the increase in student enrollment in local schools is included in the North Station Area Plan EIR as Impact 3.12.2.1 (pages 3.12-11 to 3.12-12). Public school facilities and services are supported through the assessment of development fees in addition to funds from the state and local school districts. All new development in the planning area will be required to pay impact fees to offset the impact of new development on the school system. These fees will be assessed in accordance with provisions detailed under Senate Bill 50. Given that student generation expected to result from the North Station Area Plan would develop over many years and would be supported in already planned educational facilities, the North Station Area Plan would not result in the need for new, unplanned facilities. The North Station Area Plan EIR concluded that impacts would be less than significant.

The proposed project would include the development of residential uses (i.e., 772 dwelling units); thus, the proposed project would result in the generation of new students anticipated to enroll in the Santa Rosa City Schools District (SRCSD). Using the SRCSD's generation rate of 0.4 student per housing unit, the proposed project could result in approximately 309 new students.¹⁶ However, it is anticipated that the increase in student enrollment generated by the proposed project would be accommodated by the three elementary schools, one middle school, and two high schools near the project site, or other schools operated by SRCSD. In addition, the proposed project would be subject to SB 50 school impact fees, as established by the Leroy F. Greene School Facilities Act of 1998. These fees are used for facility maintenance and offset potential impacts from additional use. Section 65996 of the Government Code notes that payment of the school impact fees established by SB 50, which may be required by any state or local agency, is deemed to constitute full and complete mitigation for school impacts from development. Therefore, the physical effects on the environment from the construction of new or expanded school facilities would be ***less than significant***, consistent with the conclusion in the North Station Area Plan EIR.

Library Services

The analysis of impacts related to the increased demand for library facilities is included in the North Station Area Plan EIR as Impact 3.12.3.1 (page 3.12-14). North Station Area Plan Goal PF-4.1 ensures that development pays its fair share of funding for public services in the planning area and that available funding sources are used to implement additional area-wide improvements and Policy PF-11.1 calls for collaboration with the Sonoma County Library in their planning efforts to develop a new facility at an alternative site within the planning area. The North Station Area Plan would not result in the need for additional library facilities in excess of what is already planned. The North Station Area Plan EIR concluded that impacts would be less than significant.

The proposed project would include the development of residential uses (i.e., 772 dwelling units); thus, the proposed project would result in the generation of new residents who would use library facilities. However, consistent with North Station Area Plan Goal PF-4, the proposed project would be required to pay a fair-share contribution to public services, thereby providing funding for City library services and facilities and ensuring that no significant adverse effects related to library facilities. Therefore, the physical effects on the environment from the construction of new or expanded library facilities would be ***less than significant***, consistent with the conclusion in the North Station Area Plan EIR.

¹⁶ 772 dwelling units X 0.4 student/housing unit = 309 students

Water Supply and Facilities

The analysis of adequate water supply is included in the North Station Area Plan EIR as Impact 3.12.4.1 (pages 3.12-21 to 3.12-22). A water supply assessment (WSA) was prepared for the North Station Area Plan and is included in Appendix D1 to the North Station Area Plan EIR. As described in the North Station Area Plan EIR, the Sonoma County Water Agency and the City considered projected growth, including projected growth resulting from buildout of the North Station Area Plan, and determined that adequate water supplies would be available to accommodate future demands of developments within their service areas. Compliance with North Station Area Plan Goal PF-1 and Policies PF-1.1, PF-4.1, PF-4.2, PF-5.1, and PF-5.2 would minimize potential impacts to utilities in general. In addition, development would comply with SB 610, SB 221, and existing water conservation regulations. The North Station Area Plan EIR concluded that impacts would be less than significant.

The WSA prepared for the North Station Area Plan determined that the buildout of the North Station Area Plan would result in a demand for approximately 1,226 acre-feet per year of water. Based on estimates provided by the project sponsor, it is anticipated that the water demand of the proposed project would be approximately 161,522 gallons per day, or 181 acre-feet per year, of water.¹⁷ In addition, proposed sustainability measures would include low-flow plumbing fixtures and landscaping with drought-tolerant plant species to reduce water consumption associated with the proposed project. It is anticipated that the proposed project would represent approximately 15 percent of total water demand with buildout of the North Station Area Plan. The WSA prepared for the North Station Area Plan determined that there would be an adequate supply to meet existing demand as well as planned future demands associated with the North Station Area Plan. The proposed project would be consistent with the development assumptions for the project site in the North Station Area Plan EIR as well as the analysis. Thus, the water demand from the proposed project was accounted for in the water supply and demand projections in the North Station Area Plan EIR and there would be an adequate water supply available to serve the proposed project. Therefore, the impact would be ***less than significant***, consistent with the conclusion in the North Station Area Plan EIR.

Water Facilities

The analysis of the increased use of existing water infrastructure is included in the North Station Area Plan EIR as Impact 3.12.4.2 (pages 3.12-22 to 3.12-23). The Infrastructure Plan prepared for the North Station Area Plan provided in Appendix D3 to the North Station Area Plan EIR includes a detailed list of the improvements that would be required in the Specific Plan area to ensure that an adequate water supply system would be provided to support the development that would occur under the North Station Area Plan. The improvements have been incorporated into the North Station Area Plan. Incorporation of these improvements would ensure that adequate water facilities would be available in the planning area. The North Station Area Plan EIR concluded that impacts would be less than significant.

Santa Rosa Water provides the water service near the project site. On-site water system improvements would include the installation of public and private pipes, valves, private fire hydrants, meters and submeters, and backflow preventers to serve proposed residential and retail uses. Public on-site improvements would include the installation of approximately 2,200 linear-feet of 12-inch water main piping and appurtenances that would serve the proposed project. These public improvements would connect to existing water mains at Iroquois Street, Lance Drive, and Pawnee Street. All public improvements within the on-site development would be within a utility easement. Connections between the public and private water system would include meters and backflow

¹⁷ BKF Engineers. 2022. *Lance Drive, Preliminary Estimate for Water Demand*. May 10.

preventers. The private on-site water system would be designed as a looped system to accommodate fire flows and minimize water quality issues (e.g., stagnant flows) typically associated with non-looping, dead-end water lines. Off-site water improvements would include the installation of approximately 900 linear feet of 12-inch water main from the intersection of Ridley Avenue and Guerneville Road to the west boundary of existing assessor's parcel number 036-111-009. These improvements are included in the project design, and the potential environmental impacts from the improvements are analyzed throughout this checklist. The proposed project would be consistent with the development assumptions for the project site in the North Station Area Plan EIR as well as the analysis. Thus, the increased demand for water infrastructure from the proposed project was accounted for in the projections in the North Station Area Plan EIR. Therefore, the impact would be ***less than significant***, consistent with the conclusion in the North Station Area Plan EIR.

Wastewater

The analysis of the increased use of existing wastewater infrastructure is included in the North Station Area Plan EIR as Impact 3.12.5.1 (pages 3.12-29 to 3.12-30). The Infrastructure Plan prepared for the North Station Area Plan provided in Appendix D3 to the North Station Area Plan EIR includes a detailed list of the improvements that would be required in the Specific Plan area to ensure that an adequate wastewater system would be provided to support the development that would occur under the North Station Area Plan. The improvements have been incorporated into the North Station Area Plan. Incorporation of these improvements would ensure that adequate wastewater facilities would be available in the planning area. Compliance with North Station Area Plan Goals PF-1, PF-2 and PF-6 as well as Policies PF-2.2, PF-4.1, PF-4.2, PF-6.1, and PF-6.2 would ensure that new development pays for improvements to the wastewater system. Implementation of the North Area Station Plan would not exceed North Coast Regional Water Quality Control Board water treatment requirements for the Laguna Wastewater Treatment Plan because the General Plan and North Station Area Plan include goals and policies that ensure development will not occur without adequate wastewater infrastructure in place. The North Station Area Plan EIR concluded that impacts would be less than significant.

Santa Rosa Water would provide sewer service to the project site. Based on estimates provided by the project sponsor, it is anticipated that the proposed project would generate approximately 234,625 gallons per day of wastewater.¹⁸ The proposed project would be consistent with the development assumptions for the project site in the North Station Area Plan EIR as well as the analysis. Thus, the amount of wastewater generated by the proposed project is accounted for in the wastewater projections of the North Station Area Plan EIR. As described in more detail in the North Station Area Plan EIR, the capacity of the Laguna Wastewater Treatment Plant, which serves the planning area, would be enough to treat up to 21.3 million gpd of average dry-weather wastewater flow. Therefore, the wastewater treatment plant would have the capacity to handle the wastewater that would be generated by the proposed project.

On-site sewer system improvements would include the installation of public and private sewer infrastructure. On-site public improvements may include the installation of approximately 800 linear feet of gravity sewer pipe that would collect flows from the existing Pawnee Street neighborhood that is north of the project site, which is currently fed from an existing sanitary sewer lift station. This gravity main would replace an existing sewer force main that runs along the project site's west boundary. The gravity sewer main would be installed within a public utility easement. Additional site studies are needed to confirm if the proposed utility easement would also include the proposed on-site public water

¹⁸ BKF Engineers. 2022. *Lance Drive, Preliminary Estimate for Sanitary Sewer Demand*. May 10.

main improvements. Private on-site sanitary sewer improvements would include the installation of approximately 6,100 linear feet of gravity sewer pipes, manholes, and service laterals. Proposed sewer pipes would be between 8 and 24 inches in diameter. The proposed private sewer would connect to an existing public sewer main in Lance Drive and the proposed on-site public gravity sewer that would collect flows from Pawnee Street. These improvements are included in the project design, and the potential environmental impacts from the improvements are analyzed throughout this checklist. Therefore, the impact would be ***less than significant***, consistent with the conclusion in the North Station Area Plan EIR.

Stormwater

The analysis of the increased use of existing stormwater infrastructure is included in the North Station Area Plan EIR as Impact 3.12.5.2 (pages 3.12-30 to 3.12-32). The Infrastructure Plan prepared for the North Station Area Plan provided in Appendix D3 to the North Station Area Plan EIR includes a detailed list of the improvements that would be required in the Specific Plan area to ensure that adequate stormwater drainage would be provided to support the development that would occur under the North Station Area Plan. The improvements have been incorporated into the North Station Area Plan. Incorporation of these improvements would ensure that adequate stormwater drainage would be available in the planning area. City policy requires low impact development practices, which aim to mimic the existing hydraulic function of the undeveloped site by capturing, treating, and infiltrating stormwater as close to the source as possible and using small-scale landscape-based features located throughout the planning area. Compliance with North Station Area Plan Goals PF-1 and PF-2 as well as Policies PF-1.1, PF-2.2, PF-4.1, PF-4.2, PF-8.1, PF-8.2, and PF-8.3 would support the anticipated levels of development intensity in the planning area with adequate infrastructure and provide mechanisms to adequately construct and maintain public infrastructure and facilities. The North Station Area Plan EIR concluded that impacts would be less than significant.

Based on estimates provided by the project sponsor, it is anticipated that the proposed project would result in approximately 78.9 cubic feet per second during a 10-year peak flow and 112.4 cubic feet per second during a 100-year peak flow.¹⁹ The proposed project would be consistent with the development assumptions for the project site in the North Station Area Plan EIR as well as the analysis. Thus, the amount of stormwater generated by the proposed project is accounted for in the stormwater projections of the North Station Area Plan EIR. On-site storm drain improvements would include the installation of approximately 7,200 linear feet of gravity storm pipes, manholes, curb and drop inlets, low-impact development best management practice (LID-BMP) treatment systems, trash capture devices, and, potentially, low-flow pumps to convey treatment flows between the on-site storm main and LID BMP treatment systems. The proposed gravity storm pipes would be between 12 and 24 inches in diameter. New connections would connect to existing City storm drain connections in Pawnee Street and/or Lance Drive. Off-site storm drain improvements in Lance Drive would include an estimated 800 linear feet of gravity pipes, curb inlets, and public LID-BMP treatment systems. These improvements are included in the project design, and the potential environmental impacts from the improvements are analyzed throughout this checklist. Therefore, the impact would be ***less than significant***, consistent with the conclusion in the North Station Area Plan EIR.

¹⁹ BKF Engineers. 2022. *Lance Drive, Preliminary Estimate for Storm Peak Flow*. May 10.

Solid Waste

Increased Demand for Solid Waste Services

The analysis of the increased demand for solid waste services and facilities is included in the North Station Area Plan EIR as Impact 3.12.6.1 (page 3.12-36). The City, in collaboration with the Sonoma County Waste Management Agency, stated that its collection system and the County's disposal system can accommodate the waste associated with buildout of the planning area, provided that developments implement the recycling requirements and conform to legislation regarding recycling and disposal of prohibited materials. The North Station Area Plan EIR determined there is adequate capacity at the Central Landfill to meet the needs of the North Station Area Plan. In addition, all future development projects proposed in the planning area (and the larger Santa Rosa area) would be required to abide by and be consistent with federal, state, and local statutes and regulations related to solid waste, including the California Health and Safety Code, California Code of Regulations, California Public Resources Code, and City General Plan and Santa Rosa City Code. Compliance with North Station Area Plan Goal PF-7 ensures that solid waste disposal needs of existing and new development in the planning area would be met while providing opportunities for reduction, reuse, and recycling. North Station Area Plan Policies PF-7.1 and PF-2 seeks to expand recycling efforts and states that new development requiring demolition should reuse and recycle materials, respectively. The North Station Area Plan EIR concluded that impacts would be less than significant.

The proposed project would be consistent with the development assumptions for the project site in the North Station Area Plan EIR as well as the analysis. Thus, the amount of solid waste generated by the proposed project is accounted for in the solid waste projections of the North Station Area Plan EIR. Specifically, as described in more detail in the North Station Area Plan EIR, development under the North Station Area Plan would generate approximately 8.64 tons of solid waste per day, or 3,155 tons of solid waste per year, at full buildout. Central Landfill has a permitted daily capacity of 2,500 tons per day. The solid waste generated by the North Station Area Plan would represent approximately 0.3 percent of the landfill's daily permitted capacity. Such capacity would be more than enough to accommodate the solid waste generated by implementation of the North Station Area Plan, including the solid waste generated by the proposed project. The proposed project would include on-site recycling and composting facilities, in accordance with the state requirements, such as Assembly Bill (AB) 939. Waste, recyclables, and organic matter generated by the proposed project would be disposed of in solid waste and recycling enclosures located throughout the project site. In addition, for construction and demolition, the project sponsor intends to use a construction waste recycling program to minimize waste to the extent practicable. Therefore, the impact would be ***less than significant***, consistent with the conclusion in the North Station Area Plan EIR.

Solid Waste Regulation Conflict

The analysis of conflicts with solid waste regulations is included in the North Station Area Plan EIR as Impact 3.12.6.2 (page 3.12-37). All future development projects proposed in the planning area would be required to comply with federal, state, and local regulations relating to the disposal of solid waste. Development projects would also participate in recycling efforts to assist the City in complying with AB 939. The North Station Area Plan EIR concluded that impacts would be less than significant.

The proposed project would comply with federal, state, and local regulations relating to the disposal of solid waste. Therefore, the impact would be ***less than significant***, consistent with the conclusion in the North Station Area Plan EIR.

Parks and Recreation

The analysis of the contribution to deterioration of existing parks and recreation facilities is included in the North Station Area Plan EIR as Impact 3.12.7.1 (pages 3.12-41 to 3.12-42). Development that would occur under the North Station Area Plan would result in additional residential and nonresidential development throughout the planning area and potentially private and public improvements throughout the city with the potential for environmental effects related to recreational facilities. The North Station Area Plan assumes that new parks and recreational facilities would be built to help the City meet park service standards. Specifically, the North Station Area Plan includes policies and actions to ensure that park and recreational facilities keep pace with new development and that new parks and open spaces are created in the area for the North Station Area Plan. These North Station Area Plan goals and policies include, but are not limited to, Goal PSF-A, Goal PSF-B, Goal OSC-A, Policy PSF-A-4, and Policy PSF-A-15. In addition, development would be required to pay park and recreational land fees, in accordance with Chapter 19.70 of the Santa Rosa City Code. The North Station Area Plan EIR concluded that impacts would be less than significant.

The proposed project would be consistent with the development assumptions for the project site in the North Station Area Plan EIR as well as the analysis. Thus, the amount of use of existing parks and recreation facilities due to the proposed project is accounted for in the North Station Area Plan EIR. The proposed project would include common and private open space areas, swimming pools, pet parks, courtyards, a network of interconnected walkable paseos (or pathways), and communal landscaped amenity areas. In addition, a plaza (including a community garden) would be located on the corner of Guerneville Road and Lance Drive. The approximately 0.3-acre community garden would serve residents and the surrounding community. In addition to providing gardening space, it would be used as an educational space and gathering area. The project would include several residential amenity areas throughout the project site that would vary in size from approximately 0.3 acre to approximately 1 acre; some of the amenity areas would be centered around clubhouse or pavilion structures. In addition, the proposed project would be required to pay park and recreational land fees established in accordance with Chapter 19.70 of the Santa Rosa City Code, as appropriate. Therefore, the impact would be ***less than significant***, consistent with the conclusion in the North Station Area Plan EIR.

Electrical, Natural Gas, and Telecommunication Service

The analysis of the increased demand for electric, natural gas, and telecommunication services is included in the North Station Area Plan EIR as Impact 3.12.8.1 (pages 3.12-46). Although development that would occur under the North Station Area Plan would result in an increase in demand for electric, natural gas, and telecommunication services, the North Station Area Plan EIR found that electric, natural gas, and telecommunication services would have adequate capacity to support new development within the planning area. The City would reduce impacts caused by future development and redevelopment in the area for the North Station Area Plan (and larger Santa Rosa area) by financing the replacement and renewal of existing dry utility facilities as well as the construction of new dry utility facilities. Furthermore, the North Station Area Plan includes goals and policies, such as Policy PF-4.1, that ensure that private developments pay fair-share contributions toward necessary utility improvements within the area for the North Station Area Plan. Finally, the City's Capital Improvement Program, park and utility fees, redevelopment program funds, federal and state grant funds, and other funding sources would include funding for dry utility projects. The North Station Area Plan EIR concluded that impacts would be less than significant.

The proposed project would be consistent with the development assumptions for the project site in the North Station Area Plan EIR as well as the analysis. Thus, the amount of use of existing parks and recreation facilities due to the proposed project is accounted for in the North Station Area Plan EIR.

The proposed project would be consistent with the development assumptions for the project site in the North Station Area Plan EIR as well as the analysis. Thus, the amount of demand for electric, natural gas, and telecommunication services generated by the proposed project is accounted for in the North Station Area Plan EIR. The project proposes the installation of new connections for dry utility service. All electrical and telecommunication utilities would be connected to existing electrical and telecommunication utilities. The proposed project would not include any new connections for natural gas, which would not be used by the project. These improvements are included in the project's design. Impacts from these improvements are analyzed throughout this environmental checklist.

Energy would also be required to heat and cool the proposed buildings, provide indoor and outdoor lighting, and move water/wastewater. Based on estimates provided by the project sponsor, it is estimated that operation of the proposed buildings would require approximately 588,672 kilowatt hours of electricity per year.²⁰ The proposed project would incorporate sustainability features to reduce energy consumption, water consumption, and waste generation. The proposed project would include solar photovoltaic panels, electric-vehicle charging stations, an all-electric building design, energy-efficient appliances, high-efficiency indoor and outdoor lighting, landscaping with drought-tolerant plant species, and low-flow plumbing fixtures. The project sponsor would also use a construction waste recycling program during demolition and construction to minimize waste to the greatest extent practicable. In addition, the proposed project would be required by law to adhere to California Code of Regulations Title 24, the California Green Building Standards Code (CALGreen), which regulates the energy consumed for heating, cooling, ventilation, water heating, and lighting. Furthermore, in accordance with the City's Climate Action Plan (New Development Checklist), the proposed project would comply with CALGreen Tier 1 standards, which would reduce energy consumption. As such, the use of energy resources as a result of the proposed project would not be considered wasteful, inefficient, or unnecessary. Therefore, the impact would be ***less than significant***, consistent with the conclusion in the North Station Area Plan EIR.

Cumulative Impacts

The analysis of cumulative impacts related to fire protection, medical services, and law enforcement is included in the North Station Area Plan EIR as Impact 3.12.1.2 (pages 3.12-6 and 3.12-7). The analysis of cumulative impacts related to schools is included in the North Station Area Plan EIR as Impact 3.12.2.2 (page 3.12-12). The analysis of cumulative impacts related to library services is included in the North Station Area Plan EIR as Impact 3.12.3.2 (page 3.12-15). The analysis of cumulative impacts related to water is included in the North Station Area Plan EIR as Impact 3.12.4.3 (pages 3.12-23 and 3.12-24). The analysis of cumulative impacts related to wastewater and stormwater is included in the North Station Area Plan EIR as Impact 3.12.5.3 (page 3.12-32). The analysis of cumulative impacts related to solid waste is included in the North Station Area Plan EIR as Impact 3.12.6.3 (page 3.12-37). The analysis of cumulative impacts related to park facilities is included in the North Station Area Plan EIR as Impact 3.12.7.2 (page 3.12-43). The analysis of cumulative impacts related to electric, natural gas, and telecommunication service and infrastructure is included in the North Station Area Plan EIR as Impact 3.12.8.2 (page 3.12-47). The North Station Area Plan EIR concluded that implementation of the North Station Area Plan would not result in a cumulatively considerable contribution to a significant impact.

As evaluated above, no new impacts have been identified for the proposed project. Therefore, when combined with the cumulative development evaluated in the North Area Station Plan EIR, no new cumulative impacts would occur. Although new cumulative impacts could occur when combined with

²⁰ Pacific Development. 2022. Excel file with utilities calculations. July.

impacts from cumulative development not evaluated in the North Area Station Plan EIR, there are no projects in the planning area for the North Station Area Plan that would be inconsistent with the land use designation established under the General Plan and zoning code or that were otherwise not anticipated in the North Area Station Plan EIR. Thus, the proposed project would not result in a significant cumulative impact. Cumulative impacts would be ***less than significant***.

Conclusion

With regard to public services and utilities, the following findings can be made:

1. There are no changes to the project or new circumstances involving new significant impacts or substantially more severe impacts than what was anticipated in the North Station Area Plan EIR.
2. No new information of substantial importance that was not discussed in the North Station Area Plan EIR has been identified that would require new analysis.
3. Implementation of the mitigation measures and/or development policies and standards contained in the North Station Area Plan EIR would reduce project impacts to less-than-significant levels.

Traffic and Circulation

Issues (and Supporting Information Sources)	Where in the Prior EIR is This Topic Discussed?	Did the Prior EIR Identify a Significant Impact and Mitigation Measures for This Topic?	Do Any Prior EIR Mitigation Measures Apply to the Project for This Topic?	Are There Any Changes to the Project or New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Is There Any New Information of Substantial Importance Requiring New Analysis?
Transportation impacts are considered significant when the project would:					
1) Cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in the number of vehicle trips, the volume-to-capacity ratio on roads, or congestion at intersections).	Impact 3.13.1, pp. 3.13-33 to 3.13-37	No	No	No	No
2) Exceed, either individually or cumulatively, a level-of-service standard established by the county congestion management agency for designated roads or highways.	Freeway capacity: Impact 3.13.2, pp. 3.13-37 and 3.13-38 Freeway ramp operations: Impact 3.13.3, pp. 3.13-38 and 3.13-39	Freeway capacity: Yes, but no MM available Freeway ramp operations: No	No	No	No
3) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location, that would result in substantial safety risks.	Impact 3.13.8, p. 3.13-42	No	No	No	No
4) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).	Impact 3.13.9, p. 3.13-42	No	No	No	No

Issues (and Supporting Information Sources)	Where in the Prior EIR is This Topic Discussed?	Did the Prior EIR Identify a Significant Impact and Mitigation Measures for This Topic?	Do Any Prior EIR Mitigation Measures Apply to the Project for This Topic?	Are There Any Changes to the Project or New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Is There Any New Information of Substantial Importance Requiring New Analysis?
5) Result in inadequate emergency access.	Impact 3.13.10, p. 3.13-43	No	No	No	No
6) Result in inadequate parking capacity.	Not Discussed	Not Applicable	Not Applicable	Not Applicable	Not Applicable
7) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turn-outs, bicycle racks).	Impact 3.13.4, p. 3.13-39	No	No	No	No

Discussion

No substantial change in the environmental setting related to traffic and circulation has occurred since certification of the North Station Area Plan EIR, as described in Section 3.13, *Traffic and Circulation*, of the North Station Area Plan EIR.

A Transportation Impact Analysis was prepared for the proposed project in 2024 by Fehr & Peers.²¹ Appendix C to this checklist includes the Transportation Impact Analysis.

Area Roadways

The analysis of impacts related to area roadways is included in the North Station Area Plan EIR as Impact 3.13.1 (pages 3.13-33 to 3.13-37). Buildout of the North Station Area Plan would result in added traffic-related demand on Santa Rosa streets beyond that already envisioned with buildout of the City's General Plan. The North Station Area Plan includes roadway infrastructure improvements that, in tandem with projects already included in the City's Capital Improvements Program, would reduce corridor traffic impacts. The North Station Area Plan EIR concluded that impacts would be less than significant.

The analysis of transportation impacts in the North Station Area Plan EIR is based on level of service (LOS), which is no longer used as a basis for determining the significance of transportation impacts under CEQA pursuant to Senate Bill 743 (Public Resources Code [PRC] Section 21099 and CEQA Guidelines Section 15064.3). Although LOS is no longer a CEQA threshold, the Transportation Impact Analysis includes an informational intersection LOS analysis to aid in understanding whether off-site transportation improvements may be beneficial in promoting efficient vehicular circulation in the vicinity of the project site after implementation of the proposed project. The findings of the intersection LOS analysis are presented below for informational purposes.

Estimated Trip Generation and Assignment

As detailed in the Transportation Impact Analysis, the proposed project's trip generation was calculated using the MXD+ methodology for weekday daily trips, weekday AM peak-hour trips, and weekday PM peak-hour trips. MXD+ methodology was used as it more precisely estimates trip generation of mixed-use projects by accounting for the travel within the project (i.e., between uses), trips made by non-automobile modes, and the project's land use context. This approach to calculating trip generation does not account for transportation demand management (TDM) measures, such as a constrained parking supply, subsidized transit passes, or other incentives to travel by non-auto modes. According to the trip generation analysis in Table 6 of the Transportation Impact Analysis, the proposed project would generate 5,361 daily weekday trips, 294 net new AM peak-hour trips, and 418 net new PM peak-hour trips. The study intersections are presented in Figure 2 in the Transportation Impact Analysis and the trip assignment for the proposed project is presented in Figure 5 in the Transportation Impact Analysis.

Project Effect on Intersection Operations

Table 4-3 provides a summary of the informational, non-CEQA analysis of the proposed project's effect on intersection operations. As stated in the Transportation Impact Analysis, the project's study intersections are projected to operate within the City's established standards.

²¹ Fehr & Peers. 2024. *Lance Drive Project: Transportation Impact Analysis*. Prepared for Pacific Development, City of Santa Rosa. July.

Section 4.1 in the Transportation Impact Analysis includes the LOS analysis for the Existing with Project Conditions scenario; the results of the LOS calculations indicate that all of the study intersections are projected to continue operating acceptably with respect to their LOS standard in the Existing with Project Conditions scenario. Section 5.1.3 in the Transportation Impact Analysis includes the LOS analysis for the Near Term with Project Conditions scenario; the addition of project-generated traffic to Near Term Baseline Conditions was not found to violate any of the City's established LOS policies. Section 6.1.2 in the Transportation Impact Analysis includes the LOS analysis for the Cumulative with Project Conditions scenario; the changes in delay and LOS between Cumulative and Cumulative with Project conditions would not result in any violations of the City's adopted standards. The impact would be consistent with the conclusion in the North Station Area Plan EIR.

Table 4-3. Summary of the Project's Effect on Intersection Operations

Intersection	Intersection Operating Within City Standards? ^a		
	Existing with Project	Near Term with Project	Cumulative with Project
1. Marlow Road/West Steele Lane	Yes	Yes	Yes
2. Iroquois Street-Apple Valley Lane/West Steele Lane	Yes	Yes	Yes
3. Range Avenue/West Steele Lane	Yes	Yes	Yes
4. Guerneville Road/Marlow Road	Yes	Yes	Yes
5. Guerneville Road/Ridley Avenue	Yes	Yes	Yes
6. Guerneville Road/Lance Drive	Yes	Yes	Yes
7. Guerneville Road/North Dutton Avenue	Yes	Yes	Yes
8. Guerneville Road/Coffey Lane	Yes	Yes	Yes
9. Guerneville Road/Range Avenue	Yes	Yes	Yes
10. Guerneville Road/Steele Way	Yes	Yes	Yes
11. Guerneville Road/Cleveland Avenue	Yes	Yes	Yes
12. Guerneville Road/U.S. 101 southbound ramps	Yes	Yes	Yes
13. Guerneville Road/U.S. 101 northbound ramps	Yes	Yes	Yes
14. Marlow Road-Stony Point Road/West College Avenue	Yes	Yes	Yes
15. North Dutton Avenue/West College Avenue	Yes	Yes	Yes
16. Lance Drive/Iroquois Street	Yes	Yes	Yes
17. Iroquois Street/Project Driveway 1	Yes	Yes	Yes
18. Iroquois Street/Project Driveway 2	Yes	Yes	Yes
19. Lance Drive/Project Driveway 3	Yes	Yes	Yes
20. Guerneville Road/Project Driveway 4	Yes	Yes	Yes
Source: Fehr & Peers, 2024.			
Notes:			
a. The findings of the level of service (LOS) analysis are presented for informational purposes.			

Freeway Capacity

The analysis of impacts related to freeway capacity in the area is included in the North Station Area Plan EIR as Impact 3.13.2 (pages 3.13-37 and 3.13-38). Three U.S. 101 freeway segments, from downtown Santa Rosa to College Avenue, from College Avenue to Steele Lane, and from Steele Lane to Bicentennial

Avenue, are projected to operate below the California Department of Transportation (Caltrans) LOS standard of LOS C/D in the future, both with and without the North Station Area Plan. There are no known physical improvements that would result in acceptable freeway operation in the future and no means for development within the area for the North Station Area Plan to contribute fair-share payments to projects such as a freeway expansion projects. The North Station Area Plan EIR concluded that the incremental increase in traffic associated with the North Station Area Plan would result in cumulatively considerable and significant and unavoidable impacts.

As discussed under *Area Roadways*, above, the Transportation Impact Analysis includes an informational intersection LOS analysis to aid in understanding of whether off-site transportation improvements may be beneficial in promoting efficient vehicular circulation in the vicinity of the project site after implementation of the proposed project. The findings of the intersection LOS analysis are presented below for informational purposes.

Vehicle trips generated by the proposed project (described under *Estimated Trip Generation and Assignment*, above) would represent only a small percentage of overall daily and peak-hour traffic on freeways. Such trips are not expected to exceed available capacity on U.S. 101. As discussed above, the findings of the intersection LOS analysis are presented for informational purposes. The impact would be consistent with the conclusion in the North Station Area Plan EIR.

Area Freeway Ramp Operations

The analysis of impacts related to area freeway ramp operations is included in the North Station Area Plan EIR as Impact 3.13.3 (page 3.13-38). Intersection operations and off-ramp queues at U.S. 101 interchanges at College Avenue and Steele Lane are expected to be within acceptable ranges with buildout of the North Station Area Plan and its associated roadway improvements. The North Station Area Plan EIR concluded that impacts would be less than significant.

The anticipated increase in trip generation due to the proposed project (described under *Area Roadways*, above) is not expected to exceed available storage at U.S. 101 ramp intersections at College Avenue and Steele Lane. Therefore, the impact would be ***less than significant***, consistent with the conclusion in the North Station Area Plan EIR.

Consistency with Alternative Transportation Policies and Plans

The analysis of impacts related to consistency with alternative transportation policies and plans is included in the North Station Area Plan EIR as Impact 3.13.4 (page 3.13-39). The North Station Area Plan was developed to both support and expand current policies regarding alternative transportation. The North Station Area Plan EIR concluded that impacts would be less than significant.

The proposed design elements (e.g., bicycle and pedestrian circulation improvements, bicycle parking, TDM measures) would encourage alternative forms of transportation. The proposed bicycle and pedestrian circulation improvements are described under *Bicycle and Pedestrian Circulation*, below. Approximately 336 bicycle parking spaces would be provided throughout the project site. Specifically, in compliance with CALGreen Tier 1 standards for bicycle parking, approximately 50 short-term bicycle parking spaces would be adjacent to each residential building and approximately 286 long-term bicycle parking spaces would be near the residential clubhouses. In addition, the proposed project would comply with City Zoning Code requirements related to bicycle parking. Consistent with the goals of the Sonoma County Transportation Authority Comprehensive

Transportation Plan, such as increasing transit use through the intensification of development around transit hubs, the proposed project would construct a mixed-use community with a variety of home configurations, residential amenities, and commercial retail uses approximately 0.2 mile northwest of the SMART station. In addition, the proposed project would include a new Class I bicycle facility along the boundary of the project site on Guerneville Road. Similar to the North Station Area Plan, the proposed project would be consistent with the 2008 Countywide Bicycle and Pedestrian Master Plan as well as city-wide planning documents, including the City's General Plan and Bicycle and Pedestrian Master Plan. Furthermore, the proposed project would not preclude alternative transportation improvements identified in the City's alternative transportation policies and plans. Therefore, the impact would be ***less than significant***, consistent with the conclusion in the North Station Area Plan EIR.

Bicycle and Pedestrian Circulation

The analysis of impacts related to bicycle and pedestrian circulation is included in the North Station Area Plan EIR as Impact 3.13.5 (pages 3.13-39 to 3.13-41). The North Station Area Plan includes new bicycle and pedestrian connections that support and expand upon the improvements identified in the City's Bicycle and Pedestrian Master Plan. The North Station Area Plan would further enhance the grid network of streets in the planning area. The grid pattern increases mobility and ease of access for both bicyclists and pedestrians by creating multiple routes and minimizing travel distances. In addition, the North Station Area Plan would designate several streets as "complete streets," which would further increase bicyclist and pedestrian mobility and ease of travel by providing wider sidewalks, bicycle lanes, landscaped buffers between sidewalks and travel lanes, enhanced pedestrian crossings, and additional streetscape amenities. The North Station Area Plan EIR concluded that impacts would be less than significant.

The proposed project would construct a mixed-use community with a variety of home configurations, residential amenities, and commercial retail uses approximately 0.2 mile northwest of the SMART station. Therefore, the proposed project would result in a concentration of housing, jobs, and shopping opportunities within bicycling and walking distance of one another. The proposed street improvements along Lance Drive, Iroquois Street, and Guerneville Road would include new curbs, gutters, and sidewalks. The proposed project would also include walkable paseos along the exterior and interior of the project site. The proposed project would include a new Class I facility along the boundary of the project site on Guerneville Road. Therefore, the impact would be ***less than significant***, consistent with the conclusion in the North Station Area Plan EIR.

Transit

The analysis of impacts related to transit is included in the North Station Area Plan EIR as Impact 3.13.6 (page 3.13-41). By concentrating jobs, housing, and shopping in a transit-oriented development pattern surrounding the SMART station and the Northside Transfer Center, the North Station Area Plan is by design intended to increase transit ridership and reduce dependence on private automobile travel. Buildout of the North Station Area Plan is estimated to result in a net increase in the number of residential units (i.e., 2,941 additional units) and jobs (i.e., 5,923 additional jobs) compared to what currently exists in the station area. These incremental increases are projected to translate into approximately 269 additional daily SMART trips at the North Santa Rosa station, including 123 trips from employment-based uses and 146 trips from residential uses. The North Station Area Plan EIR concluded that impacts would be less than significant.

The project site is approximately 0.2 mile northwest of the SMART station. It is also about 0.25 mile from existing bus routes and stops along Guerneville Road and West Steele Lane. According to the Transportation Impact Analysis, the anticipated increase in passenger demand due to the proposed project is not projected to exceed available transit capacity. Therefore, the impact would be ***less than significant***, consistent with the conclusion in the North Station Area Plan EIR.

Construction Activities

The analysis of impacts related to construction activities that may temporarily affect vehicular, bicycle, and pedestrian circulation is included in the North Station Area Plan EIR as Impact 3.13.7 (pages 3.13-41 and 3.13-42). Construction projects generate truck traffic for a variety of purposes throughout the construction schedule, including material and equipment deliveries, earthwork, etc. The construction workforce also generates commute trips by automobile. Although construction projects may periodically require traffic detours, with submittal of a traffic control plan, the North Station Area Plan EIR concluded that impacts would be less than significant.

Pursuant to the City's Standard Conditions of Approval, Section C(7)(e), a traffic control plan in conformance with the latest edition of Caltrans' *Manual of Traffic Controls for Construction and Maintenance Work Zones* will be prepared and submitted. Therefore, the impact would be ***less than significant***, consistent with the conclusion in the North Station Area Plan EIR.

Air Traffic

The analysis of impacts related to air traffic is included in the North Station Area Plan EIR as Impact 3.13-8 (page 3.13-42). The planning area is approximately 5.25 miles southeast of Charles M. Schulz-Sonoma County Airport. Therefore, there would be ***no impact***, consistent with the conclusion in the North Station Area Plan EIR.

Hazardous Design Features

The analysis of impacts related to hazardous design features is included in the North Station Area Plan EIR as Impact 3.13.9 (page 3.13-42). The North Station Area Plan EIR concluded that impacts would be less than significant.

Vehicular access to the project site would be provided from one driveway along Guerneville Road, two driveways along Lance Drive, and three driveways along Iroquois Street. The proposed internal roads would be configured in a loop pattern, providing access to the proposed buildings, parking, and on-site amenities. Sight distance at the proposed driveways is not expected to change compared with existing conditions. Although the proposed project is expected to increase the number of bicycle and pedestrian trips to the driveways, the proposed project would provide pedestrian-scale lighting around the perimeter of the project site and along adjacent sidewalks so that bicyclists and pedestrians would be visible to drivers. The proposed improvements to the transportation and circulation system would be designed and constructed to local, regional, and federal standards, which will be confirmed as part of the compliance process conducted by the City. Therefore, the proposed project would not create a new geometric design feature that would cause a hazard. The impact would be ***less than significant***, consistent with the conclusion in the North Station Area Plan EIR.

Emergency Access

The analysis of impacts related to emergency access is included in the North Station Area Plan EIR as Impact 3.13.10 (page 3.13-43). The North Station Area Plan EIR concluded that impacts would be less than significant.

According to the Transportation Impact Analysis, factors such as the number of access points, roadway width, and proximity to fire stations determine whether a site provides adequate emergency access. Emergency vehicle access would be provided by six project driveways, one dedicated emergency vehicle access driveway, and internal roadways. A combination of internal roadways and public streets would encompass all sides of the project's buildings, providing direct access in case of emergency. Dedicated access to the project site for emergency vehicles access would be provided via Guerneville Road, Lance Drive, and Iroquois Street. The proposed project would allow emergency vehicle access to all buildings through the proposed roadway network within the project site. Specifically, the project site would include 26-foot-wide fire lanes, providing connections between the parcels. Most fire lanes would be within a 150-foot hose-pull distance of all first-floor exterior walls, unless alternative compliance is authorized by the local fire jurisdiction. Fire department access would be provided around all buildings, and windows for egress would be provided at bedrooms. The fire stations that would most likely serve the project site are Santa Rosa Fire Department Stations 2 and 3, located on Stony Point Road and Coffey Lane, respectively. Both are about 1 mile away from the project site. Although the proposed project may increase traffic congestion in the vicinity of the project site, emergency vehicles would still retain the right to preempt traffic signals and use their lights and sirens to indicate that drivers need to yield, according to the Transportation Impact Analysis. Therefore, the impact would be **less than significant**, consistent with the conclusion in the North Station Area Plan EIR.

Parking Supply

The North Station Area Plan EIR does not include an analysis related to parking. According to the Transportation Impact Analysis, the Santa Rosa City Code notes the requirements for the number of off-street automobile parking spaces to be provided by project type in Section 20-36.040, following the North Station Area Plan. The proposed project would include a total of 1,491 parking spaces on the project site. The proposed parking supply for automobiles would exceed the required number of parking spaces, thereby satisfying Santa Rosa City Code requirements.

Cumulative Impacts

The analysis of cumulative impacts related to traffic and noise is included in the North Station Area Plan EIR as Impact 3.13.2 (pages 3.13-37 and 3.13-38). The North Station Area Plan EIR concluded that implementation of the North Station Area Plan would result in a cumulatively considerable contribution to a significant impact.

As evaluated above, no new impacts have been identified for the proposed project. Therefore, when combined with the cumulative development evaluated in the North Area Station Plan EIR, no new cumulative impacts would occur. Although new cumulative impacts could occur when combined with cumulative development not evaluated in the North Area Station Plan EIR, there are no projects in the planning area for the North Station Area Plan that would be inconsistent with the land use designation established under the General Plan and zoning code or that were otherwise not anticipated in the North Area Station Plan EIR. The Transportation Impact Analysis analyzed cumulative (2040) conditions with respect to the City's General Plan and other regional planning documents. The analysis found that cumulative impacts, including project conditions, would not meet respective LOS standards for four

intersections; however, the project's effect on intersection operations is considered to be less than substantial for all cumulatively adversely affected intersections after installation of improvements, such as timing improvements. Therefore, the proposed project's contribution would not be cumulatively considerable.

Cumulative impacts would be ***significant and unavoidable, as identified in the North Station Area Plan EIR. Implementation of the proposed project would not result in traffic and circulation impacts greater than those identified in the North Station Area Plan EIR.***

Conclusion

With regard to traffic and circulation, the following findings can be made:

1. There are no changes to the project or new circumstances involving new significant impacts or substantially more severe impacts than what was anticipated in the North Station Area Plan EIR.
2. No new information of substantial importance that was not discussed in the North Station Area Plan EIR has been identified that would require new analysis.
3. Even with implementation of the mitigation measures and/or development policies and standards contained in the North Station Area Plan EIR, impacts would be significant and unavoidable but no more severe than the impact identified in the North Station Area Plan EIR.

Climate Change and Greenhouse Gases

Issues (and Supporting Information Sources)	Where in the Prior EIR is This Topic Discussed?	Did the Prior EIR Identify a Significant Impact and Mitigation Measures for This Topic?	Do Any Prior EIR Mitigation Measures Apply to the Project for This Topic?	Are There Any Changes to the Project or New Circumstances Involving New Significant Impacts or Substantially More Severe Impacts?	Is There Any New Information of Substantial Importance Requiring New Analysis?
The City considers impacts related to climate change significant if implementation of the proposed project would result in any of the following:					
1) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.	Impact 3.14.1, pp. 3.14-13 to 3.14-18	Yes, MM 3.3.1 & MM 3.14-1	Yes, MM 3.3.1 & MM 3.14-1	No	No
2) Conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases.	Impact 3.14.1, pp. 3.14-13 to 3.14-18	No	No	No	No

Discussion

No substantial change in the environmental setting related to climate change and greenhouse gases (GHGs) has occurred since certification of the North Station Area Plan EIR, as described in Section 3.14, *Climate Change and Greenhouse Gases*, of the North Station Area Plan EIR.

GHG emissions are considered to be a cumulative impact in CEQA because they contribute to global warming on a cumulative basis. No single project can generate enough GHG emissions to change global temperatures. Therefore, the discussion of GHG emissions in CEQA occurs solely as an analysis of cumulative impacts.

The discussion of construction and operational GHG emissions below is based on the assumption that the project proposes a level of development similar to the level of development for the project site analyzed in the North Station Area Plan EIR. Specifically, the proposed project would involve construction activities similar to those expected with development under the North Station Area Plan and assumed in the North Station Area Plan EIR and have a footprint similar to that of development under the North Station Area Plan. The duration of construction and the process would not be substantively different from that anticipated for the site in the North Station Area Plan EIR. Long-term operational GHG emissions at the project site would reflect an increase in population and associated energy use, water consumption, and waste generation, as considered in the discussion of operational emissions below. Nonetheless, by proposing up to 772 dwelling units, the project would be consistent with the level of development assumed for the project site in the North Station Area Plan EIR.

Construction GHG Emissions

The analysis of impacts related to construction GHG emissions is included in the North Station Area Plan EIR as Impact 3.14.1 (pages 3.14-13 to 3.14-14). The North Station Area Plan EIR concluded that development pursuant to the North Station Area Plan would result in intermittent short-term increases in GHG emissions generated by the construction of individual projects within the area for the North Station Area Plan. As described in the North Station Area Plan EIR, at the time of certification for the EIR, BAAQMD did not have an adopted threshold of significance for construction-related GHG emissions, and the North Station Area Plan does not include policy provisions for implementing BAAQMD-recommended BMPs associated with minimizing GHG emissions from construction activities. As a result, the City prescribed Mitigation Measure 3.14.1 in the North Station Area Plan EIR, which implements BAAQMD-recommended control measures/BMPs, where applicable, to reduce short-term construction-related GHG emissions from buildout of the North Station Area Plan to a level that would be less than cumulatively considerable. The City concluded that Mitigation Measure 3.3.1 in the North Station Area Plan EIR, which implements BAAQMD-recommended BMPs to reduce construction-related air pollutant emissions, would also minimize construction-related GHG emissions. The North Station Area Plan EIR concluded that impacts would be less than significant with mitigation.

As with development under the North Station Area Plan, which was analyzed in the North Station Area Plan EIR, the proposed project may result in short-term increases in GHG emissions. As previously discussed, the proposed project would involve construction activities similar to those expected with development under the North Station Area Plan and assumed in the North Station Area Plan EIR and have a footprint similar to that of development under the North Station Area Plan. For that reason, short-term GHG emissions resulting from construction of the proposed project would be similar to those expected from development of the project site under the North Station Area Plan EIR.

As determined in the North Station Area Plan EIR, implementation of Mitigation Measures 3.3.1 and 3.14.1 would be effective in reducing short-term GHG emissions from project construction to levels that would be below the threshold of significance provided in the North Station Area Plan EIR. Therefore, the impact would be ***less than significant with implementation of the North Station Area Plan EIR mitigation measure***, consistent with the conclusion in the North Station Area Plan EIR.

Operational GHG Emissions

The analysis of impacts related to operational GHG emissions is included in the North Station Area Plan EIR as Impact 3.14.1 (pages 3.14-15 to 3.14-18). The North Station Area Plan EIR concluded that operational GHG emissions resulting from implementation of the North Station Area Plan would be below the BAAQMD threshold in effect at the time (i.e., 4.6 metric tons of carbon dioxide equivalent per service population²² per year), thereby supporting the state with respect to meeting its Assembly Bill 32 (AB 32) goals regarding reduced statewide GHG emissions. Furthermore, the North Station Area Plan EIR concluded that the North Station Area Plan would not conflict with or impede implementation of the strategies outlined in the scoping plan for achieving the reduction goals identified in AB 32. The North Station Area Plan EIR concluded that impacts would be less than significant and less than cumulatively considerable.

The proposed project would be consistent with the development assumptions for the project site in the North Station Area Plan EIR as well as the analysis. For that reason, it is not anticipated that the proposed project would result in a substantial increase in operational emissions throughout the area for the North Station Area Plan than the increase anticipated to occur in the North Station Area Plan EIR. Furthermore, as it relates to City and regional GHG reduction goals and plans, the proposed project would further the City's intent to use infill development to add residential density to an area that is proximate to a major transit stop and well within Santa Rosa's urban core. Therefore, it is anticipated that the project would result in lower VMT and associated GHG emissions compared with residential development farther from the city center. Therefore, the impact would be ***less than significant and less than cumulatively considerable***, consistent with the conclusion in the North Station Area Plan EIR.

Conclusion

With regard to climate change and GHGs, the following findings can be made:

1. There are no changes to the project or new circumstances involving new significant impacts or substantially more severe impacts than what was anticipated in the North Station Area Plan EIR.
2. No new information of substantial importance that was not discussed in the North Station Area Plan EIR has been identified that would require new analysis.
3. Implementation of the mitigation measures and/or development policies and standards contained in the North Station Area Plan EIR would reduce project impacts to less than cumulatively considerable levels.

²² Residents plus employees.

Chapter 5

Applicable CEQA Provisions and Findings

This chapter presents the provisions of the California Environmental Quality Act (CEQA) that are applicable to the Lance Drive Project (proposed project). The chapter concludes with the CEQA finding and a determination that the proposed project is exempt from further CEQA review.

5.1 Applicability of California Government Code Section 65457 and CEQA Guidelines Section 15182 to the Project

Chapter 1, *Introduction*, includes the relevant guidance of Government Code Section 65457 and CEQA Guidelines Section 15182.

5.1.1 California Government Code Section 65457

The proposed project includes the demolition of existing single-family residential units and associated structures as well as the phased construction of up to 772 dwelling units, consisting of 672 apartments and 100 single-family residences. In addition, the proposed project would include approximately 5,000 square feet of retail uses. Thus, the proposed project is considered a mixed-use project that includes primarily residential uses. The project site is within the planning area for the North Santa Rosa Station Area Specific Plan (North Station Area Plan). The City of Santa Rosa (City) prepared an environmental impact report (EIR) for the North Station Area Plan, which was certified by the Santa Rosa City Council on September 18, 2012.

As evaluated in Chapter 4, *Consistency Analysis & Environmental Checklist*, the proposed project would implement and be consistent with the North Station Area Plan and its certified EIR. Certification of the EIR satisfies the provisions of Public Resources Code Section 21166. No substantial changes to the project, as anticipated by the North Station Area Plan, are proposed that would require major revisions to the North Station Area Plan EIR. There are no substantial changes with respect to the circumstances under which the project would be undertaken that would require major revisions to the North Station Area Plan EIR. In addition, there is no new information that has become available since the North Station Area Plan EIR was certified. Therefore, as a residential development project that is both being undertaken to implement the North Station Area Plan and consistent with the North Station Area Plan and its certified EIR, Government Code Section 65457 is satisfied, and no further CEQA review is warranted.

5.1.2 CEQA Guidelines Section 15182

Chapter 1, *Introduction*, includes the relevant guidance of CEQA Guidelines Section 15182.

5.1.2.1 Project Proximate to Transit

The proposed project includes the demolition of existing single-family residential units and associated structures as well as the phased construction of up to 772 dwelling units, consisting of 672 apartments and 100 single-family residences. In addition, the proposed project would include approximately 5,000 square feet of retail uses. Thus, the proposed project is considered a mixed-use project that includes primarily residential uses.

A Transit Priority Area (TPA) is defined as an area within 0.5 mile of a major transit stop, either planned or existing, such as a rail transit station, ferry terminal served by transit, or the intersection of two or more major bus routes (Public Resources Code Section 21099[a][7]). The Metropolitan Transportation Commission has identified TPAs within the Bay Area.¹ The project site is approximately 0.2 mile northwest of the Santa Rosa North Sonoma-Marin Area Rail Transit (SMART) station, which equates to an estimated 7-minute walk. Thus, the project site is designated as being within a TPA and considered proximate to transit.

The project site is within the planning area for the North Station Area Plan. The City prepared an EIR for the North Station Area Plan, which was certified by the Santa Rosa City Council on September 18, 2012. As discussed in Chapter 4, *Consistency Analysis & Environmental Checklist*, the proposed project would implement and be consistent with the North Station Area Plan and its certified EIR.

The project site is assigned Medium-Density Residential, Medium High-Density Residential, and Retail and Business Services land use designations in the City of Santa Rosa General Plan 2035 (see Figure 2-4 in Chapter 2, *Project Description*) and the North Station Area Plan.² The Medium-Density Residential land use designation permits a range of housing types, including single-family attached housing and multi-family developments, with a maximum density of 18 units per acre. The Medium High-Density Residential land use designation permits a similar range of housing types, with a maximum density of 30 units per acre. The Retail and Business Services land use designation permits retail and service enterprises, offices, and restaurants. As shown in the conceptual site plan (Figure 2-5 in Chapter 2), the proposed project would be constructed in three phases:

- **Phase 1:** Phase 1 would be located on the south side of the project site, within the Medium High-Density Residential land use designation and the Retail and Business Services land use designation. In total, Phase 1 would result in 26.47 units per acre, consistent with the Medium High-Density Residential land use designation. The proposed retail uses would be located on the corner of Guerneville Road and Lance Drive, consistent with the Retail and Business Services land use designation.
- **Phase 2:** Phase 2 would be located on the north side of the project site, within the Medium-Density Residential land use designation. In total, Phase 2 would result in 12.82 units per acre, consistent with the Medium-Density Residential land use designation.
- **Phase 3:** Phase 3 would be located on the west side of the project site, within the Medium High-Density Residential land use designation, for Phase 3A, and the Medium-Density Residential land use designation, for Phase 3B. In total, Phase 3A would result in 28.80 units per acre, consistent with the Medium High-Density Residential land use designation. Phase 3B would result in 18.01 units per acre, consistent with the Medium-Density Residential land use designation.

¹ Metropolitan Transportation Commission. 2021. *Transit Priority Areas*. Available: <https://opendata.mtc.ca.gov/datasets/MTC::transit-priority-areas-2021-1/explore>. Accessed: September 28, 2023.

² City of Santa Rosa. 2020. *General Plan Land Use Diagram*. December 8. Available: <https://www.srcity.org/DocumentCenter/View/3094/General-Plan-Land-Use-Diagram-PDF-December-2021>. Accessed: September 14, 2023.

As discussed in Section 3.4, *Priority Development Area*, in Chapter 3, *Relevant City Planning Documents*, the project site is within the North Santa Rosa Station Area Priority Development Area (PDA), which implements and is consistent with Plan Bay Area 2050, the region's sustainable communities strategy. Based on the above, the proposed project would be consistent with the general use designation, density, building intensity, and applicable policies specified for the project site in a sustainable communities strategy.

CEQA Guidelines Section 15182(b)(2) provides that additional environmental review shall not be required for a project unless an event described in CEQA Guidelines Section 15162 occurs with respect to that project. Based on the analysis and conclusions of this document, none of the events identified in CEQA Guidelines Section 15162 would occur with implementation of the proposed project, as discussed in Section 5.2.1, *CEQA Guidelines Section 15162*, below. Therefore, pursuant to CEQA Guidelines Section 15162, Sonoma County Local Agency Formation Commission (LAFCo) is not required to prepare a subsequent EIR to the North Station Area Plan EIR. The proposed project, being proximate to transit and consistent with the North Station Area Plan, is exempt from further CEQA review pursuant to CEQA Guidelines Section 15182.

5.1.2.2 Residential Project Implementing a Specific Plan

The proposed project includes the demolition of existing single-family residential units and associated structures as well as the phased construction of up to 772 dwelling units, consisting of 672 apartments and 100 single-family residences. In addition, the proposed project would include approximately 5,000 square feet of retail uses. Thus, the proposed project is considered a mixed-use project that includes primarily residential uses. The project site is within the planning area for the North Station Area Plan, which was adopted by the City on September 18, 2012.

As discussed in Section 5.1.2.1, *Project Proximate to Transit*, the project site is assigned Medium-Density Residential, Medium High-Density Residential, and Retail and Business Services land use designations in the City of Santa Rosa General Plan 2035 and the North Station Area Plan.³ The proposed number of units per acre in each phase of the proposed project would be consistent with the applicable land use designation. As evaluated in Chapter 4, *Consistency Analysis & Environmental Checklist*, the proposed project would implement and be consistent with the North Station Area Plan and its certified EIR.

If, after the adoption of a specific plan, an event described in CEQA Guidelines Section 15162 occurs, CEQA Guidelines Section 15182(c)(2) provides that an exemption shall not apply until the city or county completes subsequent CEQA analysis, as specified in Section 15162. Based on the analysis and conclusions of this document, none of the events identified in CEQA Guidelines Section 15182 would occur with implementation of the proposed project, as discussed in Section 5.2.1, *CEQA Guidelines Section 15162*, below. Therefore, pursuant to CEQA Guidelines Section 15162, Sonoma County LAFCo is not required to prepare a subsequent EIR to the North Station Area Plan EIR. The proposed project, being a residential project implementing a specific plan, is exempt from further CEQA review pursuant to CEQA Guidelines Section 15182.

³ City of Santa Rosa. 2020. *General Plan Land Use Diagram*. December 8. Available: <https://www.srcity.org/DocumentCenter/View/3094/General-Plan-Land-Use-Diagram-PDF-December-2021>. Accessed: September 14, 2023.

5.2 Applicability of CEQA Guidelines Section 15168 to the Project

Chapter 1, *Introduction*, includes relevant guidance from CEQA Guidelines Section 15168. As evaluated in Chapter 4, *Consistency Analysis & Environmental Checklist*, the proposed project would be consistent with the North Station Area Plan EIR. None of the conditions specified in CEQA Guidelines Section 15162 are present. Therefore, per CEQA Guidelines Section 15168, no further CEQA review is warranted.

5.2.1 CEQA Guidelines Section 15162

Chapter 1, *Introduction*, includes relevant guidance from CEQA Guidelines Section 15162. The project site is within the planning area for the North Station Area Plan. The City prepared an EIR for the North Station Area Plan, which was certified by the Santa Rosa City Council on September 18, 2012. There are no proposed changes or revisions to the North Station Area Plan. The proposed project would implement and be consistent with the North Station Area Plan and its certified EIR. Certification of the EIR satisfies the provisions of Public Resources Code Section 21166. Therefore, CEQA Guidelines Section 15162 is not triggered because the North Station Area Plan EIR was certified in 2012. Since its certification, no substantial changes have been proposed that would require major revisions, no substantial changes have occurred with respect to the circumstances under which the project would be undertaken, and no new information of substantial importance has been identified. When none of the conditions specified in CEQA Guidelines Section 15162 are present, no further CEQA review is warranted.

5.3 CEQA Determination and Summary of Findings

As summarized above and presented herein, the proposed project is eligible for the following CEQA provisions:

- Project Proximate to Transit and Residential Project Implementing a Specific Plan Pursuant to CEQA Guidelines Section 15182; and
- Project Consistent with a Program EIR Pursuant to CEQA Guidelines Section 15168.

For the reasons described in Section 5.1, *Applicability of California Government Code Section 65457 and CEQA Guidelines Section 15182 to the Project*, and Section 5.2, *Applicability of CEQA Guidelines Section 15168 to the Project*, the proposed project is statutorily exempt from CEQA, and no further CEQA review is warranted. We do hereby certify that the above determination has been made pursuant to state and local requirements.

Signature

Date

Chapter 6

Environmental Conditions of Approval

This chapter includes the full text of the mitigation measures identified in the North Santa Rosa Station Area Specific Plan Environmental Impact Report (North Station Area Plan EIR) that would be applicable to the proposed project, as discussed in the checklist in Chapter 4, *Consistency Analysis & Environmental Checklist*. These mitigation measures will be imposed on the proposed project as environmental conditions of approval.

Aesthetics and Visual Resources

MM 3.1.4 For construction of structures greater than three stories tall, the City shall require the use of building materials designed to reduce glare. Examples of these types of materials include, but are not limited to, windows treated with glare-reductive coating or film covering, matte-finish tiles, marble, or sheet metal, and nonreflective flashing material.

Air Quality

MM 3.3.1 During earth-disturbing activities, the contractor shall be responsible for spraying exposed soil surfaces with water or another approved dust inhibitor. The contractor would be responsible for cleaning streets and driveways of fugitive soils in the immediate vicinity of construction work, as necessary.

The contractor shall be responsible for ensuring that all construction equipment and vehicles are maintained in good operating order and that all factory-installed emission control devices are installed and functioning properly. All vehicles and construction equipment shall be turned off when not in use to minimize emissions.

- Water all active construction areas at least twice daily as required.
- Cover all trucks hauling soil, sand, and other loose materials or require all truck to maintain at least 2 feet of freeboard.
- Sweep daily, as required, all paved access roads, parking areas and staging areas at construction sites.
- Sweep streets daily as required if visible soil material is carried onto adjacent public streets.
- Reduce unnecessary idling of truck equipment within proximity to sensitive receptors (i.e., idle time to 5 minutes or less).
- Where possible, use newer, cleaner-burning diesel-powered construction equipment
- Properly maintain construction equipment per manufacturer specifications.
- Designate a disturbance coordinator responsible for ensuring that mitigation measures to reduce air quality impacts from construction are properly implemented.

MM 3.3.3

The following measures shall be implemented for future development projects located within the Specific Plan area:

- a. Project-specific analyses shall be required for future development projects within the Specific Plan area that would result in the development of new sensitive land uses within 1,000 feet of a major permitted stationary source or within the overlay zones of Highway 101, sufficient to demonstrate consistency or inconsistency with applicable BAAQMD-recommended health-risk thresholds (i.e., increased cancer risk of 10 in a million, increased non-cancer risk of <1.0 Hazard Index [Chronic or Acute], ambient PM_{2.5} increase of <0.3 g/m³ annual average). If site-specific modeling indicates that significant exposure to criteria pollutants, including toxic air contaminants, would occur, future development shall comply, to the maximum extent feasible, with mitigation measures provided by the BAAQMD for the reduction of air quality impacts. These measures shall comply with the most current regulations available at the time of development and will likely include the following measures:

- Modification to the location and height of intakes to the ventilation system.
- Addition of HEPA air filtration systems.
- Limiting the placement of recreational use areas, such as patio areas and balconies, to interior courtyards and requiring that they be shielded by the structure.
- Triple-paned windows.
- Central heating, ventilation, and air conditioning (HVAC) systems with high-efficiency filters.
- Locating air intake systems for the HVAC systems as far away from the roadway as possible.
- An ongoing HVAC maintenance plan.

These measures shall be designed and implemented to the satisfaction of the City Community Development Department, Planning Division in consultation with the BAAQMD.

- b. Project-specific analyses shall be required for future development projects within the Specific Plan area that would result in the development of new area sources of TAC or PM_{2.5} emissions (such as non-permitted sources like loading docks involving the use of diesel-powered equipment and delivery vehicles) within 1,000 feet of a sensitive land use, sufficient to demonstrate consistency or inconsistency with applicable BAAQMD-recommended health-risk thresholds (i.e., increased cancer risk of 10 in a million, increased non-cancer risk of <1.0 Hazard Index [Chronic or Acute], ambient PM_{2.5} increase of <0.3 g/m³ annual average). If site-specific modeling indicates that significant exposure to criteria pollutants, including toxic air contaminants, would occur, future development shall comply, to the maximum extent feasible, with mitigation measures provided by BAAQMD for the reduction of air quality impacts. These measures shall comply with the most current regulations available at the time of development and will likely include the following measures:

- Increase new area sources of TAC or PM_{2.5} emissions distance from sensitive land uses.
- Design the site layout to locate any permitted major stationary source of air toxics or other non-permitted TAC sources (e.g., loading docks, parking lots) as far as possible from sensitive receptors.
- Large projects involving non-permitted TAC sources like loading docks or parking lots shall consider phased development where commercial/retail portions of the project that are near sensitive land uses are developed last. This would allow time for CARB's diesel regulations to take effect in reducing diesel emissions. Ultimately, lower concentrations would be anticipated in the near future such that residential development would be impacted by less risk in later phases of development.
- Tiered plantings of trees such as redwood, deodar cedar, live oak, and oleander shall be installed between loading docks and parking lots and sensitive land uses in order to reduce TAC and diesel PM exposure.

Biological Resources

MM 3.4.1 If there is the potential for destruction of a nest or substantial disturbance to nesting birds or bats due to construction activities, a plan to monitor nesting birds or bats during construction shall be prepared and submitted to the USFWS and CDFG for review and approval. The City shall comply with all USFWS or CDFG guidance for protection of nesting birds.

If vegetation, buildings, or bridges that potentially provide nesting sites must be removed between February 1 and August 31, a qualified wildlife biologist shall conduct pre-construction surveys no greater than 14 days before removal. If an active bird nest is found, the bird shall be identified as to species and the approximate distance from the closest work site to the nest estimated. No additional measures need be implemented if active nests are more than the following distances from the nearest work site: (a) 300 feet for raptors; or (b) 75 feet for other non-special-status bird species. Disturbance of active nests shall be avoided to the extent possible until it is determined that nesting is complete and the young have fledged. To ensure bats are absent or flushed from roost locations prior to demolition of buildings, trees and construction activities on bridges, preconstruction surveys should be undertaken no more than 6 months before construction activities to identify suitable bat habitat. If flushing of bats from construction sites is necessary, it shall be done by the qualified biologist during the non-breeding and non-hibernating seasons: August 31 through October 15 and March 1 through April 15, respectively. When flushing bats, structures shall be moved carefully to avoid harming individuals, and torpid bats given time to completely arouse and fly away. Where feasible, trees that are determined to be suitable habitat will be trimmed and removed in a two-phase, two-day method. The first day, limbs and branches will be removed by a chainsaw. Limbs with cavities, crevices, or deep bark fissures would be avoided. On the second day, the tree would be removed.

MM 3.4.2 A formal wetland delineation shall be conducted for areas that will be permanently or temporarily impacted by the project. If jurisdictional waters cannot be avoided, the City shall apply for a CWA Section 404 permit from the USACE and a Section 401 permit from the RWQCB. These permits shall be obtained prior to issuance of grading permits and implementation of the proposed project.

The City shall ensure that the project will result in no net loss of waters of the U.S. and/or of the State by providing mitigation through impact avoidance, impact minimization, and/or compensatory mitigation for the impact, as determined in the CWA Section 404/401 permits.

Compensatory mitigation may consist of (a) obtaining credits from a mitigation bank; (b) making a payment to an in-lieu fee program that will conduct wetland, stream, or other aquatic resource restoration, creation, enhancement, or preservation activities (these programs are generally administered by government agencies or nonprofit organizations that have established an agreement with the regulatory agencies to use in-lieu fee payments collected from permit applicants); and/or (c) providing compensatory mitigation through an aquatic resource restoration, establishment, enhancement, and/or preservation activity. This last type of compensatory mitigation may be provided at or adjacent the impact site (i.e., on-site mitigation) or at another location, usually within the same watershed as the permitted impact (i.e., off-site mitigation). The project proponent/permit applicant retains responsibility for the implementation and success of the mitigation project.

Evidence of compliance with this mitigation measure shall be provided prior to construction and grading activities for the proposed project.

Public Services and Utilities

- MM 3.12.1** Future residential subdivisions and multi-family residential development within the Specific Plan area shall be required to mitigate the impacts of the increased need for public safety services, including fire protection, emergency medical services, and law enforcement, resulting from a proposed development to a less than significant level by implementation of one of the following mitigation measures:
1. Annexation of all newly created parcels and multi-family residential development to the City's existing Special Tax District Number 2006-1.
 2. Payment of a lump sum adequate to cover the increased public safety service costs associated with providing services to a proposed residential subdivision or multi-family residential development.
 3. Provision of private security, fire protection, and emergency medical services to the residents of a proposed residential subdivision or multi-family residential development in perpetuity.
 4. Inclusion of other uses, consistent with the City of Santa Rosa General Plan 2035 and zoning regulations, within a proposed residential development that would generate revenue to offset the costs of providing public safety services to the development, where appropriate.

Climate Change and Greenhouse Gases

- MM 3.14.1** The City shall require all subsequent development projects located within the Specific Plan area to implement applicable BAAQMD-recommended basic construction mitigation measures and, where applicable, additional BAAQMD-recommended control measures/best management practices.
- a. Prior to issuance of grading or building permits, all future development projects, to the extent applicable and practical, shall specify on the final project plans implementation of BAAQMD-recommended construction-related measures to reduce GHG emissions during construction activities. These measures include, as feasible:
 1. Use of alternative-fueled (i.e., biodiesel, electric) construction vehicles and equipment to the maximum extent possible;
 2. Use of local construction materials (within 100 miles) to the maximum extent possible; and
 3. Recycle construction waste and demolition materials to the maximum extent possible.

Chapter 7

Report Preparation

This chapter includes a list of people who reviewed and prepared the checklist and supporting materials for the project.

7.1 City of Santa Rosa, Planning and Economic Development (Lead Agency)

Senior Planner	Conor McKay
----------------	-------------

7.2 ICF (CEQA Consultant)

Project Director	Heidi Mekkelson
Project Manager	Jessica Viramontes
Deputy Project Manager, Aesthetics and Visual Resources, Biological Resources, Traffic and Circulation	Kate Thompson
QA/QC Reviewer	Gina Hamilton
QA/QC Reviewer, Public Services and Utilities	Devan Atteberry
Air Quality	Cory Matsui
	Kelsey Hartfelder
	Pierre Glaize
Noise	Cory Matsui
	Noah Schumaker
Cultural Resources (Built-Environment Resources)	Allison Lyons-Medina
	Nicole Felicetti
Hazards and Hazardous Materials	Mario Barrera
Editing and Document Production	John Mathias

7.3 Fehr & Peers (Transportation Consultant)

Transportation	Ashlee Takushi
Transportation	Ian Barnes
Transportation	Kayla Gonzalez

Appendices

Supporting Materials for the Air Quality Analysis

Health Risks from Existing Sources for Future Onsite Sensitive Receptors

MEI Coordinates

E	N
522508.36	4256147.57

Health Risks at Future Onsite Receptors

Source	Cancer Risk	Chronic Hazard	PM2.5
Road	35	0.1	0.4
Rail	<1	<0.1	<0.1
Stationary	<1	<0.1	<0.1
Total	35	0.1	0.4
Threshold	100	10.0	0.8
Exceed?	No	No	No

Permitted Stationary Facility Summary

Facility Name	Address	City	State	County	Latitude	Longitude	Details	Cancer Risk	Chronic Hazard Index	PM 2.5
Verizon Wireless (West Santa Rosa)	1550 Guerneville Road	Santa Rosa	CA	Sonoma	38.453177	-122.744059	Generator	2.316	0.001	0.003

Diesel Internal Combustion (IC) Engine Distance Multiplier Tool: This distance multiplier tool refines the screening values for cancer risk and PM_{2.5} concentrations found in the District's Stationary Source Screening Analysis Tool for permitted facilities which contain only diesel IC engines, to represent adjusted risk and hazard impacts that can be expected with farther distances from the source of emissions.

Diesel Internal Combustion Engines

Distance (meters)	Distance (feet)	Distance adjustment multiplier	Enter Risk or Hazard	Adjusted Risk or Hazard	Enter PM _{2.5} Concentration	Adjusted PM _{2.5} Concentration
0	0.0	1.000		0		0
5	16.4	1.000		0		0
10	32.8	1.000		0		0
15	49.2	1.000		0		0
20	65.6	1.000		0		0
25	82.0	0.85		0		0
30	98.4	0.73		0		0
35	114.8	0.64		0		0
40	131.2	0.58		0		0
50	164.0	0.5		0		0
60	196.9	0.41		0		0
70	229.7	0.31		0		0
80	262.5	0.28		0		0
90	295.3	0.25		0		0
100	328.1	0.22		0		0
110	360.9	0.18		0		0
120	393.7	0.16		0		0
130	426.5	0.15		0		0
140	459.3	0.14		0		0
150	492.1	0.12		0		0
160	524.9	0.1	2.316	0.2316	0.003	0.0003
180	590.6	0.09		0		0
200	656.2	0.08		0		0
220	721.8	0.07		0		0
240	787.4	0.06		0		0
260	853.0	0.05		0		0
280	918.6	0.04		0		0

Diesel Internal Combustion (IC) Engine Distance Multiplier Tool: This distance multiplier tool refines the screening values for cancer risk and PM_{2.5} concentrations found in the District's Stationary Source Screening Analysis Tool for permitted facilities which contain only diesel IC engines, to represent adjusted risk and hazard impacts that can be expected with farther distances from the source of emissions.

Diesel Internal Combustion Engines

Distance (meters)	Distance (feet)	Distance adjustment multiplier	Enter Risk or Hazard	Adjusted Risk or Hazard	Enter PM _{2.5} Concentration	Adjusted PM _{2.5} Concentration
0	0.0	1.000		0		0
5	16.4	1.000		0		0
10	32.8	1.000		0		0
15	49.2	1.000		0		0
20	65.6	1.000		0		0
25	82.0	0.85		0		0
30	98.4	0.73		0		0
35	114.8	0.64		0		0
40	131.2	0.58		0		0
50	164.0	0.5		0		0
60	196.9	0.41		0		0
70	229.7	0.31		0		0
80	262.5	0.28		0		0
90	295.3	0.25		0		0
100	328.1	0.22		0		0
110	360.9	0.18		0		0
120	393.7	0.16		0		0
130	426.5	0.15		0		0
140	459.3	0.14		0		0
150	492.1	0.12		0		0
160	524.9	0.1	0.001	0.0001		0
180	590.6	0.09		0		0
200	656.2	0.08		0		0
220	721.8	0.07		0		0
240	787.4	0.06		0		0
260	853.0	0.05		0		0
280	918.6	0.04		0		0

Supporting Materials for the Built-Environment Analysis



Santa Rosa Lance Drive Project: Cultural Resources Archaeological and Built-Environment Records Search, Identification, and Evaluation Methods

To:	City of Santa Rosa
From:	Nicole Felicetti, Architectural Historian, ICF Allison Lyons Medina, Senior Architectural Historian, ICF
Date:	July 26, 2024

This memo presents the results of a records search and historic-age property identification and evaluation conducted by ICF for the Santa Rosa Lance Drive Project to determine if there are previously recorded archaeological and built-environment resources on the project site and which properties required a California Register of Historical Resources (CRHR) eligibility evaluation. Cultural resources research was conducted from May to August 2022.

Lora Holland, Senior Archaeologist, ICF, conducted a records search request at the Northwest Information Center (NWIC) on May 26, 2022, to determine if there are previously recorded historic resources (archaeological and built-environment) or studies conducted on the project site or within a 0.25-mile search radius of the project site. The NWIC, an Office of Historic Preservation affiliate, is the official state repository of cultural resources records and reports for Sonoma County.

The 2022 NWIC records search identified no previously recorded archaeological and built-environment resources within the project site, and five previously recorded archaeological and built-environment resources within a 0.25-mile radius. The results are presented in Table 1 below.

Table 1. 2022 NWIC Previously Recorded Cultural Resources within the 0.25-mile Record Search Radius

P Number	Resource Name	Resource Attributes	NRHP Status
P-49-002834	Northwestern Pacific Railroad	AH02 (Foundations/structure pads); AH04 (Privies/dumps/trash scatters); AH07 (Roads/trails/railroad grades); AH15 (Standing structures); HP11 (Engineering structure) - railroad and features; HP17 (Railroad depot); HP19 (Bridge); HP39 (Other)	6Z
P-49-005022	SMART-TM-050	AP16 (Other) - obsidian flake	Not evaluated

P Number	Resource Name	Resource Attributes	NRHP Status
P-49-005023	SMART-TM-054	AP16 (Other) - white chert biface	Not evaluated
P-49-005864	2863 W. Steele Lane	HP02 (Single family property)	Not evaluated
P-49-006086	“Off Campus” Building; Other name: Bethel Baptist Church	HP02 (Single family property); HP16 (Religious building)	6Y

NRHP Status Codes: 6Y: Determined ineligible for NRHP by consensus through Section 106 process – Not evaluated for CRHR or Local Listing; 6Z: Found ineligible for NR, CR, or Local designation through survey evaluation.

The 2022 NWIC records search also documented two previous cultural resources studies within the project site, and 15 studies within a 0.25-mile radius of the project site. The results are presented in Table 2 and Table 3 below.

Table 2. 2022 NWIC Previous Cultural Resources Studies within the Project Site

Report No.	Author/Affiliation	Year	Title
S-005856	C. Kristina Roper, Cultural Resources Facility, Sonoma State University	1983 (April)	<i>Results of an Archaeological Investigation for the proposed Pawnee Subdivision No. 1 and 2, (A.P. No. 015-565-32), Santa Rosa, Sonoma County, California</i>
S-013497	Thomas M. Origer	1992 (February)	<i>An Archaeological Survey for the Fountaingrove Project, City of Santa Rosa Subregional Water Reclamation System, Santa Rosa, Sonoma County, California</i>

Table 3. 2022 NWIC Previous Cultural Resources Studies within the 0.25-mile Record Search Radius

Report No.	Author/Affiliation	Year	Title
S-000014	John A. Rauschkolb III	1973 (June)	<i>An Archaeological Reconnaissance of the Proposed Development on the Elmendorff Properties, Santa Rosa, California</i>
S-000955*	Archaeological Consulting and Research Services, Inc.	1975 (September)	<i>Preliminary Archaeological Assessment for the Coddington Environmental Impact Report, Santa Rosa, California</i>
S-009007	David G. Bieling, Anthropological Studies Center, Cultural Resources Facility, Sonoma State University	1987 (March)	<i>An Archaeological Investigation of 3.16 Acres on West Steele Lane, Santa Rosa, Sonoma County, California</i>
S-009061	David G. Bieling, Anthropological Studies Center, Cultural Resources Facility, Sonoma State University	1987 (April)	<i>An Archaeological Investigation of 3 Acres of Land on Jennings Avenue in Santa Rosa, Sonoma County, California</i>
S-013217	Thomas M. Origer	1990	<i>An Archaeological Survey for the AT&T Fiber</i>

Santa Rosa Lance Drive Project: Cultural Resources Archaeological and Built-Environment Records Search and Evaluation Methods

July 26, 2024

Page 3 of 4

Report No.	Author/Affiliation	Year	Title
		(November)	<i>Optics Cable, San Francisco to Point Arena, California</i>
S-022871	Eric Strother, Archaeological Resource Service	1999 (September)	<i>A Cultural Resources Evaluation of the West Steele Lane Subdivision, Sonoma County, California</i>
S-022881	Eric Strother, Archaeological Resource Service	2000 (February)	<i>A Cultural Resources Evaluation of the Proposed "For Pete Sake" Memorial Rugby/Soccer Field at Northwest Community Park, Santa Rosa, Sonoma County, California</i>
S-031737*	Carole Denardo and Daniel Hart, Garcia and Associates	2004 (October)	<i>Archaeological Resources Technical Report for the Sonoma Marin Rail Transit (SMART) Project, Sonoma and Marin Counties, California</i>
S-033459	Cassandra Chattan, Archaeological Resource Service	2007 (March)	<i>A Historic Structures Evaluation of the Property at 1215 Jennings Avenue, Santa Rosa, Sonoma County, California</i>
S-037608	Lauren Del Bondio and Thomas M. Origer, Tom Origer & Associates	2010 (October)	<i>A Cultural Resources Survey for the City of Santa Rosa Creek Restoration Project, Sonoma County, California</i>
S-045663	Meg Scantlebury, ICF International	2014 (February)	<i>Draft Cultural Resources Inventory and Evaluation Report for Sonoma-Marin Area Rail Transit (SMART): IOS-1B and Operations and Maintenance Facility Site, Santa Rosa, Sonoma County, (MP 55.2–MP 59.9)</i>
S-047399	Madeline Bowen, AECOM	2015 (September)	<i>Historic Property Survey Report, Sonoma Marin Area Rail Transit (SMART) Non-Motorized Pathway (NMP), Marin and Sonoma Counties, California, District 4 - SON/MAR, Federal Aid Project # RPSTPLE 6411 (005)</i>
S-048798*	Anne Bloomfield, Anne Bloomfield Architectural History	1989 (August)	<i>Cultural Heritage Survey of the City of Santa Rosa, California</i>
S-049112*	Thomas M. Origer, Tom Origer & Associates	2016 (August)	<i>Historic Property Survey Report, Crosswalk Enhancement Throughout Santa Rosa Project in the City of Santa Rosa in Sonoma County, 04-SON-O-SRO, HSIPL 5028 (073)</i>
S-049161	Sally Evans, Evans & DeShazo	2017 (January)	<i>A Cultural Resource Study Of The Proposed "Comstock Place" Project At 2863 W. Steele Lane, Santa Rosa, Sonoma County, California</i>

*: denotes a study where the *approximate location* is within the 0.25-mile Record Search Radius

A California Office of Historic Preservation list of Archaeological Determination of Eligibility in Sonoma County (dated April 5, 2012) and a digital scan of an 1863 (revised 1866) map of Sonoma County made and published by A.B. Bowers were also received as part of the records search results.

Nicole Felicetti, Architectural Historian, ICF, conducted local municipality research and compiled previous cultural resource reports, archival material, and historic aerial photographs to identify historic resources in the project site. ICF collected historic material and information on the two historic-age buildings and structures on the project site (1601 and 1696 Lance Drive) from the Sonoma County Clerk-Recorder Office, Permit Sonoma, and the Sonoma County History and Genealogy Library.

In July and August 2022, ICF evaluated the historic-age built-environment resources at 1601 and 1696 Lance Drive for historical significance, with consideration of the National Register of Historic Places (NRHP) and CRHR designation criteria and in accordance with Section 15064.5(a)(2)–(3) of the CEQA Guidelines. ICF's evaluation concluded that none of the extant buildings or structures on the project site should be considered historical resources for the purposes of CEQA. The DPR 523 form sets containing the inventory and evaluation of extant buildings on the project site is enclosed.

Please contact Nicole (Nicole.Felicetti@icf.com) or Allison (Allison.LyonsMedina@icf.com) with any questions.

Sincerely,



Nicole Felicetti, Architectural Historian, ICF



Allison Lyons Medina, Senior Architectural Historian, ICF

Enclosures: Built-Environment Evaluations for 1601 and 1696 Lance Drive (DPR 523 form sets)

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # _____
HRI # _____
Trinomial _____
NRHP Status Code _____

Other Listings _____
Review Code _____ Reviewer _____ Date _____

Page 1 of 14

*Resource Name or #: 1601 Lance Drive

P1. Other Identifier: 1607 Guerneville Road

***P2. Location:** ☐ Not for Publication ☒ Unrestricted

***a. County** Sonoma

***b. USGS 7.5' Quad:** Santa Rosa **Date** 2021 **T** 8N **R** 8W ; **¼ of ¼ of Sec** 30 **B.M.** MDB&M

c. Address: 1601 Lane Drive **City** Santa Rosa **Zip** 95401

d. UTM: **Zone** 10 S; 382714.94 mE/ 1224430.72 mN

e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate) APN: 036-111-016-000; unincorporated Sonoma County.

***P3a. Description:**

1601 Lance Drive is a former agricultural property located in unincorporated Sonoma County immediately east of the intersection of Lance Drive and Guerneville Road. The property contains a residence, barn, garage, pump house, shed, various outbuildings, and what appear to be remnants of previous buildings (**Figure 1**). The majority of the parcel remains cleared and undeveloped, and the collection of buildings and other site features is located in the east half of the parcel and is accessed from Guerneville Road via a gravel driveway. A secondary grouping of three buildings is located at the northwestern corner of the parcel.

A residence is located at the center of the various buildings on the property. The following buildings surround the residence: the barn is to the north, the garage is to the northwest, the pump house is to the southwest, the shed is to the south, and various outbuildings are to the north. A chain link fence with regular wood posts surrounds the entire parcel. A small line of what remains of a vertical wood fence is in disrepair adjacent to the southeast corner of the residence. Dense trees surround the residence's southeast corner and the barn's southwest corner, obscuring much of the buildings from the public right-of-way.

(See continuation sheet.)

***P3b. Resource Attributes:** HP2. Single family property; HP32. Rural open space; HP33. Farm/ranch

***P4. Resources Present:** ☒ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other

P5a. Photograph or Drawing



P5b. Description of Photo:

(Figure 1) Remnants of the residence, wood fence, and driveway, viewed facing north from Guerneville Road. Source: ICF 07/13/2022

***P6. Date Constructed/Age and Sources:**

☒ Historic ☐ Prehistoric ☐ Both
Extant buildings were constructed at an undetermined date between 1911 and 1952 (Sonoma County 1911:6; NETR 1952; UCSB 1953).

***P7. Owner and Address:**

Charles D. Tesconi & Dorothy E. Trust
PO Box 1537
Windsor, CA 95492-1537

***P8. Recorded by:**

Nicole Felicetti, ICF
201 Mission Street, Suite 1500
San Francisco, CA 94105

***P9. Date Recorded:** July 19, 2022

***P10. Survey Type:** Intensive

***P11. Report Citation:** ICF. 2022. Alta Santa Rosa Project Historical Assessment. August. (ICF 104518.0.001) San Francisco, CA. Prepared for Wood Partners, Sausalito, California.

***Attachments:** ☐ NONE ☒ Location Map ☒ Sketch Map ☒ Continuation Sheet ☒ Building, Structure, and Object Record ☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record

BUILDING, STRUCTURE, AND OBJECT RECORD

Primary # _____
HRI # _____

Page 2 of 14

*NRHP Status Code: 6Z

*Resource Name or #: 1601 Lance Drive

B1. Historic Name: 1601 Lance Drive

B2. Common Name: 1601 Lance Drive

B3. Original Use: Residential and agricultural

B4. Present Use: Vacant, zoned residential/agricultural

***B5. Architectural Style:** Utilitarian

***B6. Construction History:**

The buildings at 1601 Lance Drive were constructed at an undetermined date between 1911 and 1952, based on review of historical maps and aerial photographs (Sonoma County 1911:6; NETR 1952). In 1952, there were four primary buildings on the subject parcel among a small grid of trees, including the residence, barn, garage, and one other rectangular-plan building that was demolished at the end of the 20th century. The extant shed was added to the property between 1968 and 1982. Various outbuildings around the residence were added and removed throughout the latter decades of the 20th century. A chain-link fence surrounding the entirety of the parcel was also added at an undetermined date in the 20th century (NETR 1952, 1968, 1982, 1983, 1993, 2005, 2010, 2018). The shed and the wood and corrugated metal fence at the residence's southeast corner have undergone modifications in the 21st century (Google Earth Pro 2011, 2015, 2018). Grading on the site was completed in 1985. Building permits and architectural drawings were not on record at Permit Sonoma; however, County records suggest the property has undergone numerous unauthorized modifications and additions. In 1997, building violations indicate the conversion of sheds and various outbuildings into living spaces, and the addition of electrical and septic mechanisms without permits. Moreover, unpermitted additions were added to the residence in 2002. County records indicate an unpermitted greenhouse was added and removed from the site in 2018 (Sonoma County 1985; Sonoma County 1997a; Sonoma County 1997b; Sonoma County 1997c; Sonoma County 2002a; Sonoma County 2002b; Sonoma County 2008).

***B7. Moved?** ☒ No ☐ Yes ☐ Unknown

Date: N/A

Original Location: N/A

***B8. Related Features:** N/A

B9a. Architect: N/A

b. Builder: N/A

***B10. Significance:**

Theme: N/A

Area: N/A

Period of Significance: N/A

Property Type: N/A

Applicable Criteria: N/A

(See continuation sheet.)

B11. Additional Resource Attributes: N/A

***B12. References:** See continuation sheet.

B13. Remarks: N/A

***B14. Evaluator:**

Nicole Felicetti, ICF
201 Mission Street, Suite 1500
San Francisco, CA 94105

***Date of Evaluation:** July 19, 2022

(This space reserved for official comments.)

(Sketch Map with north arrow required)

See page 4, Sketch Map

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
LOCATION MAP

Primary # _____
HRI # _____
Trinomial _____

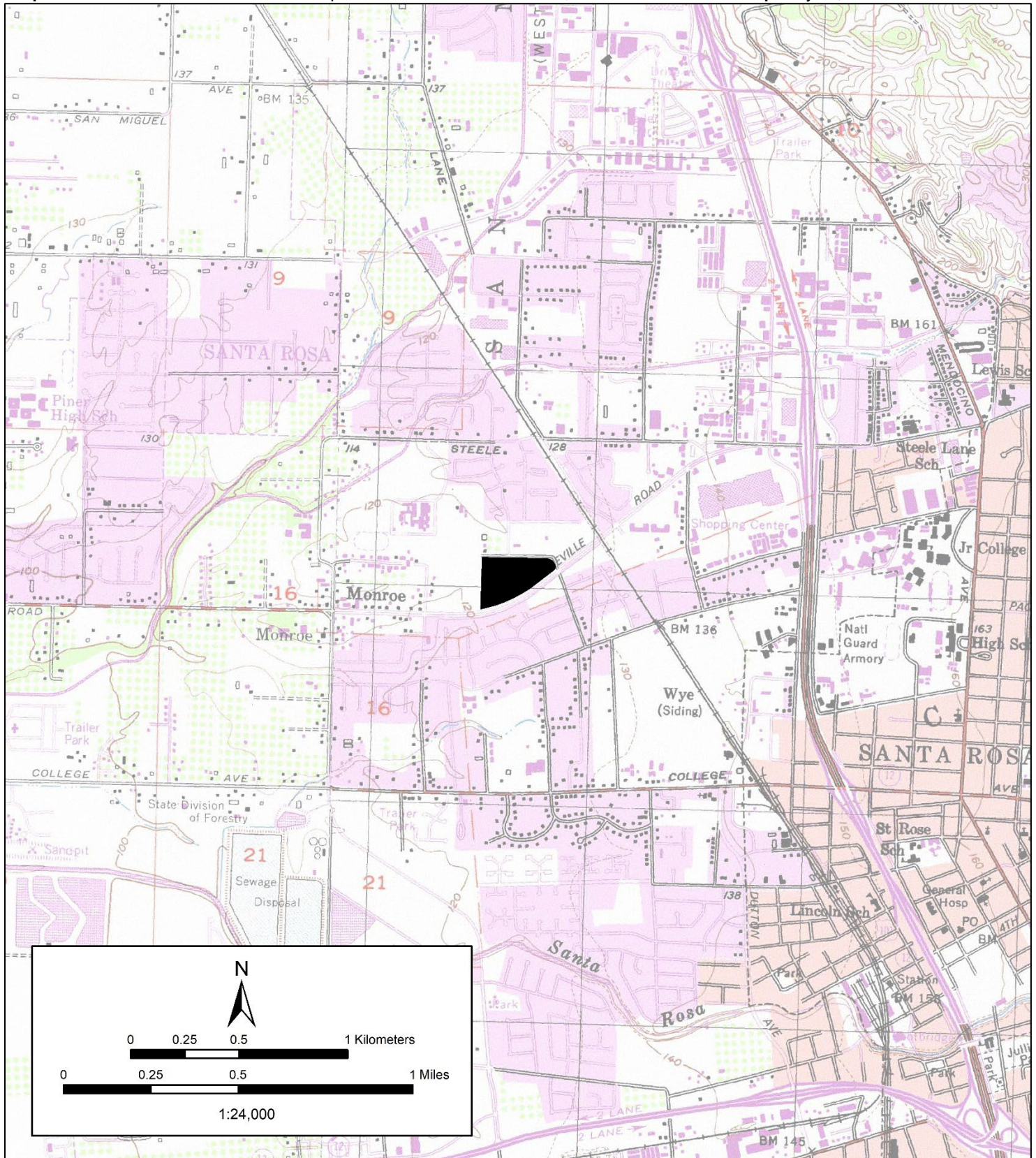
Page 3 of 14

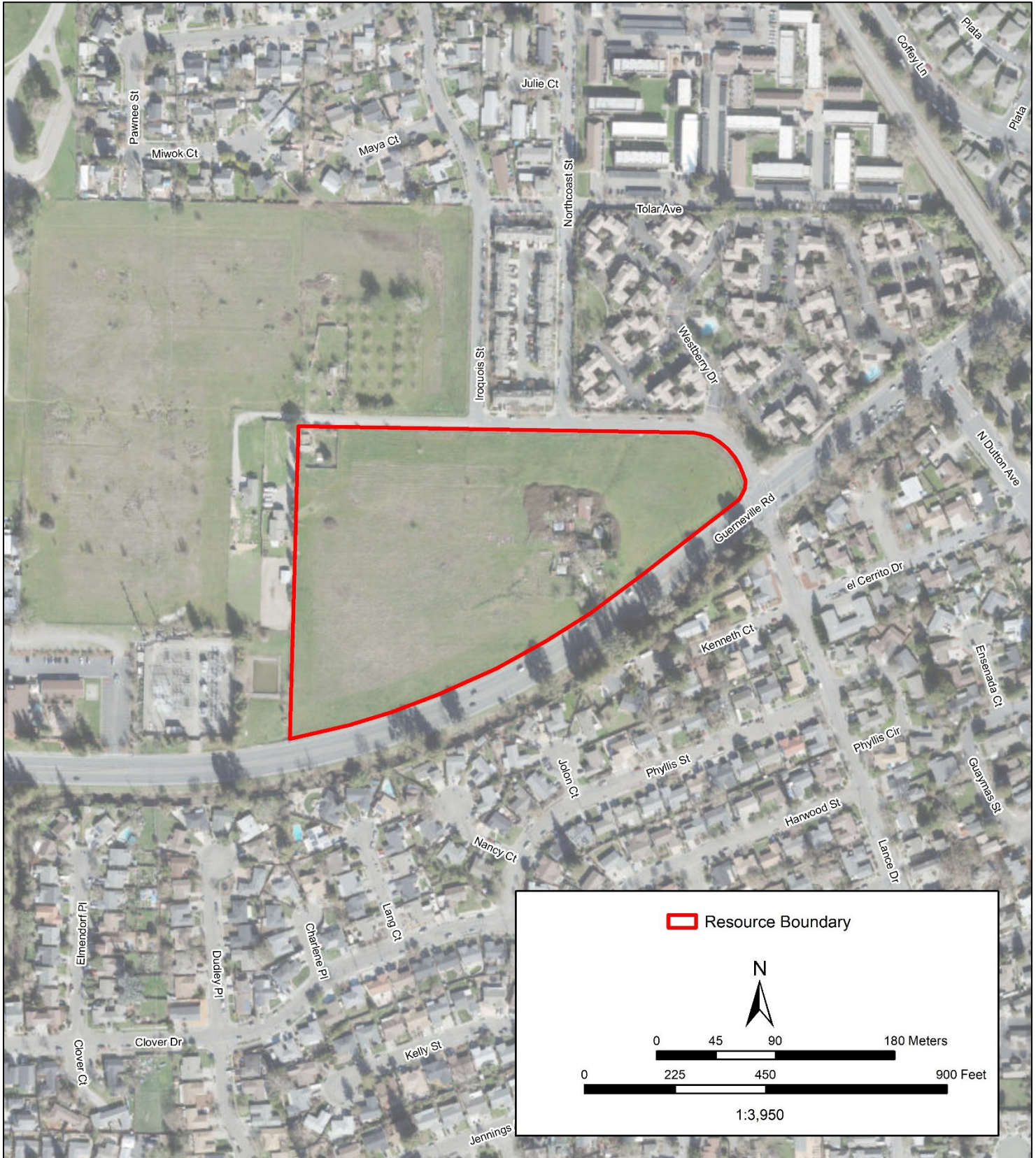
*Map Name: 1601 Lance Drive Location Map

*Scale: 1:24,000

*Resource Name or #: 1601 Lance Drive

*Date of Map: July 27, 2022





*Recorded by: Nicole Felicetti, ICF

*Date: July 19, 2022

☒ Continuation ☐ Update

P3a. Description (continued):

The one-story residence has an irregular-shaped footprint, vertical wood siding, and a steep, cross-gabled roof with modest eaves. A shed roof partially covers the deck projecting from the south facade, facing Guerneville Road. Much of the residence is obscured by debris and trees, though visible single and double window openings appear to have wood frames but are boarded over. The south facade faces Lance Drive and appears to have a large entrance covered by large boards of wood. The roofs appear to be covered with asphalt. The residence is generally in a deteriorated state, with chipped siding, boarded openings, and surrounding debris.

The remaining buildings on the site are generally utilitarian in style and form. Most buildings have wood siding and gabled roofs of corrugated metal or what appear to be large asphalt panels. Most visible openings from the public right-of-way are boarded up, and the general condition of the various outbuildings is poor. Much of the surrounding vegetation is unmaintained and overgrown around the site (**Figures 5-8**).

The three additional buildings at the northwest corner of the parcel are largely obscured from the public right-of-way by a wood fence and dense foliage along the northern parcel boundary. The buildings appear to be residences with small rectangular footprints, simple massing, and modest materials. The cluster of three buildings abuts the western end of Lance Drive, adjacent to the 1680 Lance Drive parcel. Two of the buildings have vertical wood siding, gabled shingle roofs, paneled wood doors, multi-pane windows—either casement or sliding—and decorative wood trim around doors, windows, and roof lines. The third building appears to have corrugated metal walls and a corrugated metal, shed roof. A door opening, vent, and attached lighting fixture are visible on the east façade from the public right-of-way. A wood fence surrounds the cluster of three buildings, separating it from the rest of the parcel. The cluster of buildings appears to be in relatively good condition.

***B10. Significance (continued):**

Development of Sonoma County and Santa Rosa Industries at the Turn of the 20th Century

Santa Rosa, California, is located approximately 60 miles north of San Francisco and is the current county seat of Sonoma County. The earliest permanent development of Santa Rosa was a general store on Rancho Cabeza de Santa Rosa, Maria Carrillo's Mexican land grant, in 1851. This commercial node expanded into a 70-acre town the following year and occupied additional land acquired from Maria's son Julio Carrillo. Santa Rosa Township was founded in 1853, became the county seat of Sonoma County in 1854, and was incorporated in 1867 (Sonoma County: Permit Sonoma n.d.(a)). Beginning in 1855, Santa Rosa's original 70 acres of small and medium-sized farms and ranches were subdivided into smaller parcels for private ownership (Parry 2011).

Santa Rosa's population rapidly increased with the introduction of the railroad in 1870. With the service of the Southern Pacific Railroad and the San Francisco and North Pacific Railroad, Santa Rosa grew from a small farming community to a regional commercial center (LeBaron et al. 1985). Healdsburg Avenue, renamed Mendocino Avenue in 1904-1905, became a major north-south artery through Santa Rosa for both local and commuter travel. The roadway spurred residential development into the early 20th century through the subdivision of historic land grants into smaller residential and agricultural parcels. The State of California later constructed State Route 101 along the route of Mendocino Avenue, though 101 was rebuilt in the mid-1950s as a federal highway and elevated freeway approximately one-half mile to the west of its previous location (Sonoma County: Permit Sonoma n.d.(a)). Although it no longer carries a national highway, Mendocino Avenue has been widened to four lanes and remains a busy thoroughfare through Santa Rosa (Parry 2011). Moreover, State Highway 101 runs through Santa Rosa and services major cities and towns throughout the county (Sonoma County: Permit Sonoma n.d.(a)).

Santa Rosa is located at the center of agriculturally rich Sonoma County; with the help of railroads and national highways, the surrounding area has undergone waves of residential and agricultural development. Santa Rosa specifically has served as a transportation hub that facilitated the shipment of Sonoma County's agricultural products south to San Francisco markets. Wheat and potato farming, hops production, fruit growing, and dairying became some of the county's most prevalent agricultural activities from the 1880s to the mid-20th century. Access to railroads also led to the establishment of processing plants and factories near the rail lines. Canneries, fruit drying plants, and wineries became prominent ancillary industries beginning in the late 19th century and drew even more residents to Sonoma County (Bloomfield 1989:27; LeBaron et al. 1985:3). Before major rail, much of Sonoma County's orchard fruit—prunes, pears, and apricots—were dried and canned locally; after the proliferation of railroads, much of the fruit was shipped to outside canneries. Throughout the 20th century, fruit orchards were gradually replaced with vineyards (Allebach 2015).

Major ethnic groups that populated Sonoma County and contributed to the growing agricultural industry included the Irish, Germans, and smaller European contingents, in addition to African American, Native American, Japanese, and Chinese groups. Italian immigrants also flocked to Sonoma County in large numbers beginning in approximately 1885 and often found work in the county's top three products of the time: dairying, agricultural produce, and basalt quarrying (Allebach 2015). Much of the Italian population settled in the area along the San Francisco and North Pacific Railroad tracks and west of Santa Rosa Creek (LeBaron et al. 1985:83-86). Although they do not seem to have

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*Resource Name or #: 1601 Lance Drive

*Recorded by: Nicole Felicetti, ICF

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☒ Continuation ☐ Update

dominated large-scale viticulture and winemaking in the immediate Santa Rosa area, they established smaller businesses and residential wineries throughout ethnic enclaves in and around Santa Rosa.

Site History

The subject property at 1601 Lance Drive was a part of the Rancho San Miguel in the 19th century, and later within the smaller Williams Tract subdivision. In 1911, landowners Elizabeth Williams, Robert D. Williams, and Edson H. Williams subdivided the tract into nine parcels. The Northwestern Pacific Railroad was located directly east of the parcels, and the Rancho Cabeza de Santa Rosa land grant was located to the south (then the northern boundary of the Jennings Farm and today Guerneville Road) (Sonoma County 1911) (**Figure 2**). The parcel containing the subject property was previously designated as Lots 8 and 9 of the Williams Tract.

The parcel appears to have been used for agriculture in the early 20th century, although research has not identified additional details on its original or early operations. Research has not identified the parcel's early residents, the types of produce that were grown in its fields, or whether any other agricultural activities took place. Records at the Permit Sonoma Planning Department indicate the parcel was originally zoned "A- Agriculture" and became A1 (Primary Agriculture) during a zoning code update in the 1970s. Zoning designations were realigned to the Sonoma County General Plan in the early 1990s, and the parcel was specified as Agriculture and Residential (AR). The AR zone provides lands for raising crops and farm animals in areas designated primarily for rural residential use (Sonoma County 2022).

Morris and Mildred Kishner owned the property prior to 1965, although a review of available Sonoma County deed records did not identify when the Kishners acquired it (Sonoma County 1965). From 1965 to 1970, the property was owned by Anthony Acquistapace. The Acquistapace family had multiple land holdings in the vicinity throughout the 1960s, including 1696 Lance Drive to the north of the subject property (*Press Democrat* 1960:9). Following Acquistapace's death, the property was granted to his sons August and Joseph Anthony Acquistapace, and his daughter Dorothy Tesconi (Sonoma County 1970). August and Joseph Anthony Acquistapace were occupants of 1601 Lance Drive at the time of their inheritance (*Press Democrat* 1969:32). Joseph Tesconi, likely the husband of Dorothy, owned the adjacent property on the east side of Lance Drive in 1973 (**Figure 3**). The Charles D. Tesconi & Dorothy E. Trust assumed ownership of 1601 Lance Drive in 1993 (Sonoma County 1993).

The extant shed was added to the property between 1968 and 1982. Moreover, various outbuildings were added and removed throughout the latter decades of the 20th century, always located in a tight cluster around the residence. Historic aerial photographs throughout the latter half of the century do not indicate any development or agricultural use (NETR 1952, 1968, 1982, 1983, 1993, 2005, 2010, 2018). In the late 20th century, much of the Acquistapace family's land in the vicinity was subdivided into the Westberry Condominiums, a large-scale residential development by the Westberry Limited Partnership that currently surrounds the subject parcel.

National Register of Historic Places and California Register of Historical Resources Evaluation of 1601 Lance Drive

The following section evaluates the subject property to determine whether it meets the eligibility criteria for listing in the National Register of Historic Places (NRHP) and California Register of Historical Resources (CRHR) as an individual resource. In order to be eligible for listing in the NRHP and CRHP, a property must demonstrate significance under one or more of the following criteria:

- Criteria A/1 (Events): Resources that are associated with events that have made a significance contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States.
- Criteria B/2 (Persons): Resources that are associated with the lives of persons important to local, California, or national history.
- Criteria C/3 (Design/Construction): Resources that embody the distinctive characteristics of a type, period, region, or method of construction, or represent the work of a master, or possess high artistic values.
- Criteria D/4 (Information Potential): Resources that have yielded, or have the potential to yield, information important to the prehistory or history of the local area, California, or the nation.

CRITERIA A/1 (EVENTS)

The 1601 Lance Drive property does not appear to be associated with any event(s) significant to the residential and agricultural development of rural Sonoma County, or other notable themes in local, California, or national history. The property has contained a private residence, various outbuildings, and agricultural fields since the early-to-mid 20th century. The subdivision of the parcel from the early-20th-century Williams Tract, originally a part of the San Miguel Rancho, was not a catalyst for a distinct pattern of residential development in the area but rather represents the gradual subdivision and development of land across Sonoma County. The subject property remains a low-density and unincorporated "island" surrounded by residential development, but it does not appear to be a significant example of a 20th-century agricultural property. Although few details on the property's earliest owners and agricultural operations were identified through historical

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research, the property appears to represent a small-scale farm that is unremarkable within the context of Sonoma County agricultural development. Even though agriculture is a significant historic context theme in the county because it contributed heavily to the local economy of the late 19th and early 20th centuries, the agricultural nature of the subject property alone does not warrant NRHP/CRHR eligibility. A significant agricultural property would clearly be linked to early or large-scale production that could be shown to have influenced the local economy or social patterns. The subject property, rather, appears to have contributed generally to a larger pattern of agricultural production, and the current degraded and abandoned condition of the property limits its ability to fully convey its original operations. As such, the 1601 Lance Drive property is not significant under NRHP/CRHR Criteria A/1.

CRITERIA B/2 (PERSONS)

The 1601 Lance Drive property does not appear to be associated with the productive life of any individual(s) important to Santa Rosa built heritage, or, more broadly, in history at the local, state, or national levels of significance. Based on research conducted through the Sonoma County History and Genealogy Library's archival collections, Newspapers.com, Ancestry.com, and other accessible public records, 1601 Lance Drive has no associations with notable figures of local, state, or national histories. Deed research at the Sonoma County Clerk's Office indicated the parcel was a part of the much larger Williams Tract, owned by Elizabeth Williams, Robert D. Williams, and Edson H. Williams until 1911, and was later owned by members of the Kishner and Acquistapace families in the mid-20th century. Historic research using City Directories did not reveal the professions of the Kishner, Acquistapace, and Tesconi families, but the lack of information on these individuals in newspapers and other historical sources indicates they had limited influence on patterns of history that might imbue historical significance. As such, the 1601 Lance Drive property appears to lack a direct association with any significant individual and is not significant under NRHP/CRHR Criteria B/2.

CRITERIA C/3 (DESIGN/CONSTRUCTION)

The 1601 Lance Drive property does not embody distinctive characteristics of a type, period, or method of construction, nor does it appear to be associated with the work of a known master architect or builder. The remaining residence and various outbuildings are utilitarian in design and lack architectural distinction in form, configuration, and ornamentation. A residence with an irregular-shaped footprint, vertical wood siding, a steep, cross-gabled roof with modest eaves, and various roof materials does not cohesively indicate or exemplify a significant 20th-century residential style or building typology. Additionally, the surrounding cluster of a barn, shed, garage, and various outbuildings further reflect the generic use and configuration of a ubiquitous utilitarian agricultural property. No evidence in the available historical record or field survey suggests that the property is a distinct or the sole remaining example of a vernacular residential building with outbuildings constructed in the Santa Rosa area during the early-to-mid 20th century. Although research did not reveal the identities of the building's original architect and builder, it is unlikely that a master designer was involved in what appears to be the remnants of a utilitarian residence and various outbuildings. As such, the 1601 Lance Drive property is not significant under NRHP/CRHR Criteria C/3.

CRITERIA D/4 (INFORMATION POTENTIAL)

The 1601 Lance Drive property is not significant under NRHP/CRHR Criteria D/4, which most commonly applies to archaeological resources. The historic context is well documented in historical sources. As such, the subject property would not fill any data gaps and would not yield information important to prehistory or history and does not appear significant under NRHP Criterion D or CRHR Criterion 4.

In conclusion, the resource was evaluated in accordance with Section 15064.5(a)(2)-(3) of the California Environmental Quality Act (CEQA) Guidelines using the criteria outlined in Section 5024.1 of the California Resources Code, and it appears not to be an individual historical resource for the purposes of CEQA.

*B12. References:

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*Recorded by: Nicole Felicetti, ICF

*Date: July 19, 2022

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*Resource Name or #: 1601 Lance Drive

*Recorded by: Nicole Felicetti, ICF

*Date: July 19, 2022

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Primary # _____
HRI # _____
Trinomial _____

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***Resource Name or #:** 1601 Lance Drive

***Recorded by:** Nicole Felicetti, ICF

***Date:** July 19, 2022

☒ Continuation ☐ Update

Figures:

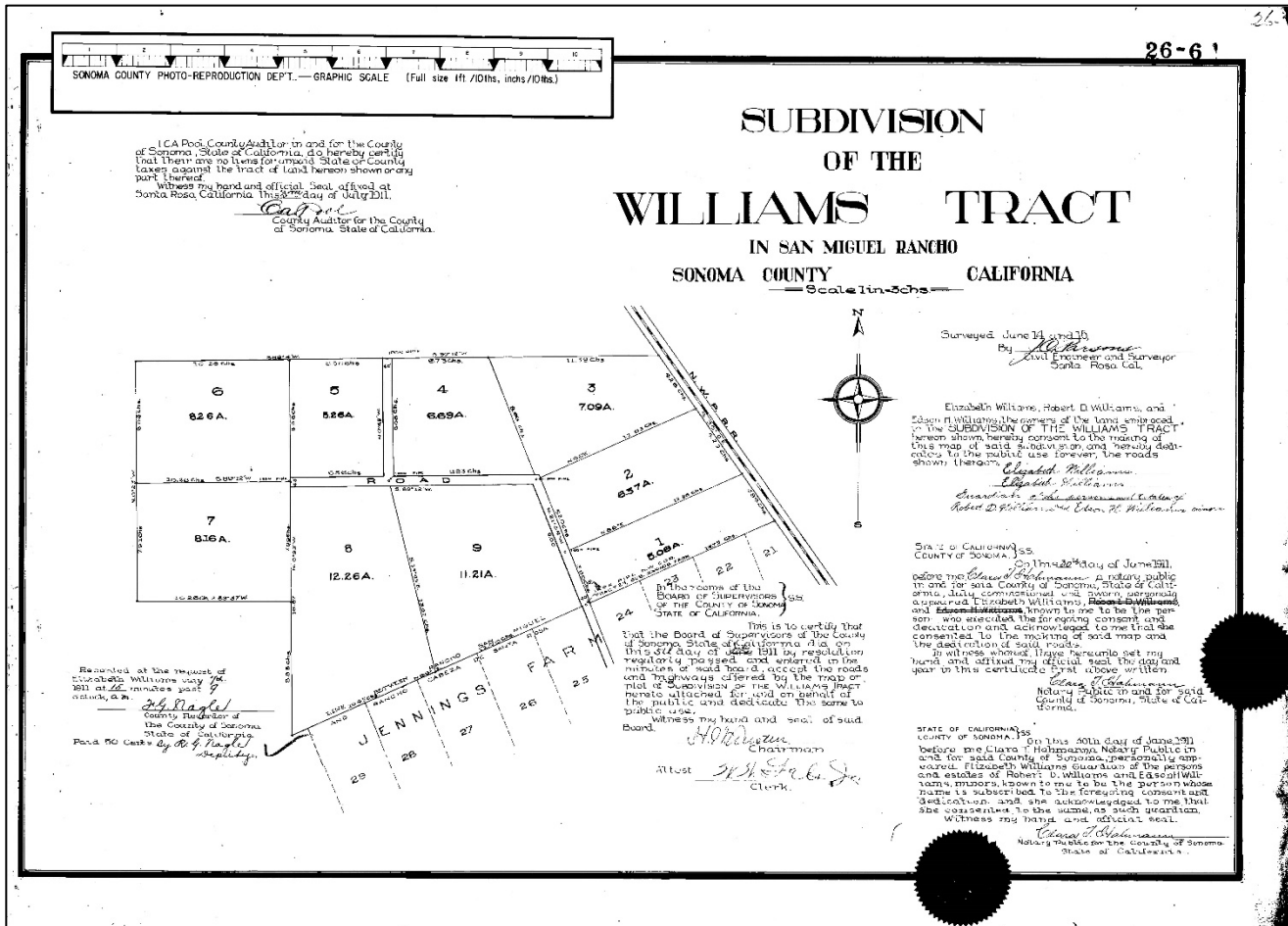


Figure 2. 1911 Subdivision of the William Tract, originally the San Miguel Rancho land plot; the subject property is located on Lots 8 and 9.. Source: Sonoma County: Clerk-Recorder Office.

*Recorded by: Nicole Felicetti, ICF

*Date: July 19, 2022

☒ Continuation ☐ Update

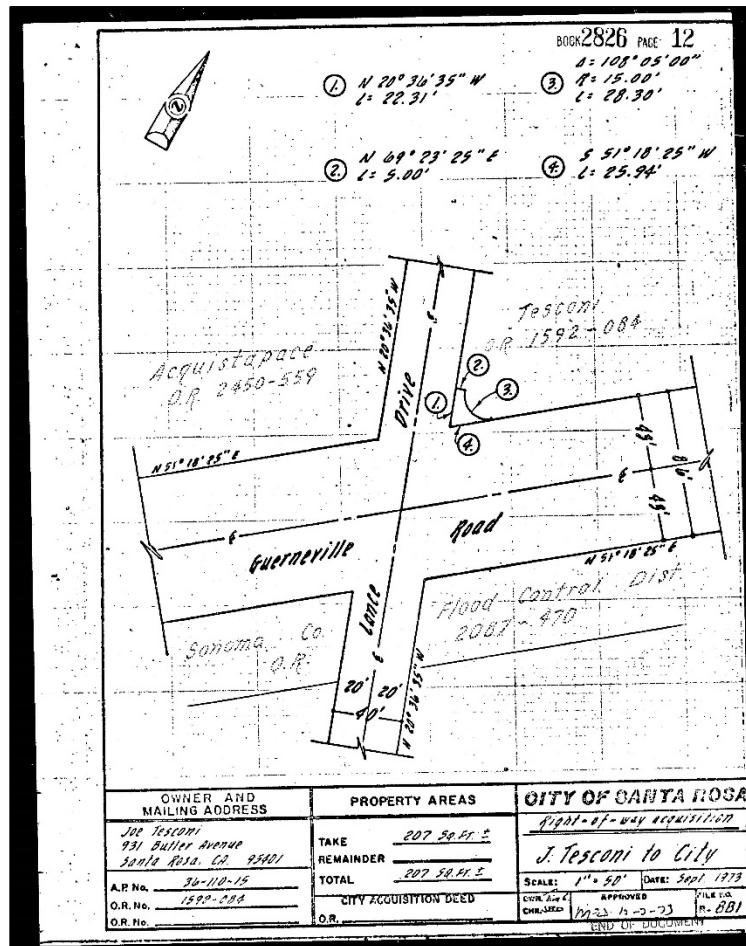


Figure 3. 1973 Right-of-way Acquisition of the land at the Guerneville Road and Lance Drive involving Tesconi landowners, Acquistapace landowners, and the City of Santa Rosa. Source: Sonoma County: Clerk-Recorder Office.

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*Resource Name or #: 1601 Lance Drive

*Recorded by: Nicole Felicetti, ICF

*Date: July 19, 2022

☒ Continuation ☐ Update

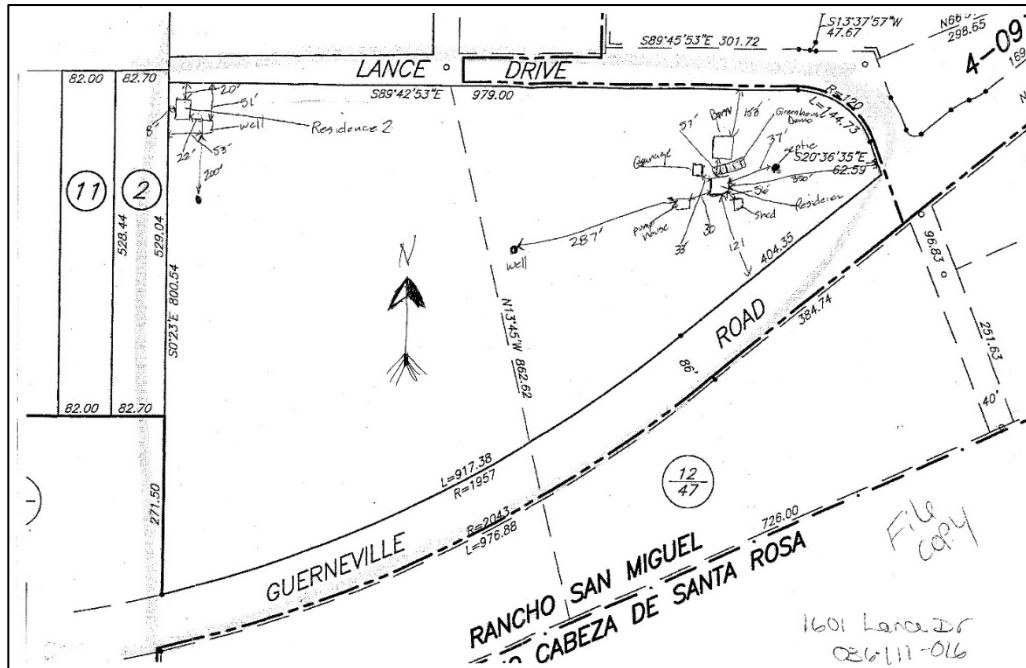


Figure 4. 2018 Supplementary land use map in a 1601 Lance Drive demolition permit of an existing greenhouse.
Source: Sonoma County: Permit Sonoma.



Figure 5. The southwest corner of the primary building partially obscured by a wood fence, viewed facing northwest from Guerneville Road. Source: ICF 2022.

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*Resource Name or #: 1601 Lance Drive

*Recorded by: Nicole Felicetti, ICF

*Date: July 19, 2022

☒ Continuation ☐ Update



Figure 6. An obscured view of the east elevations and roofs of the various outbuildings viewed facing northwest from Guerneville Road. Source: ICF 2022.



Figure 7. The east elevations and roofs of the various outbuildings and surrounding landscaping viewed facing west from Guerneville Road. Source: ICF 2022.

*Recorded by: Nicole Felicetti, ICF

*Date: July 19, 2022

☒ Continuation ☐ Update



Figure 8. The north elevations of the various outbuildings viewed facing south from Lance Drive. Source: ICF 2022.

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # _____
HRI # _____
Trinomial _____
NRHP Status Code _____

Other Listings _____
Review Code _____ Reviewer _____ Date _____

Page 1 of 11

*Resource Name or #: 1696 Lance Drive

P1. Other Identifier:

*P2. Location: ☐ Not for Publication ☒ Unrestricted

*a. County Sonoma

*b. USGS 7.5' Quad: Santa Rosa Date 2021 T 8N R 8W ; ¼ of ¼ of Sec 30 B.M. MDB&M

c. Address: 1696 Lane Drive City Santa Rosa Zip 95401

d. UTM: Zone 10 S; 382720.85 mE/ 1224433.55 mN

e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate) APN: 036-111-010-000; Unincorporated Sonoma County.

***P3a. Description:**

1696 Lance Drive is a former agricultural property located in unincorporated Sonoma County northwest of the intersection of Lance Drive and Iroquois Street. The property contains one large wood barn, one small wood outbuilding, a small, covered structure, and what appear to be the remnants of a rectangular foundation that may belong to a demolished residence (**Figure 1**). A chain link fence with regularly spaced wood posts surrounds the largely open yard around the buildings. A small line of what remains of a vertical wood fence is in disrepair adjacent to the southeast corner of the barn. The property is approximately 5.3-acres and is owned by the Dorothy E. and Charles D. Tesconi Trust (ParcelQuest 2022). The buildings and structures are set back from the western terminus of Lance Drive. The barn has a rectangular footprint, vertical wood siding, and a steep, gabled shingle roof with a moderate overhang. The south façade faces Lance Drive and appears to have a large entrance boarded with large boards of wood. One window opening on the east façade has a wood frame but no glass panes. No openings punctuate the west facade. The north façade is not visible from the public right-of-way and could not be inspected. The barn is deteriorated, with chipped siding, sagging shingles, boarded openings, and vandalized exterior walls.

(See continuation sheet.)

*P3b. Resource Attributes: HP32. Rural open space; HP33. Farm/ranch

*P4. Resources Present: ☒ Building ☐ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other

P5a. Photograph or Drawing



P5b. Description of Photo:

(Figure 1) Remnants of the original buildings, viewed facing north from Lance Drive, Source: ICF 07/13/2022

***P6. Date Constructed/Age and Sources:**

☒ Historic ☐ Prehistoric ☐ Both

Three buildings were constructed at an undetermined date between 1911 and 1952 (Sonoma County 1911:6; NETR 1952; UCSB 1953).

***P7. Owner and Address:**

Charles D. Tesconi & Dorothy E Trust
PO Box 1537
Windsor, CA 95492-1537

***P8. Recorded by:**

Nicole Felicetti, ICF
201 Mission Street, Suite 1500
San Francisco, CA 94105

*P9. Date Recorded: July 19, 2022

*P10. Survey Type: Intensive

*P11. Report Citation: ICF. 2022. Alta Santa Rosa Project Historical Assessment. August. (ICF 104518.0.001) San Francisco, CA. Prepared for Wood Partners, Sausalito, California.

*Attachments: ☐ NONE ☒ Location Map ☒ Sketch Map ☒ Continuation Sheet ☒ Building, Structure, and Object Record ☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record

BUILDING, STRUCTURE, AND OBJECT RECORD

Primary # _____
HRI # _____

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*NRHP Status Code: 6Z

*Resource Name or #: 1696 Lance Drive

B1. Historic Name: 1696 Lance Drive

B2. Common Name: 1696 Lance Drive

B3. Original Use: Residential and agricultural

B4. Present Use: Vacant, zoned residential/agricultural

***B5. Architectural Style:** Utilitarian

***B6. Construction History:**

Four buildings at 1696 Lance Drive were constructed at an undetermined date between 1911 and 1952, based on review of historical maps and aerial photographs (Sonoma County 1911:6; NETR 1952). A small orchard was also in place by 1952. By 1968, the largest building at the parcel's southwest corner (possibly a residence) was removed, and at least two small outbuildings were added to the property. Additionally, Lance Drive was paved to reach the parcel's southwest corner. Additional outbuildings were added and removed throughout the latter decades of the 20th century. A chain-link fence surrounding the entirety of the parcel was also added at an undetermined date. The building at the northwest corner of the parcel was removed between 1993 and 2005 (NETR 1952, 1968, 1983, 2005, 2010, 2018). A wood fence with a smaller rectangular footprint around the remaining building was added to the property between 2015 and 2019, but the majority of posts were removed as of 2022 (Google Earth Pro 2015, 2019). Building permits and architectural drawings were not on record at the Permit Sonoma Planning Department; however, county records indicate the property has suffered fire damage, dilapidation, vegetation overgrowth, and failed maintenance (Sonoma County 2020a; Sonoma County 2020b).

***B7. Moved?** ☒ No ☐ Yes ☐ Unknown

Date: N/A

Original Location: N/A

***B8. Related Features:** N/A

B9a. Architect: N/A

b. Builder: N/A

***B10. Significance:**

Theme: N/A

Area: N/A

Period of Significance: N/A

Property Type: N/A

Applicable Criteria: N/A

(See continuation sheet.)

B11. Additional Resource Attributes: N/A

***B12. References:** See continuation sheet.

B13. Remarks: N/A

***B14. Evaluator:**

Nicole Felicetti, ICF
201 Mission Street, Suite 1500
San Francisco, CA 94105

(Sketch Map with north arrow required)

See page 4, Sketch Map

***Date of Evaluation:** July 19, 2022

(This space reserved for official comments.)

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
LOCATION MAP

Primary # _____
HRI # _____
Trinomial _____

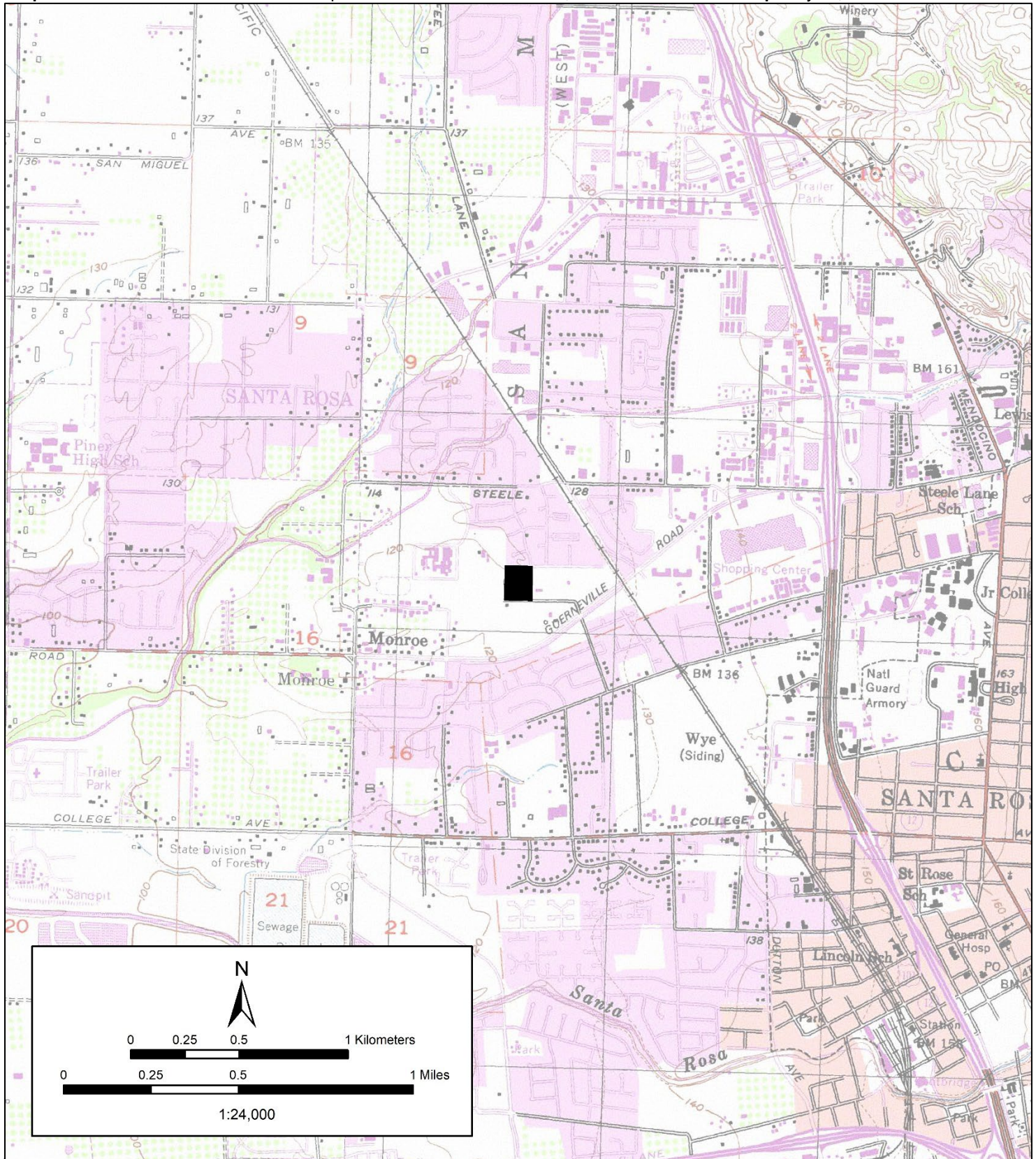
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*Resource Name or #: 1696 Lance Drive

*Map Name: 1696 Lance Drive Location Map

*Scale: 1:24,000

*Date of Map: July 27, 2022





*Recorded by: Nicole Felicetti, ICF

*Date: July 19, 2022

☒ Continuation ☐ Update

***P3a. Description (continued):**

The small wood outbuilding is located between the barn and Lance Drive. The polygonal entrance at the south façade is partially framed by metal posts; no other openings are visible. A wood-board shed roof covers the outbuilding. An unenclosed structure to the west of the primary building has four wood posts on each corner and a corrugated metal panel roof. The remnants of a wood fence, what appears to be a building foundation, and other building materials are scattered around the primary building. The remainder of the parcel has overgrown grass, brush, and trees. To the east of the buildings and wood fence—though still within the greater chain link fence of the parcel's boundary—there is a small grid of trees. The tree configuration suggests the land was once an orchard, but the tree species is unidentified, and the trees no longer bear fruit (**Figures 3-6**).

***B10. Significance (continued):**

Development of Sonoma County and Santa Rosa Industries at the Turn of the 20th Century

Santa Rosa, California, is located approximately 60 miles north of San Francisco and is the current county seat of Sonoma County. The earliest permanent development of Santa Rosa was a general store on Rancho Cabeza de Santa Rosa, Maria Carrillo's Mexican land grant, in 1851. This commercial node expanded into a 70-acre town the following year and occupied additional land acquired from Maria's son Julio Carrillo. Santa Rosa Township was founded in 1853, became the county seat of Sonoma County in 1854, and was incorporated in 1867 (Sonoma County: Permit Sonoma n.d.(a)). Beginning in 1855, Santa Rosa's original 70 acres of small and medium-sized farms and ranches were subdivided into smaller parcels for private ownership (Parry 2011).

Santa Rosa's population rapidly increased with the introduction of the railroad in 1870. With the service of the Southern Pacific Railroad and the San Francisco and North Pacific Railroad, Santa Rosa grew from a small farming community to a regional commercial center (LeBaron et al. 1985). Healdsburg Avenue, renamed Mendocino Avenue in 1904-1905, became a major north-south artery through Santa Rosa for both local and commuter travel. The roadway spurred residential development into the early 20th century through the subdivision of historic land grants into smaller residential and agricultural parcels. The State of California later constructed State Route 101 along the route of Mendocino Avenue, though 101 was rebuilt in the mid-1950s as a federal highway and elevated freeway approximately one-half mile to the west of its previous location (Sonoma County: Permit Sonoma n.d.(a)). Although it no longer carries a national highway, Mendocino Avenue has been widened to four lanes and remains a busy thoroughfare through Santa Rosa (Parry 2011). Moreover, State Highway 101 runs through Santa Rosa and services major cities and towns throughout the county (Sonoma County: Permit Sonoma n.d.(a)).

Santa Rosa is located at the center of agriculturally rich Sonoma County; with the help of railroads and national highways, the surrounding area has undergone waves of residential and agricultural development. Santa Rosa specifically has served as a transportation hub that facilitated the shipment of Sonoma County's agricultural products south to San Francisco markets. Wheat and potato farming, hops production, fruit growing, and dairying became some of the county's most prevalent agricultural activities from the 1880s to the mid-20th century. Access to railroads also led to the establishment of processing plants and factories near the rail lines. Canneries, fruit drying plants, and wineries became prominent ancillary industries beginning in the late 19th century and drew even more residents to Sonoma County (Bloomfield 1989:27; LeBaron et al. 1985:3). Before major rail, much of Sonoma County's orchard fruit—prunes, pears, and apricots—were dried and canned locally; after the proliferation of railroads, much of the fruit was shipped to outside canneries. Throughout the 20th century, fruit orchards were gradually replaced with vineyards (Allebach 2015).

Major ethnic groups that populated Sonoma County and contributed to the growing agricultural industry included the Irish, Germans, and smaller European contingents, in addition to African American, Native American, Japanese, and Chinese groups. Italian immigrants also flocked to Sonoma County in large numbers beginning in approximately 1885 and often found work in the county's top three products of the time: dairying, agricultural produce, and basalt quarrying (Allebach 2015). Much of the Italian population settled in the area along the San Francisco and North Pacific Railroad tracks and west of Santa Rosa Creek (LeBaron et al. 1985:83-86). Although they do not seem to have dominated large-scale viticulture and winemaking in the immediate Santa Rosa area, they established smaller businesses and residential wineries throughout ethnic enclaves in and around Santa Rosa.

Site History

The subject property at 1696 Lance Drive was a part of the Rancho San Miguel in the late 19th century, and later within the smaller Williams Tract subdivision. In 1911, landowners Elizabeth Williams, Robert D. Williams, and Edson H. Williams subdivided the tract into nine parcels. The Northwestern Pacific Railroad was located directly to the east of the parcels, and the Rancho Cabeza de Santa Rosa land grant was located to the south (then northern boundary of the Jennings Farm and today Guerneville Road) (Sonoma County 1911) (**Figure 2**). The parcel containing the subject property was previously designated as Lot 5 of the Williams Tract.

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The parcel appears to have been used for agriculture in the early 20th century, although research has not identified additional details on its original or early operations. The gridded arrangement of trees on the site indicates it was at one time an orchard. Its early owners and occupants remain unknown. Records at the Permit Sonoma Planning Department indicate the parcel was originally zoned "A- Agriculture" and became A1 (Primary Agriculture) during a zoning code update in the 1970s. Zoning designations were realigned to the Sonoma County General Plan in the early 1990s, and the parcel was specified as Agriculture and Residential (AR). The AR zone provides lands for raising crops and farm animals in areas designated primarily for rural residential use (Sonoma County 2022).

The subject property at 1696 Lance Drive was a part of the Acquistapace family's land holdings that included much of the surrounding area north of Guerneville Road in the mid-20th century. Pietro Acquistapace lived at 1696 Lance Drive from an undetermined year to 1960 (*Press Democrat* 1960:9). In 1969, Antonio Acquistapace was one of the property's occupants as well as the owner of the 1601 Lance Drive property immediately to the south. August and Joseph Anthony Acquistapace, as well as Dorothy Tesconi, inherited 1601 Lance Drive, and the Tesconi family remains the current owner of both 1601 Lance Drive and 1696 Lance Drive (*Press Democrat* 1969:32; ParcelQuest 2022). Only one deed tied to the Assessor Parcel Number was available at the Sonoma County Clerk's Office, indicating the property remained in the Tesconi family since at least 1993 (Sonoma County 1993). Although much of Acquistapace family's former land in the vicinity was subdivided into the Westberry Condominiums in the late 20th century, a large-scale residential development by the Westberry Limited Partnership, the subject property has remained largely undeveloped.

National Register of Historic Places and California Register of Historical Resources Evaluation of 1696 Lance Drive

The following section evaluates the subject property to determine whether it meets the eligibility criteria for listing in the National Register of Historic Places (NRHP) and California Register of Historical Resources (CRHR) as an individual resource. In order to be eligible for listing in the NRHP and CRHP, a property must demonstrate significance under one or more of the following criteria:

- Criteria A/1 (Events): Resources that are associated with events that have made a significance contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States.
- Criteria B/2 (Persons): Resources that are associated with the lives of persons important to local, California, or national history.
- Criteria C/3 (Design/Construction): Resources that embody the distinctive characteristics of a type, period, region, or method of construction, or represent the work of a master, or possess high artistic values.
- Criteria D/4 (Information Potential): Resources that have yielded, or have the potential to yield, information important to the prehistory or history of the local area, California, or the nation.

CRITERIA A/1 (EVENTS)

The 1696 Lance Drive property does not appear to be associated with any event(s) significant to the residential and agricultural development of rural Sonoma County, or other notable themes in local, California, or national history. The property has contained agricultural buildings and an orchard since the early-to-mid 20th century. The subdivision of the parcel from the early-20th-century Williams Tract, originally a part of the San Miguel Rancho, was not a catalyst for a distinct pattern of residential development in the area but rather represents the gradual subdivision and development of land across Sonoma County. The subject property remains a low-density and unincorporated "island" surrounded by residential development, but it does not appear to be a significant example of a 20th-century agricultural property. Although few details on the property's earliest owners and agricultural operations were identified through historical research, the property appears to represent a small-scale farm that is unremarkable within the context of Sonoma County agricultural development. Even though agriculture is a significant historic context theme in the county because it contributed heavily to the local economy of the late 19th and early 20th centuries, the agricultural nature of the subject property alone does not warrant NRHP/CRHR eligibility. A significant agricultural property would clearly be linked to early or large-scale production that could be shown to have influenced the local economy or social patterns. The subject property, rather, appears to have contributed generally to a larger pattern of agricultural production, and the current degraded and abandoned condition of the property limits its ability to fully convey its original operations. As such, the 1696 Lance Drive property is not significant under NRHP/CRHR Criteria A/1.

CRITERIA B/2 (PERSONS)

The 1696 Lance Drive property does not appear to be associated with the productive life of any individual(s) important to Santa Rosa built heritage, or, more broadly, in history at the local, state, or national levels of significance. Based on research conducted through the Sonoma County History and Genealogy Library's archival collections, Newspapers.com, Ancestry.com, and other accessible public records, 1696 Lance Drive has no associations with notable figures of local, state, or national histories. Deed research at the Sonoma County Clerk's Office indicated the parcel was a part of the much larger Williams Tract, owned by Elizabeth Williams, Robert D. Williams, and Edson H.

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Williams until 1911 and was later owned by members of the Acquistapace family in the mid-20th century. Historic research into City Directories did not reveal the professions of members of the Acquistapace and Tesconi families, but the lack of information on these individuals in newspapers and other historical sources indicates they had limited influence on patterns of history that might imbue historical significance. As such, the 1696 Lance Drive property appears to lack a direct association with any significant individual and is not significant under NRHP/CRHR Criteria B/2.

CRITERIA C/3 (DESIGN/CONSTRUCTION)

The 1696 Lance Drive property does not embody distinctive characteristics of a type, period, or method of construction, nor does it appear to be associated with the work of a known master architect or builder. The remaining features are utilitarian in design and lack architectural distinction in form, configuration, and ornamentation. A rectangular footprint, vertical wood siding, a steep, gabled shingle roof with a moderate overhang, and modest window openings do not cohesively indicate or exemplify a significant 20th-century style or building typology, but rather are utilitarian building elements. The extant outbuilding and unenclosed structure are simple auxiliary resources that are typical of agricultural properties that contain a residence and productive fields. No evidence in the available historical record or field survey suggests that the property is a distinct or the sole remaining example of an agricultural property constructed in the Santa Rosa area during the early-to-mid 20th century. Although the research did not reveal the identities of the building's original architect and builder, it is unlikely that a master designer was involved in what appears to be utilitarian agricultural outbuildings. As such, the 1696 Lance Drive property is not significant under NRHP/CRHR Criteria C/3.

CRITERIA D/4 (INFORMATION POTENTIAL)

The 1696 Lance Drive property is not significant under NRHP/CRHR Criteria D/4, which most commonly applies to archaeological resources. The historic context is well documented in historical sources. As such, the subject property would not fill any data gaps and would not yield information important to prehistory or history and does not appear significant under NRHP Criterion D or CRHR Criterion 4.

In conclusion, the resource was evaluated in accordance with Section 15064.5(a)(2)-(3) of the California Environmental Quality Act (CEQA) Guidelines using the criteria outlined in Section 5024.1 of the California Resources Code, and it appears not to be an individual historical resource for the purposes of CEQA.

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State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
CONTINUATION SHEET

Primary # _____
HRI # _____
Trinomial _____

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*Resource Name or #: 1696 Lance Drive

*Recorded by: Nicole Felicetti, ICF
*Date: July 19, 2022

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Figures:

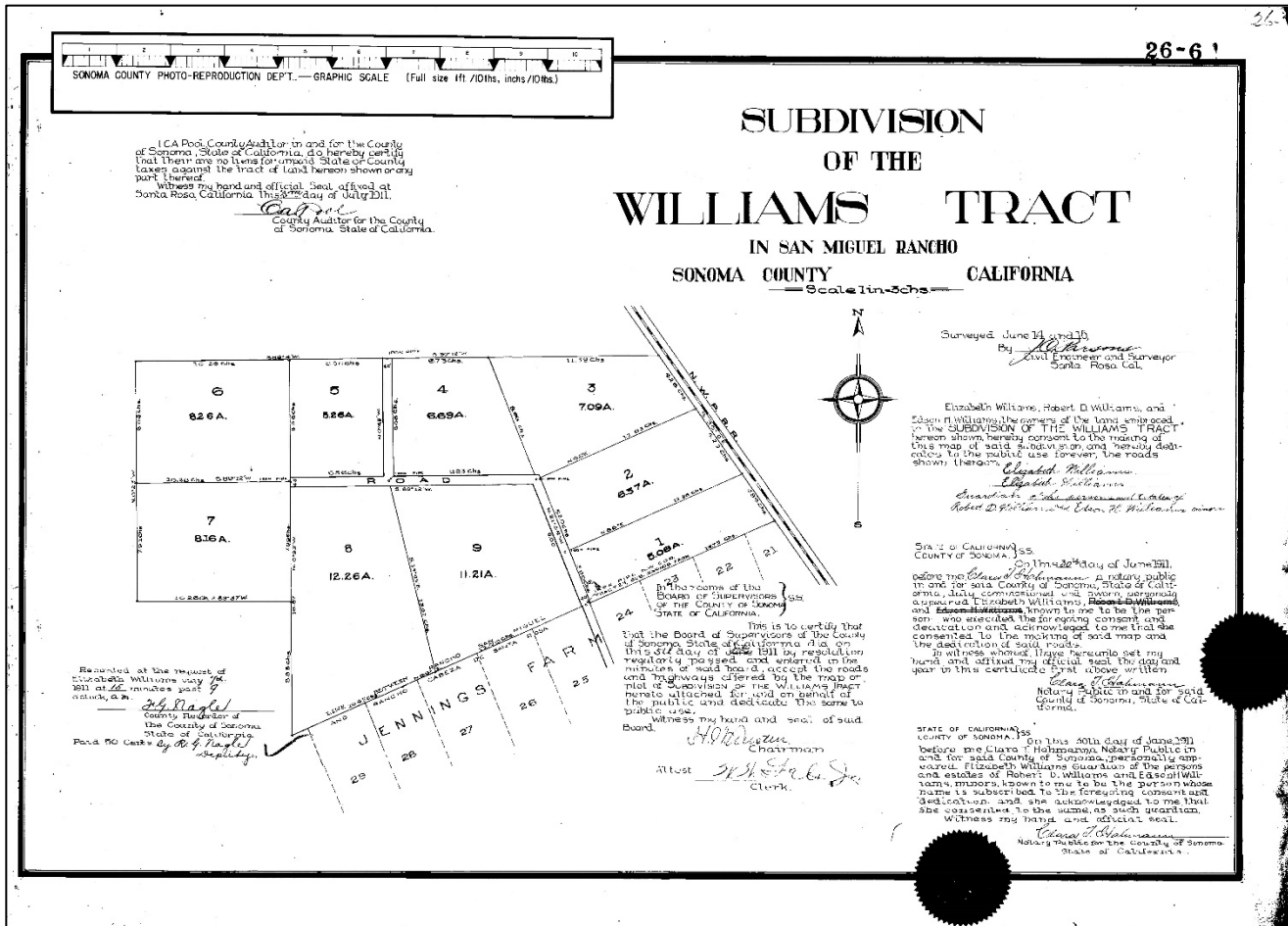


Figure 2. 1911 Subdivision of the William Tract, originally the San Miguel Rancho land plot. The subject property was Lot 5. Source: Sonoma County: Clerk-Recorder Office.

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Figure 3. The southwest corner of the primary barn and an unenclosed wood and corrugated metal structure viewed facing northeast from Lance Drive. Source: ICF 2022.



Figure 4. An obscured view of the southeast corner and east elevation of the primary wood building, deteriorated state of the surrounding chain-link fence, and surrounding remnant orchard, viewed facing northwest from Lance Drive. Source: ICF 2022.

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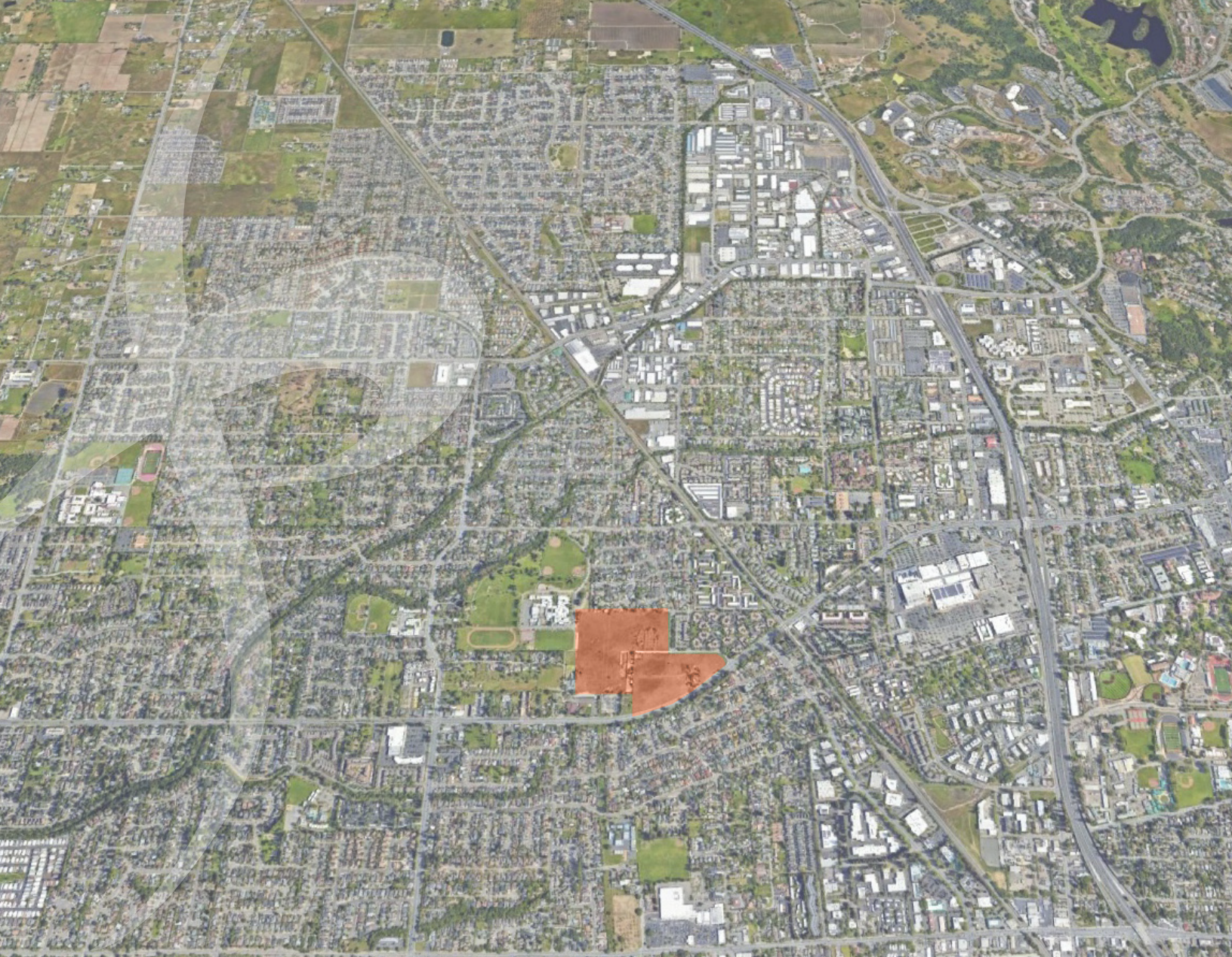


Figure 5. The small wood outbuilding, viewed north from Lance Drive. Source: ICF 2022.



Figure 6. Grid of trees east of the buildings, viewed west from Iroquois Street. Source: ICF 2022.

Transportation Impact Analysis



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July 2024

DRAFT

Transportation Impact Analysis

Lance Drive Project

Prepared for:
Pacific Development
City of Santa Rosa

Draft

Lance Drive Project

Traffic Operations Analysis

Prepared for:
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July 22, 2024

WC23-4012.02

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EXECUTIVE SUMMARY

This report presents the results of the traffic operations analysis prepared for the proposed mixed-use residential and neighborhood-serving commercial project located along Lance Drive in an unincorporated area of southeastern Sonoma County. The site is anticipated to be incorporated into the City of Santa Rosa in Fall 2024. The existing Project site is primarily undeveloped but does include two single-family homes and associated structures. Adjacent uses include residential, commercial/retail, and institutional (i.e., school and church) uses. The proposed Project includes construction of up to 772 residential units (100 single-family homes and 672 apartments), and about 5,000 square feet of commercial space. On-site parking demand is proposed to be served by approximately 1,491 parking spaces. The Project also proposes to complete and enhance the neighborhood sidewalk network by constructing standard sidewalks along the Project frontage.

VMT SCREENING ASSESSMENT

With the passage of Senate Bill 743 (SB 743), the use of criteria such as automobile delay, level of service, and similar measures of vehicle capacity of traffic congestion as the basis for determining significant impacts as part of California Environmental Quality Act (CEQA) compliance was eliminated. SB 743 mandates the use of VMT in the evaluation and assessment of significant transportation impacts. In June 2020, Santa Rosa adopted VMT-based analysis methods which includes VMT metrics, thresholds, and screening criteria for evaluating a project's VMT impact. Based on the City thresholds and screening criteria, a project can be screened out from a formal VMT analysis if certain criteria are met that would signify that a project would be presumed to result in a less-than-significant CEQA Transportation section impact with respect to VMT. A project's impact on VMT is considered less-than-significant and should not require further VMT analysis if the project meets at least one of the following criteria (based on the City of Santa Rosa's thresholds adopted June 2020):

Small Infill Projects: With 110 or fewer daily trips

Map-Based Screening for Residential and Office Projects: Low-VMt generating areas

Near Transit Station: Within one-half mile of an existing major transit stop or an existing stop along a high-quality transit corridor (CEQA Guidelines section 15064.3(b)(1))

Affordable Housing: 100% affordable housing



Local-Serving Retail: Projects including retail uses up to a combined total of 10,000 gross square feet

Mixed-Use Projects: Evaluate each component independently and apply the significance threshold for each project type (residential/retail). Alternatively, consider only the project's dominant use.

Local-Serving Public Facilities (excluding schools): Publicly-owned local-serving facilities such as: Library, Community Center, City Hall, Public Safety Station, Passive Parks, Public Utilities Offices, or Infrastructure

The Project is approximately 0.2 miles from the Santa Rosa North SMART Station. Additionally, the retail component of the Project is about 5,000 square feet, which is under the 10,000 gross square feet threshold. Therefore, the proposed Project satisfies the City-established screening criteria for a project near a transit station and local-serving retail and may be presumed to result in a **less-than-significant** VMT impact without further analysis.

CIRCULATION SYSTEM CEQA IMPACTS

The Project, as currently proposed, would provide access to the public circulation system through the use of one driveway on Guerneville Road, two driveways on Lance Drive, and three driveways on Iroquois Street. An additional emergency vehicle access only driveway would be provided at the north property line at the end of Pawnee Street. Sight distance along Guerneville Road, Lance Drive, and Iroquois Street appear to be adequate. The Project proposes to construct a Class I facility along the Project boundary on Guerneville Road, providing direct access to the Project site. There are no features on site that would be hazardous to pedestrian or bicycle travel, and the Project does not conflict with any pedestrian or bicycle facilities plans or programs. Therefore, there are no significant adverse impacts identified to the Project's circulation system.

SITE ACCESS AND CIRCULATION RECOMMENDATIONS (NON-CEQA)

The following recommendations have been developed to improve site access and circulation for all modes of travel. These recommendations are not for CEQA mitigation purposes and were developed to assist in addressing on-site access and circulation:

Site Access and Vehicular Circulation

1. Review and confirm adequacy of sight distance for driveway access points



2. Confirm adequacy of the site's design for emergency vehicle movement through the internal roadways of Project and confirm final site plan review by the Fire Marshall

Pedestrian and Bicycle Access and Circulation

3. Construct sidewalk(s) to meet City's design and ADA standards

Transit Access and Circulation

4. Confirm that the primary bus stops serving the Project site are ADA compliant

INTERSECTION OPERATIONS (NON-CEQA)

Table E-1 provides a summary of the informational, non-CEQA analysis of study intersections. Signalized intersections within the study area run on adaptive signals. Adaptive signals dynamically change their signal timings to respond to the volume of vehicles; these changes happen dynamically within the peak period, and therefore change on a day-to-day basis. For the level of service analysis, three cycle lengths were tested in order to reflect this type of operation. All intersections operate within the bounds of cycle lengths between 95 seconds and 140 seconds.



TABLE E-1: SUMMARY OF INTERSECTION OPERATIONS

	Intersection	Intersection Operating Within City Standards?		
		Existing With Project	Near Term With Project	Cumulative With Project
1	Marlow Road/West Steele Lane	Yes	Yes	Yes
2	Iroquois Street-Apple Valley Lane/West Steele Lane	Yes	Yes	Yes
3	Range Avenue/West Steele Lane	Yes	Yes	Yes
4	Guerneville Road/Marlow Road	Yes	Yes	Yes
5	Guerneville Road/Ridley Avenue	Yes	Yes	Yes
6	Guerneville Road/Lance Drive	Yes	Yes	Yes
7	Guerneville Road/North Dutton Avenue	Yes	Yes	Yes
8	Guerneville Road/Coffey Lane	Yes	Yes	Yes
9	Guerneville Road/Range Avenue	Yes	Yes	Yes
10	Guerneville Road/Steele Way	Yes	Yes	Yes
11	Guerneville Road/Cleveland Avenue	Yes	Yes	Yes
12	Guerneville Road/US 101 Southbound Ramps	Yes	Yes	Yes
13	Guerneville Road/US 101 Northbound Ramps	Yes	Yes	Yes
14	Marlow Road-Stony Point Road/West College Avenue	Yes	Yes	Yes
15	North Dutton Avenue/West College Avenue	Yes	Yes	Yes
16	Lance Drive/Iroquois Street	Yes	Yes	Yes
17	Iroquois Street/Project Driveway (1)	Yes	Yes	Yes
18	Iroquois Street/Project Driveway (2)	Yes	Yes	Yes
19	Lance Drive/Project Driveway (3)	Yes	Yes	Yes
20	Guerneville Road/Project Driveway (4)	Yes	Yes	Yes

Source: Fehr & Peers, June 2024.

The Project's study intersections are projected to operate within the City's established standards as shown in **Table E-1**. The addition of traffic associated with the Project to the study intersections was not found to result in violations of any of the applicable LOS policies.



1.0 INTRODUCTION

This report presents the results of the Traffic Operations Analysis for the proposed Lance Drive Project (the "Project") located off Lance Drive in an unincorporated area of southeastern Sonoma County. The site is anticipated to be incorporated into the City of Santa Rosa in Fall 2024. The proposed Project includes construction of up to 772 residential units (100 single-family homes and 672 apartments) and about 5,000 square feet of commercial space, to be served by 1,491 parking spaces. The Project would take access to the public street system through the use of driveways along Guerneville Road, Lance Drive, and Iroquois Street. The Project also proposes to construct a Class I facility along the Project boundary on Guerneville Road. One emergency vehicle access only driveway would be provided at the north property line at the end of Pawnee Street.

The Project site plan is presented on **Figure 1**.

1.1 CEQA TRANSPORTATION ANALYSIS

The Project is being analyzed under the City's *Vehicle Miles Traveled (VMT) Guidelines* (June 2020) and the auspices of the California Environmental Quality Act (CEQA). For the CEQA Transportation section, projects are generally required to respond to the following CEQA Guidelines Appendix G checklist questions:

Would the project:

- Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities?
- Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?
- Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g. farm equipment)?
- Result in inadequate emergency access?

Criterion B is the formal implementation of the Senate Bill 743 (SB 743) requirement to analyze VMT as part of the CEQA Transportation section. Under SB 743, congestion related project effects (such as those measured by Level of Service or similar metrics) are deemed to be less-than-significant by statute. Relevant subsections of CEQA Guidelines section 15064.3(b) for the project read as follows:

Land Use Projects. *Vehicle-miles traveled exceeding an applicable threshold of significance may indicate a significant impact. Generally, projects within one-half mile of either an existing major transit stop or a stop along an existing high-quality transit corridor should be presumed to cause a*



less than significant transportation impact. Projects that decrease vehicle-miles traveled in the project area compared to existing conditions should be presumed to have a less than significant transportation impact.

Methodology. *A lead agency has discretion to choose the most appropriate methodology to evaluate a project's vehicle miles traveled, including whether to express the change in absolute terms, per capita, per household or in any other measure. A lead agency may use models to estimate a project's vehicle miles traveled and may revise those estimates to reflect professional judgment based on substantial evidence. Any assumptions used to estimate vehicle miles traveled and any revisions to model outputs should be documented and explained in the environmental document prepared for the project. The standard of adequacy in Section 15151 shall apply to the analysis described in this section.*

As noted above, the City of Santa Rosa, in its discretion as lead agency, has the ability to select the methodology and CEQA significance criteria for use in the CEQA Transportation section. CEQA significance criteria are provided in **Section 1.2**.

1.2 CEQA VMT ANALYSIS

The City of Santa Rosa's *Vehicle Miles Traveled Final Draft Guidelines* (June 2020) provide for a seven land use type VMT screening process, as follows:

1. Small Infill Projects: 110 or fewer daily vehicle trips, office projects with buildings totaling 11,000 square feet of gross floor area or less, or industrial projects with buildings totaling 22,000 square feet gross floor area or less
2. Map-Based Screening for Residential and Office Projects: Low-VMT generating areas
3. Near Transit Station: Within a half-mile of an existing major transit stop or an existing stop along a high-quality transit corridor
4. Affordable Housing: 100% affordable housing
5. Local-Serving Retail: Projects including retail uses up to a combined total of 10,000 gross square feet
6. Mixed Use Projects: Evaluate each component independently and apply the significance threshold for each project type (residential/retail). Alternatively, consider only the project's dominant use
7. Local-Serving Public Facilities (Excluding Schools): Publicly-owned local-serving facilities such as – Library, Community Center, City Hall, Public Safety Station, Passive Parks, Public Utilities Offices, or Infrastructure



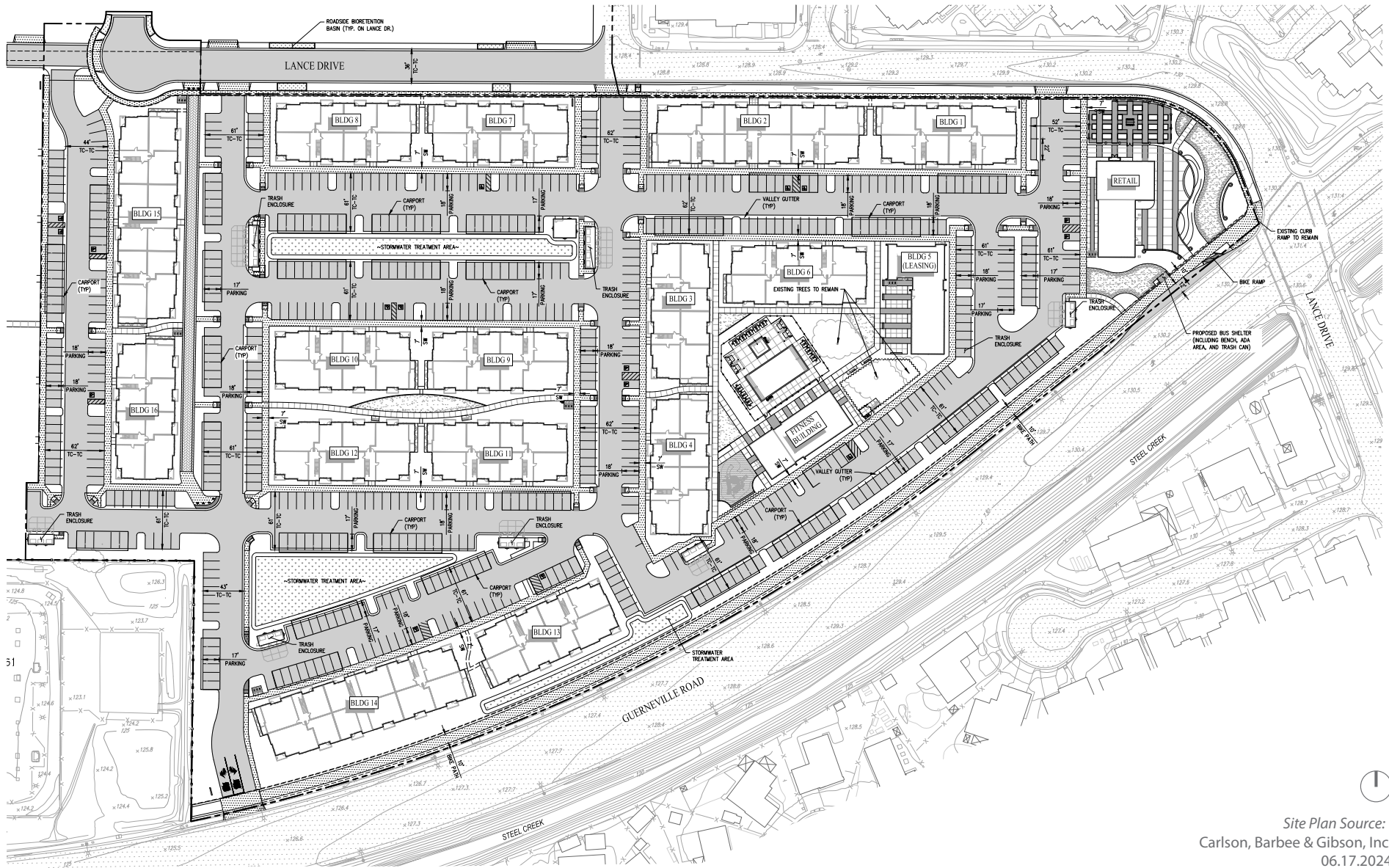
The Project is approximately 0.2 miles from the Santa Rosa North SMART Station. Additionally, the Project's retail component is 5,000 square feet, which is under the 10,000 gross square feet threshold. Therefore, the Project satisfies the City-established screening criteria for a project near a transit station and local-serving retail and may be presumed to result in a **less-than-significant** VMT impact with no further VMT analysis required.

1.3 NON-CEQA INTERSECTION ANALYSIS

CEQA Guidelines §15064.3(a) notes that "a [land use] project's effect on automobile delay shall not constitute a significant environmental impact. Thus, the Project is considered to have no impact when measures by metrics such as Level of Service which assess automobile congestion by statute. However, an informational (i.e., not performed for CEQA purposes) intersection analysis has been performed to aid in understanding if off-site transportation improvements may be beneficial in promoting efficient vehicular circulation in the vicinity of the Project site after implementation of the Project. The intersection analysis parameters are discussed in the following subsections.

1.3.1 INTERSECTION ANALYSIS STUDY AREA

The intersection analysis study area includes key intersections immediately adjacent to the Project site, along with intersections in the vicinity of the Project site where the Project may degrade operations of the transportation network. Intersections within the study area were evaluated during the morning (7:00 to 9:00 AM) and evening (4:00 to 6:00 PM) weekday travel periods. A total of twenty intersections, presented on **Figure 2** and listed in **Table 1**, were selected as study locations in consultation with City staff.



Site Plan Source:
 Carlson, Barbee & Gibson, Inc.
 06.17.2024



Figure 1

Project Site Plan



TABLE 1: STUDY INTERSECTIONS

Int ID	Intersection Name	Jurisdiction	Existing Traffic Control
1	Marlow Road/West Steele Lane	City of Santa Rosa	Signalized
2	Iroquois Street-Apple Valley Lane/West Steele Lane	City of Santa Rosa	Side-Street Stop-Controlled
3	Range Avenue/West Steele Lane	City of Santa Rosa	Signalized
4	Guerneville Road/Marlow Road	City of Santa Rosa	Signalized
5	Guerneville Road/Ridley Avenue	City of Santa Rosa	Signalized
6	Guerneville Road/Lance Drive	City of Santa Rosa	Signalized
7	Guerneville Road/North Dutton Avenue	City of Santa Rosa	Signalized
8	Guerneville Road/Coffey Lane	City of Santa Rosa	Signalized
9	Guerneville Road/Range Avenue	City of Santa Rosa	Signalized
10	Guerneville Road/Steele Way	City of Santa Rosa	Signalized
11	Guerneville Road/Cleveland Avenue	City of Santa Rosa	Signalized
12	Guerneville Road/US 101 Southbound Ramps	City of Santa Rosa Caltrans	Signalized
13	Guerneville Road/US 101 Northbound Ramps	City of Santa Rosa Caltrans	Signalized
14	Marlow Road-Stony Point Road/West College Avenue	City of Santa Rosa	Signalized
15	North Dutton Avenue/West College Avenue	City of Santa Rosa	Signalized
16	Lance Drive/Iroquois Street	City of Santa Rosa	All-Way Stop-Controlled
17	Iroquois Street/Project Driveway (1)	City of Santa Rosa	Side-Street Stop-Controlled
18	Iroquois Street/Project Driveway (2)	City of Santa Rosa	Side-Street Stop-Controlled
19	Lance Drive/Project Driveway (3)	City of Santa Rosa	Side-Street Stop-Controlled
20	Guerneville Road/Project Driveway (4)	City of Santa Rosa	Side-Street Stop-Controlled

Source: Fehr & Peers, June 2024.



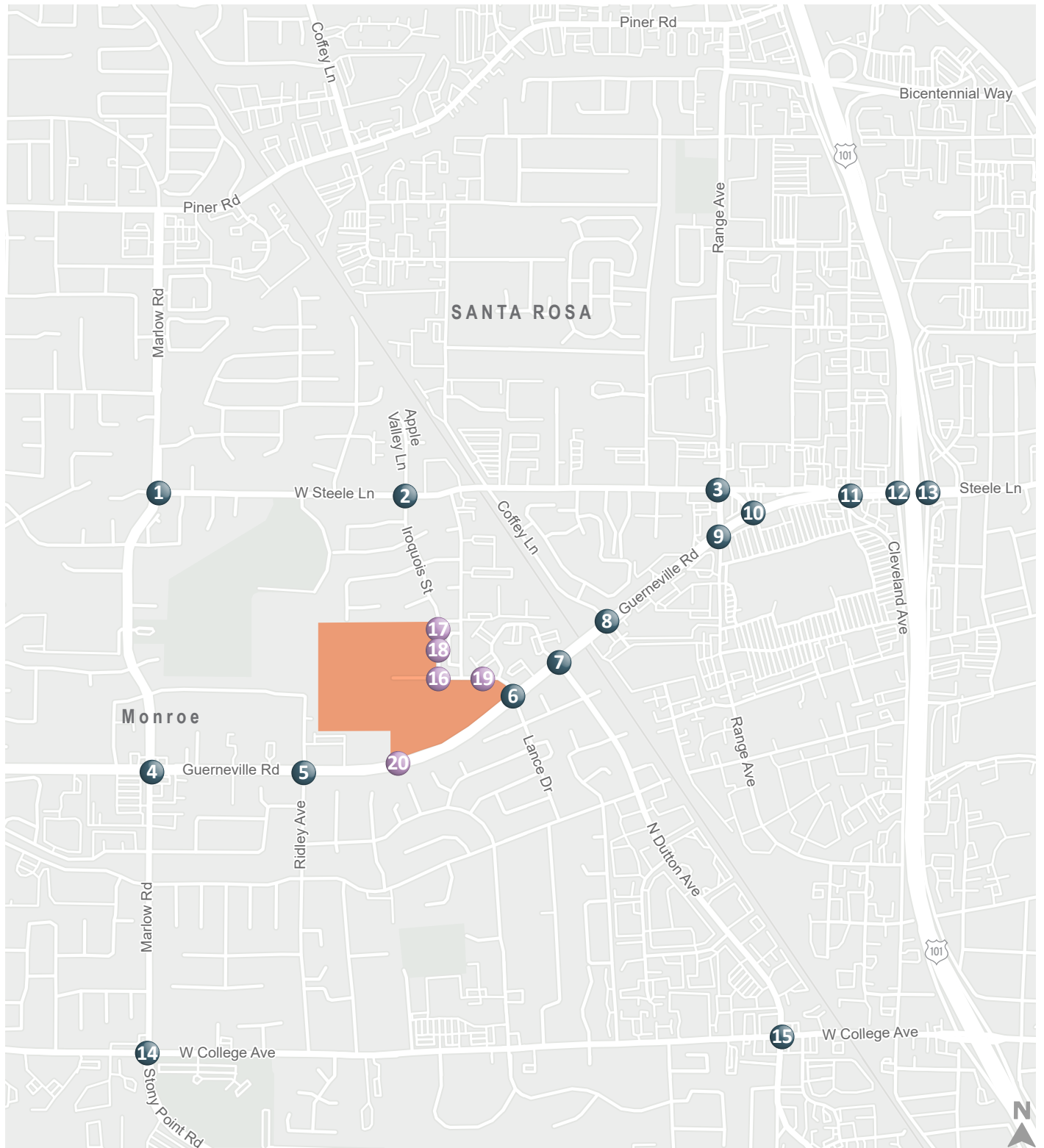
1.3.2 INTERSECTION ANALYSIS SCENARIOS

Study intersections were evaluated for the following scenarios listed in **Table 2**.

TABLE 2: ANALYSIS SCENARIOS

Scenario	Description
Existing	The analysis of Existing Conditions was based on traffic counts provided collected in April 2022, as well as existing lane geometries and signal timings. The existing conditions assessment also includes a description of key study area roadways and an assessment of bicycle, pedestrian, public transit facilities and services near the site.
Existing With Project	This traffic scenario provides an assessment of operating conditions under Existing Conditions with the addition of Project-generated traffic and transportation network infrastructure proposed by the Project. The impacts of the proposed Project on baseline operating conditions were identified.
Near Term Without Project	This traffic scenario provides an assessment of operating conditions under Existing Conditions with the addition of approved projects within the study area that could be constructed over the next five to ten years.
Near Term With Project	This traffic scenario provides an assessment of operating conditions under Near Term Conditions with the addition of Project-generated traffic and transportation network infrastructure proposed by the Project.
Cumulative Without Project	Year 2040 traffic forecasts without the proposed Project were developed for Cumulative Conditions by applying traffic volume growth data derived from the Sonoma County Transportation Authority travel demand model and other data sources. The growth data were applied to Existing Conditions volumes to arrive at Year 2040 traffic volumes.
Cumulative With Project	This traffic scenario provides an assessment of operating conditions under Cumulative Conditions with the addition of Project-generated traffic and transportation network infrastructure proposed by the Project. The impacts of the proposed Project on Year 2040 baseline traffic operating conditions were then identified.

Source: Fehr & Peers, June 2024.



Project Site

 Study Intersection

 Project Driveway Study Intersection



Figure 2

Project Site Vicinity and Study Intersections



1.3.3 INTERSECTION ANALYSIS METHODOLOGY

The operations of roadway facilities are described with the term level of service (“LOS”), a qualitative description of traffic flow based on such factors as speed, travel time, delay, and freedom to maneuver). Six levels are defined from LOS A, as the best operating conditions, to LOS F, or the worst operating conditions. LOS E represents “at-capacity” operations. When traffic volumes exceed intersection capacity, stop-and-go conditions result, and operations are designated as LOS F. Generally, the City of Santa Rosa’s LOS standard (per the General Plan) is LOS D or better along all major corridors (such as Guerneville Road).

1.3.3.1 Signalized Intersections

The method described in Chapter 19 of the Transportation Research Board’s *Highway Capacity Manual*, 6th Edition (HCM 6th Edition) was used to conduct the level of service calculations for the signalized study intersections. This method is used to estimate the control delay experienced by motorists at an intersection. Control delay includes the initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. The average control delay for signalized intersections was calculated using the Synchro traffic analysis software and correlated to a LOS designation as shown in **Table 3**.



TABLE 3: SIGNALIZED INTERSECTION LOS DEFINITIONS

Level of Service	Description	Average Control Delay per Vehicle (seconds)
A	Operations with very low delay occurring with favorable progression and/or short cycle lengths.	< 10.0
B	Operations with low delay occurring with good progression and/or short cycle lengths.	> 10.0 to 20.0
C	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	> 20.0 to 35.0
D	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, and high volume-to-capacity (V/C) ratios. Many vehicles stop and individual cycle failures are noticeable.	> 35.0 to 55.0
E	Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences.	> 55.0 to 80.0
F	Operations with delays unacceptable to most drivers occurring due to over-saturation, poor progression, or very long cycle lengths.	> 80.0

Source: *Highway Capacity Manual, 6th Edition*.

1.3.3.2 Unsignalized Intersections

Operations at unsignalized intersections were evaluated using the methods from the HCM 6th Edition. With this method, operations are defined by the average control delay per vehicle (measured in seconds) for each movement that must yield the right-of-way. At two-way or side street stop-controlled intersections, the control delay (and LOS) is calculated for each controlled movement, the left-turn movement from the major street, and the entire intersection. For controlled approaches composed of a single lane, the control delay is computed as the average of all movements in that lane. The delays for the entire intersection and for the movement or approach with the highest delay are reported. **Table 4** summarizes the relationship between delay and LOS for unsignalized intersections.



TABLE 4: UNSIGNALIZED INTERSECTION LEVEL OF SERVICE DEFINITIONS

Level of Service	Description	Average Control Delay Per Vehicle (Seconds)
A	Little or no delay.	< 10.0
B	Short traffic delays.	> 10.0 to 15.0
C	Average traffic delays.	> 15.0 to 25.0
D	Long traffic delays.	> 25.0 to 35.0
E	Very long traffic delays.	> 35.0 to 50.0
F	Extreme traffic delays with intersection capacity exceeded.	> 50.0

Source: *Highway Capacity Manual, 6th Edition*.

1.3.4 INTERSECTION LEVEL OF SERVICE POLICY

Although not a CEQA metric, intersection levels of service are evaluated in this study for General Plan compliance and to identify potential transportation improvements that could be implemented as part of the Project to improve the overall operations of the transportation system for all travel modes. The City of Santa Rosa's General Plan 2035 and the *Guidance for the Preparation of Traffic Operational Analysis* (July 2019) detail the applicable intersection operations policies. These are presented below.

The proposed Project would not function within the City's adopted standards if:

- For signalized intersections operating acceptably (LOS A, B, C or D) prior to the implementation of the project: the project would cause intersection operations to degrade to LOS E or LOS F
- For signalized intersections operating unacceptably (LOS E or LOS F) prior to the implementation of the project: the project would result in an increase of greater than 5.0 seconds in the average delay at the intersection *and* the number of project trips added to the intersection results in an increase in volume-to-capacity ratio of more than 0.02.

The City of Santa Rosa does not maintain specific criteria for use in the evaluation of unsignalized intersection operations, nor would the City's LOS D policy directly apply because, typically, the stop-controlled approaches at side-street stop-controlled intersections are not major movements.

However, while the relationship between unsignalized study intersections operations and the City's LOS D policy may be somewhat unclear, this exemption does not relieve the need for the determination of potential degradation of the circulation system's operations. Given this context, the following criteria were developed based on local state of the practice and applicable goals and policies in the City's General Plan.

The proposed Project would not function within the City's adopted standards if:



- For unsignalized intersections operating acceptably (LOS A, B, C or D) prior to the implementation of the project: the project would be required to install improvements if both of the following criteria are met:
 - It would cause intersection operations to degrade to LOS E or LOS F
 - The intersection meets California MUTCD Signal Warrant 3A or Warrant 3B (commonly known as the “Peak Hour Signal Warrant”)
- For unsignalized intersections operating unacceptably (LOS E or LOS F) prior to the implementation of the project: the project would be required to install improvements if both of the following criteria are met:
 - The project would result in an increase of greater than 5.0 seconds in the worst approach or worst movement delay at the intersection
 - The intersection meets California MUTCD Signal Warrant 3A or Warrant 3B (commonly known as the “Peak Hour Signal Warrant”)

1.4 REPORT ORGANIZATION

The remainder of this report is organized into the following chapters:

- **Chapter 2: Existing Conditions** describes the existing multimodal transportation system in the Project vicinity, including the surrounding roadway network, peak period intersection turning movement volumes, existing bicycle, pedestrian, and transit facilities, and intersection operations.
- **Chapter 3: Project Trip Generation Estimates** presents the Project trip generation, distribution, and assignment.
- **Chapter 4: Existing with Project Conditions** addresses existing conditions after implementation of the Project, including LOS operations of the circulation system.
- **Chapter 5: Near-Term Conditions** addresses near-term conditions with and without the Project and discusses project vehicular effects.
- **Chapter 6: Cumulative (Year 2040) Conditions** addresses future (Year 2040) conditions with and without the Project and discusses project vehicular effects.
- **Chapter 7: Site Plan Evaluation and Recommendations** discusses multimodal site access, circulation, and parking for the Project.



2.0 EXISTING CONDITIONS

This chapter describes the existing transportation conditions in the study area, including the roadway network and the transit, pedestrian, and bicycle facilities in the vicinity of the Project site.

2.1 ROADWAY SYSTEM

Direct vehicular access to the Project site is provided by Guerneville Road, Lance Drive and Iroquois Street. Local access to the site is provided via Marlow Road, Ridley Avenue, Range Avenue, West Steele Lane, Cleveland Avenue, West College Avenue, and North Dutton Avenue. Regional access to the Project site is provided via the US 101 freeway. These facilities are described below and are illustrated on **Figure 2** (presented earlier in **Section 1.3.1**).

Lance Drive is a two-lane local street along the southeastern frontage of the Project site. The street runs in an east-west direction from Iroquois Street in the west to Guerneville Road in the east, and then north-south from Guerneville Road to the north to West College Avenue in the south. The posted speed limit on the facility near the Project site is 25 miles per hour. No bicycle facilities are provided along Lance Drive; sidewalks are provided for pedestrian use along the facility.

Iroquois Street is a two-lane local street along the northeastern frontage of the Project site. The street runs in a north-south direction from Lance Drive in the south to West Steele Lane in the north; the roadway continues north as Apple Valley Lane. The posted speed limit on the facility near the Project site is 25 miles per hour. No bicycle facilities are provided along Iroquois Street; sidewalks are provided for pedestrian use along the facility.

Guerneville Road is an east-west four-lane arterial street from the City limits in the west to US 101 in the east; the roadway continues east as Steele Lane. In the vicinity of the Project area, Guerneville Road has sidewalks on the north side of the street from Ridley Avenue to Lance Drive, as well as Class II bike lanes. The posted speed limit is 40 miles per hour in the vicinity of the Project site, and on-street parking is prohibited along the roadway.

Marlow Road is a north-south four-lane arterial street that extends from Piner Road in the north to West College Avenue in the south; south of West College Avenue the roadway continues as Stony Point Road. In the vicinity of the study area, Marlow Road has sidewalks on both sides of the street as well as Class II bike lanes. The posted speed limit is 35 miles per hour in the vicinity of the Project site, and on-street parking is prohibited along the roadway.



Ridley Avenue is a two-lane local street that serves residential uses along the corridor. The roadway runs north-south with Guerneville Road in the north and West College Avenue in the south and continues north into a cul-de-sac. The posted speed limit in the vicinity of the Project is 25 miles per hour.

Range Avenue is a two-to-four-lane local street that serves residential and commercial uses along the corridor. The roadway runs north-south with Piner Road in the north to Briggs Avenue in the south; the roadway continues as Frances Street. The posted speed limit in the vicinity of the Project is 30 to 40 miles per hour.

West Steele Lane is a two-lane collector street that serves residential uses along the corridor. The roadway runs east-west with Marlow Road in the west to Mendocino Ave in the east; the roadway continues as Lewis Road. The posted speed limit in the vicinity of the Project is 25 to 35 miles per hour.

Cleveland Avenue is a two-to-four-lane local street that serves residential and commercial uses along the corridor. The roadway runs north-south with US 101 in the north to Ninth Street in the south; the roadway continues as Hopper Avenue and Wilson Street, respectively. The posted speed limit in the vicinity of the Project is 30 to 35 miles per hour.

West College Avenue is a four-lane arterial street that extends from Fulton Road in the east to Fourth Street in the west. The roadway provides sidewalks on both sides of the street, Class II bike lanes in sections along the corridor, and provides access to US 101. The posted speed limit is 35 to 40 miles per hour in the vicinity of the Project site.

North Dutton Avenue is a two-to-four-lane arterial street that serves residential and commercial uses along the corridor. The roadway runs north-south with Guerneville Road in the north and Hearn Avenue in the south. The posted speed limit in the vicinity of the Project is 35 to 40 miles per hour.

US 101 is a six-lane north-south freeway that connects the Project site to destinations throughout central Sonoma, Marin, and Mendocino Counties, with further connections to San Francisco, Los Angeles, and California's North Coast region. In the vicinity of the Project site, US 101 includes high-occupancy vehicle lanes, which require a vehicle occupancy of two or more persons. The on-ramps at the US 101/Guerneville Road-Steele Lane and US 101/College Avenue interchanges are subject to ramp metering during the morning and afternoon commute periods.



2.2 PUBLIC TRANSIT SERVICE

This section summarizes local and regional public transit connectivity in the study area. Public transit systems that serve the study area are discussed below.

- **Santa Rosa CityBus (CityBus):** Santa Rosa CityBus provides local bus service throughout the City of Santa Rosa. The City of Santa Rosa has a subsidized transit passes program for projects of this type that can provide an incentive to travel by non-auto modes. CityBus manages the Coddington Transit Hub, which is about half a mile from the site and is the second largest transit hub in the City of Santa Rosa. The CityBus service includes four routes; Route #1 directly serves downtown Santa Rosa every 15 minutes and Route #15 has bus stops along Guerneville Road directly serving the Project at a 60-minute frequency seven days a week. CityBus has plans to increase the service frequency on Route 15 to 30-minutes with Affordable Housing and Sustainable Communities (AHSC) funding. Various other CityBus routes indirectly serve the Project site. Route 6 stops along West Steele Lane at a 30-minute frequency on weekdays and hourly on Saturday and Sunday. Route 10 also stops along West Steele Lane, but farther from the site and east of the tracks at a 60-minute frequency seven days a week. All routes provide connections to other CityBus and regional transit services, as well as a connection to the North Santa Rosa and Downtown Santa Rosa SMART Stations.

The closest bus stop to the Project site is on the northeast corner of the Lance Drive and Guerneville Road intersection. This bus stop (#80202) is served by Route 15 for westbound boardings only. On Guerneville Road at Ridley Avenue, there are two bus stops (#80227 and 80203) providing both east and west bound boardings for Route 15. Additionally, along West Steele Lane, there are bus stops at Apache Street and Northcoast Street all served by Route 6 providing east and west bound boardings.

- **Sonoma County Transit (SCT):** Sonoma County Transit provides regional bus service in the City of Santa Rosa, with connections to other communities throughout Sonoma County. Four Sonoma County Transit routes (20, 30, 44, and 48) indirectly serve the Project site via transfer service at the Coddington Transit Hub.
- **Sonoma-Marín Area Rail Transit (SMART):** SMART provides regional passenger rail service between the Sonoma County Airport and Larkspur (in Marin County). Future extensions to the service include a northward extension to Cloverdale (authorized by Measure Q) and a longer-term extension to Suisun City (as envisioned in the State Rail Plan). The closest station to the Project site is the Santa Rosa North SMART Station, which is located on Guerneville Road, less than a quarter mile away.
- **Amtrak:** Amtrak provides rail service from Martinez to Arcata. Amtrak serves the Coddington Transit Hub, just over half a mile from the Project site.



2.3 PEDESTRIAN AND BICYCLE FACILITIES

2.3.1.1 Pedestrian Facilities

Pedestrian facilities consist of sidewalks, crosswalks, and pedestrian signals at signalized intersections. The pedestrian environment was evaluated along the connecting roadways that directly serve the Project site and adjacent roadways that connect to transit stops and/or nearby destinations in the greater study area.

Pedestrian connectivity in the vicinity of the Project site is provided along the east side of Lance Drive and Iroquois Street, and a walkway is currently provided along Guerneville Road east of Ridley Avenue to Lance Drive; sidewalks are not provided on the west sides of the Lance Drive and Iroquois Street – these gaps in the sidewalk system are anticipated to be closed as part of the Project, partly to ensure ADA access to transit stops. There are various crosswalk facilities at the study intersections around the Project. The crosswalks across Guerneville Road at Lance Drive and Ridley Avenue, and West Steele Lane at Northcoast Street, Iroquois Street, and Apache Street allow for transit users and other pedestrians to safely cross and access the transit stops nearby. The CityBus transit stops closest to the site, all within a quarter of a mile, include:

- Guerneville Road at Lance Drive (#80202) served by Route 15 westbound
- Guerneville Road at Ridley Avenue (#80203) served by Route 15 westbound
- Guerneville Road at Ridley Avenue (#80227) served by Route 15 eastbound
- West Steele Lane at Apache Street (#80288) served by Route 6 westbound
- West Steele Lane at Apache Street (#80281) served by Route 6 eastbound
- West Steele Lane at Northcoast Street (#80287) served by Route 6 westbound
- West Steele Lane at Northcoast Street (#80282) served by Route 6 eastbound

2.3.1.2 Bicycle Facilities

Chapter 1000 of the Caltrans *Highway Design Manual* identifies the following four bikeway classifications:

- Class I Bikeway (Bicycle Path) provides a completely separate right-of-way and is designated for the exclusive use of bicycles and pedestrians with vehicle and pedestrian cross-flow minimized.

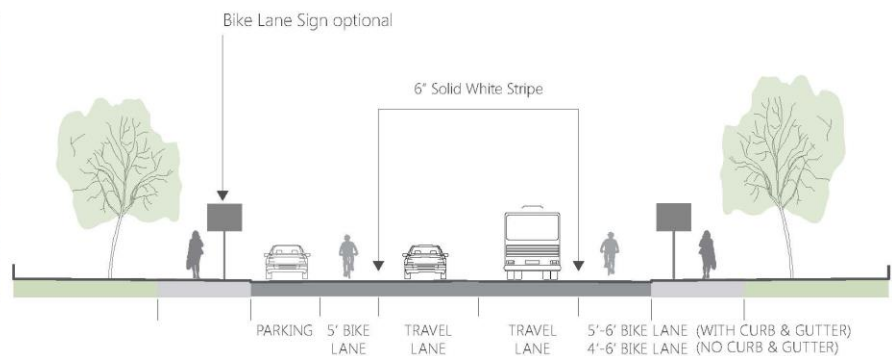


Provides a completely separated right-of-way for the exclusive use of bicycles and pedestrians with cross flow minimized.



- **Class II Bikeway (Bicycle Lane)** provides a restricted right-of-way and is designated for the use of bicycles with a striped lane on a street or highway. Bicycle lanes are generally four to six feet wide. Adjacent vehicle parking and vehicle/pedestrian cross-flow are permitted.

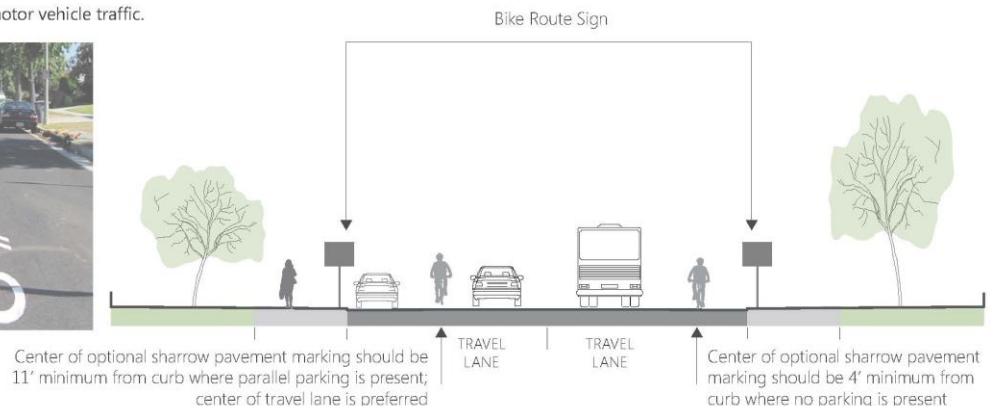
Provides a striped lane for one-way bike travel on a street or highway.



- **Class III Bikeway (Bicycle Route)** provides for a right-of-way designated by signs or pavement markings (sharrows) for shared use with pedestrians or motor vehicles. Sharrows are a type of pavement marking (bike and arrow stencil) placed to guide bicyclists to the best place to ride on the road, avoid car doors, and remind drivers to share the road with cyclists.

With Optional Sharrow Pavement Marking

Provides for shared use with motor vehicle traffic.





- **Class IV Bikeway**, also known as “cycle tracks” or “protected bike lanes,” provide a right-of-way designated exclusively for bicycle travel within a roadway and which are protected from other vehicle traffic with devices, including, but not limited to, grade separation, flexible posts, inflexible physical barriers, or parked cars.



Class II bicycle lanes are provided along Guerneville Road, West Steele Lane, and Marlow Road along the vicinity of the Project site. The Project proposes to construct a Class I facility along the Project boundary on Guerneville Road.

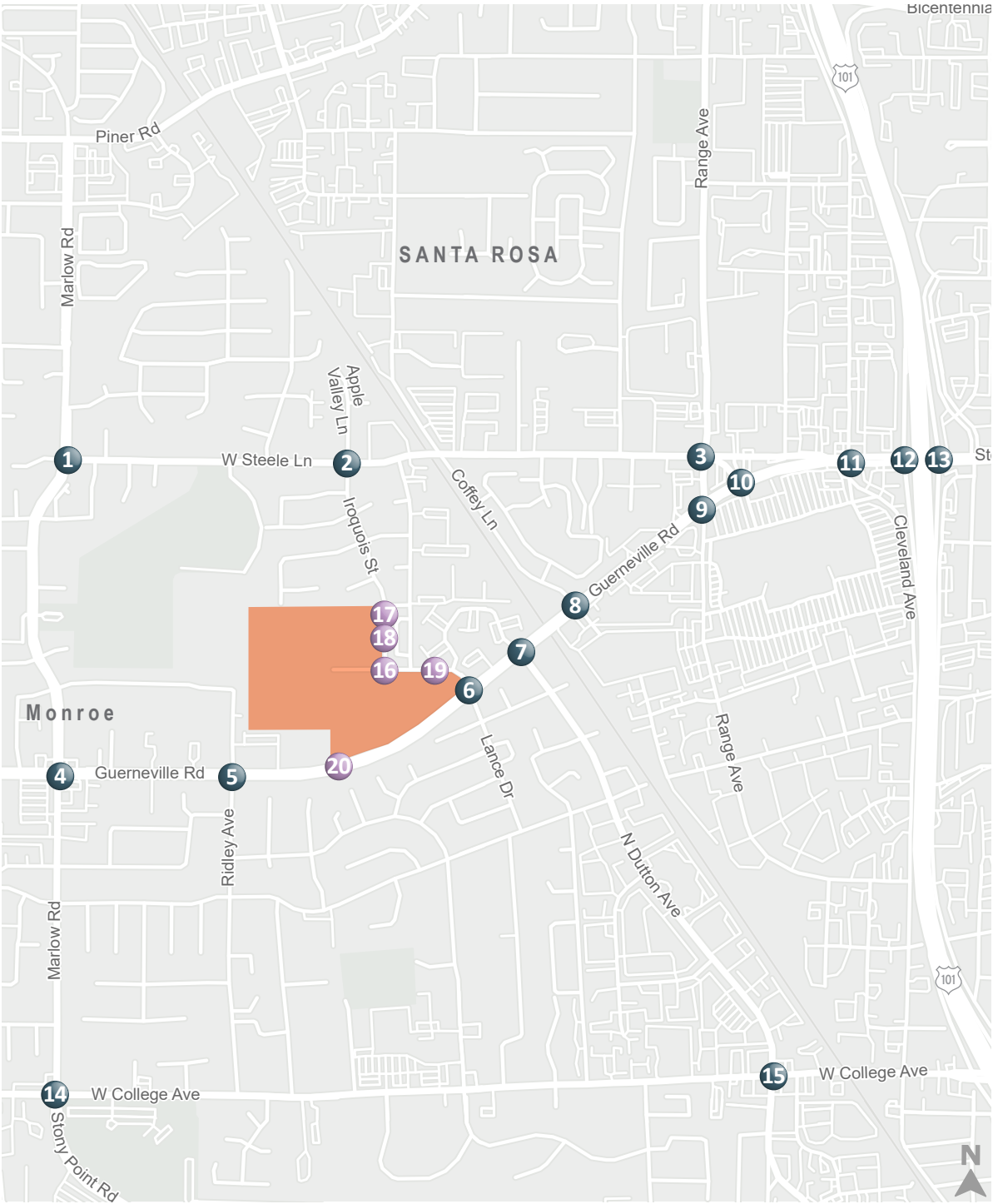
2.4 EXISTING INTERSECTION VOLUMES AND LANE CONFIGURATIONS

The operations of the study intersections are evaluated for the highest one-hour volume during the weekday morning (7:00 to 9:00 AM) and weekday afternoon (4:00 to 6:00 PM) periods. Existing peak period intersection counts for fourteen intersections were conducted at the study intersections in April 2022 on a clear day with area schools in-session and most COVID-19 pandemic restrictions lifted. This count approach is consistent with Caltrans guidance for collecting post-COVID traffic data. Two intersections use data collection from the City's database, collected in November 2021. The highest 60-minute volume at each individual intersection was used in the analysis, with intersection volumes balanced based on the higher volume (where appropriate). These counts formed the basis of the Existing Conditions intersection operations analysis (discussed further in **Section 2.5**). A summary of count data is included in **Appendix A**.

Existing lane configurations and types of intersection control devices were confirmed through field observations. For the purposes of this analysis, the Project site is assumed to be vacant under existing



conditions. **Figure 3** presents the existing weekday morning (AM) and evening (PM) peak hour turning movement volumes, lane configurations, and traffic control devices used in the Existing Conditions analysis.



1. Marlow Rd/Marlow Ct/W Steele Ln 	2. Apple Valley Ln/Iroquois St/W Steele Ln 	3. Range Ave/W Steele Ln 	4. Marlow Rd/Guerneville Rd 	5. Ridley Ave/Guerneville Rd
6. Lance Dr/Guerneville Rd 	7. Westberry Dr/N Dutton Ave/Guerneville Rd 	8. Coffey Ln/Herbert St/Guerneville Rd 	9. Range Ave/Guerneville Rd 	10. Steele Wy/Guerneville Rd
11. Cleveland Ave/Guerneville Rd 	12. US 101 SB Ramps/Guerneville Rd 	13. US 101 NB Ramps/Guerneville Rd/Steele Ln 	14. Marlow Rd/Stony Point Rd/W College Ave 	15. N Dutton Ave/W College Ave
16. Iroquois St/Lance Dr 	17. Iroquois St/Project Driveway (1) 	18. Iroquois St/Project Driveway (2) 	19. Project Driveway (3)/Lance Dr 	20. Project Driveway (4)/Guerneville Rd

XX (YY) AM (PM) Peak Hour Traffic Volumes
Signalized Intersection
Stop Sign
Project Site
Study Intersection
Project Driveway Study Intersection



Figure 3

Existing Conditions Peak Hour Intersection Traffic Volumes, Lane Configurations, and Traffic Controls

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2.5 EXISTING INTERSECTION LEVELS OF SERVICE

Existing intersection lane configurations and peak hour turning movement volumes were used to calculate the levels of service (LOS) for the study intersections during the weekday AM and PM peak hours for Existing Conditions. The results of the LOS analysis using the Synchro software program for the study intersections under Existing Conditions are presented in **Table 5**, and the corresponding LOS calculation sheets are included in **Appendix B**.

The results of the LOS calculations indicate that all study intersections operate acceptably with respect to their LOS standard. The following intersections do not meet their respective LOS standard:

- Intersection 4: Guerneville Road/Marlow Road (LOS E in the PM peak hour)
- Intersection 11: Guerneville Road/Cleveland Avenue (LOS E in the AM peak hour)

TABLE 5: EXISTING CONDITIONS INTERSECTION LEVELS OF SERVICE

	Intersection	Control Type ¹	Peak Hour ²	Delay ³	LOS ⁴	LOS Standard
1	Marlow Road/West Steele Lane	Signalized	AM PM	33.3-39.4 37.8-48.9	C-D D	D
2	Iroquois Street-Apple Valley Lane/West Steele Lane	SSSC	AM PM	3.4 (25.3) 3.0 (22.2)	A (D) A (C)	D
3	Range Avenue/West Steele Lane	Signalized	AM PM	16.9-23.4 23.3-33.3	B-C C	D
4	Guerneville Road/Marlow Road	Signalized	AM PM	41.5-54.4 52.7-57.1	D D-E	D
5	Guerneville Road/Ridley Avenue	Signalized	AM PM	3.2-7.9 1.0-1.4	A A	D
6	Guerneville Road/Lance Drive	Signalized	AM PM	43.7-49.6 39.0-51.8	D D	D
7	Guerneville Road/North Dutton Avenue	Signalized	AM PM	36.8-43.0 28.0-31.7	D C	D
8	Guerneville Road/Coffey Lane	Signalized	AM PM	33.6-54.8 44.8-50.1	C-D D	D
9	Guerneville Road/Range Avenue	Signalized	AM PM	42.8-52.9 39.4-52.6	D D	D
10	Guerneville Road/Steele Way	Signalized	AM PM	32.9-39.9 39.5-50.4	C-D D	D



TABLE 5: EXISTING CONDITIONS INTERSECTION LEVELS OF SERVICE

	Intersection	Control Type ¹	Peak Hour ²	Delay ³	LOS ⁴	LOS Standard
11	Guerneville Road/Cleveland Avenue	Signalized	AM PM	42.7-56.0 41.9-54.7	D-E D	D
12	Guerneville Road/US 101 Southbound Ramps	Signalized	AM PM	28.1-41.9 30.7-43.6	C-D C-D	D
13	Guerneville Road/US 101 Northbound Ramps	Signalized	AM PM	22.6-32.87 26.2-36.8	C C-D	D
14	Marlow Road-Stony Point Road/West College Avenue	Signalized	AM PM	37.3-54.2 46.6-54.9	D D	D
15	North Dutton Avenue/West College Avenue	Signalized	AM PM	39.6-54.9 44.4-54.9	D D	D
16	Lance Drive/Iroquois Street	AWSC	AM PM	7.6 7.2	A A	D

Notes:

1. Signalized = Traffic Signal Control, SSSC = Side-Street Stop-Controlled, AWSC = All-Way Stop-Controlled

2. AM = Weekday morning peak hour, PM = Weekday evening peak hour

3. Whole intersection average delay reported for signalized intersections and all-way stop-controlled intersections. Side-street stop-controlled delay presented as Whole Intersection Average Delay (Worst Movement Delay). Delay calculated per *HCM 6th Edition* methodologies.

4. LOS designation per *HCM 6th Edition*.

Bold indicates unacceptable operations.

Source: Fehr & Peers, June 2024.



3.0 PROJECT TRIP GENERATION ESTIMATES

This chapter provides an overview of the proposed Project's trip generation, distribution, and assignment characteristics, allowing for an evaluation of Project effects on the surrounding roadway network. The amount of traffic associated with the Project was estimated using a three-step process:

1. **Trip Generation** – The estimated *amount* of vehicle traffic entering/exiting the Project site.
2. **Trip Distribution** – The *direction* trips are projected to approach and depart the Project site.
3. **Trip Assignment** – The Project trips were then *assigned* to specific roadway segments and intersection turning movements based on likely paths of travel.

3.1 PROJECT TRIP GENERATION

The Project's trip generation was estimated using the MXD+ methodology for the weekday daily, weekday AM peak hour, and weekday PM peak hour. This methodology is more precise than conventional methods for estimating the number of trips generated by mixed-use projects, such as use of the Institute of Traffic Engineers (ITE) *Trip Generation Manual 11th Edition*, which is based on data derived primarily from single-use and freestanding sites. The MXD+ trip generation methodology, based on Environmental Protection Agency (EPA) and National Cooperative Highway Research Program (NCHRP) research, more precisely estimates trip generation of mixed-use projects by accounting for the travel within the Project (i.e., between uses), trips made by non-automobile modes, and the Project's land use context.¹ This approach has been successfully applied and defended throughout Northern California to more precisely estimate external trip generation for mixed-use projects. While this approach accounts for a variety of factors noted above, it does not account for transportation demand management (TDM) measures, such as a constrained parking supply, subsidized transit passes, or other incentives to travel by non-auto modes. **Table 6** presents the estimates of the trip generation for the proposed Project.

¹ For more information on the MXD+ methodology please visit <https://www.fehrandpeers.com/mainstreet/> or see *Getting Trip Generation Right Eliminating the Bias Against Mixed Use Development* by the American Planning Association, May 2013.



TABLE 6: PROJECT TRIP GENERATION

Land Use	Quantity ¹	Daily	AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
Single-Family Homes ²	100 du	1,009	19	55	74	62	37	99
Apartments ³	672 du	4,383	55	176	231	195	115	310
Retail ⁴	5.0 ksf	441	11	7	18	24	24	48
Subtotal before Reductions		5,833	85	238	323	281	176	457
MXD+ Internal Capture Reduction		104	3	7	10	7	5	12
MXD+ External Walk, Bike, and Transit		368	5	14	19	17	10	27
Net New Project Trips		5,361	77	217	294	257	161	418

Notes:

- 1 du = 1 dwelling unit; 1 ksf = 1,000 square feet gross leasable area
2. Single-family home trip generation based on ITE *Trip Generation Manual*, 11th Edition Land Use Code 210 (Single-Family Detached Housing)
3. Apartment trip generation based on ITE *Trip Generation Manual*, 11th Edition Land Use Code 220 (Low-Rise Multifamily Housing)
4. Retail trip generation based on ITE *Trip Generation Manual*, 11th Edition Land Use Code 822 (Strip Retail Plaza/Retail <40 ksf)

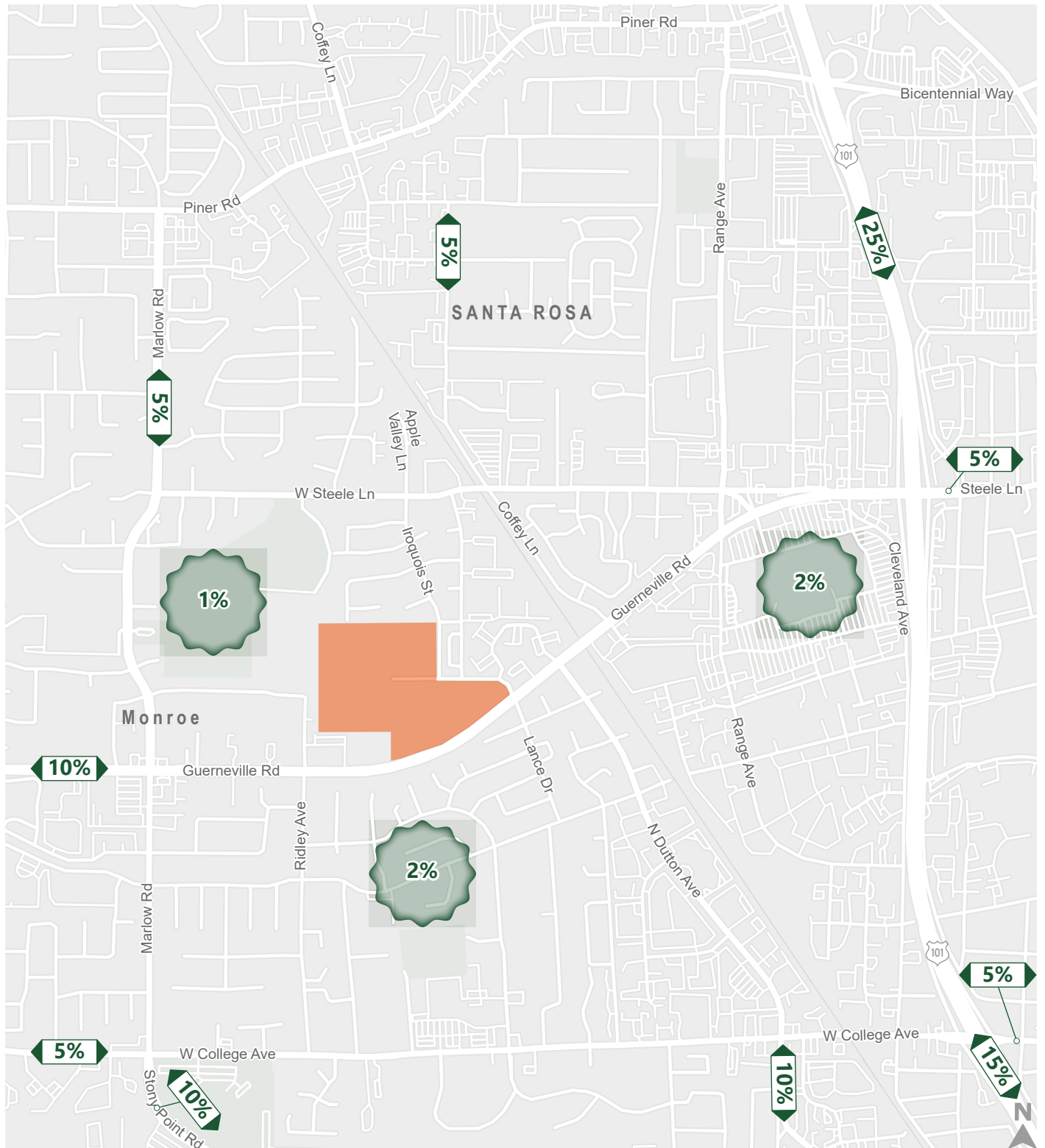
Source: Fehr & Peers, June 2024.

As summarized in **Table 6**, the proposed development would generate approximately 5,361 weekday daily, 294 weekday AM peak hour, and 418 weekday PM peak hour trips. The effect of these trips on the operations of the circulation system are discussed (for informational, non-CEQA purposes) in **Section 4.1.1** (for Existing Conditions Policy Violations), **Section 5.1.6** (for Near Term Conditions Policy Violations), and **Section 6.1.5** (for Cumulative Conditions Policy Violations).

3.2 PROJECT TRIP DISTRIBUTION AND ASSIGNMENT

The trip distribution and assignment process are used to estimate how the trips generated by a Project would be distributed across the roadway network. The geographical distribution of trips generated by the Project is based on the locations of complementary land uses, the street system serving the Project, and existing travel patterns in the area; data from the Sonoma County Transportation Authority travel demand model was also used to provide input into the trip distribution process. **Figure 4** presents the resulting trip distribution.

While Project trip distribution provides information regarding larger-scale trip patterns, Project trip assignment refers to project trip loading on specific roadway segments and intersection turning movements in the study area. The project trip assignment for the Project is presented on **Figure 5**.



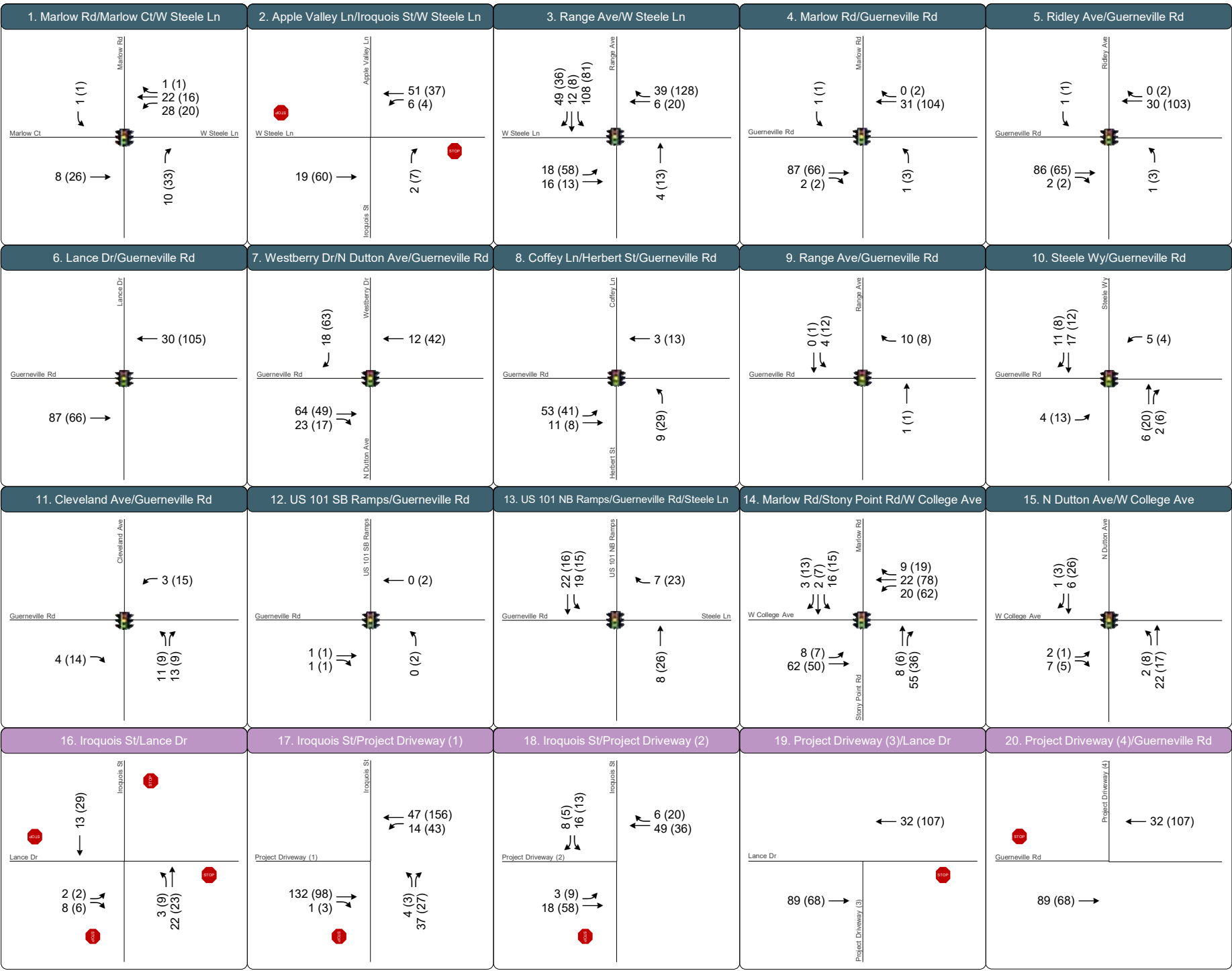
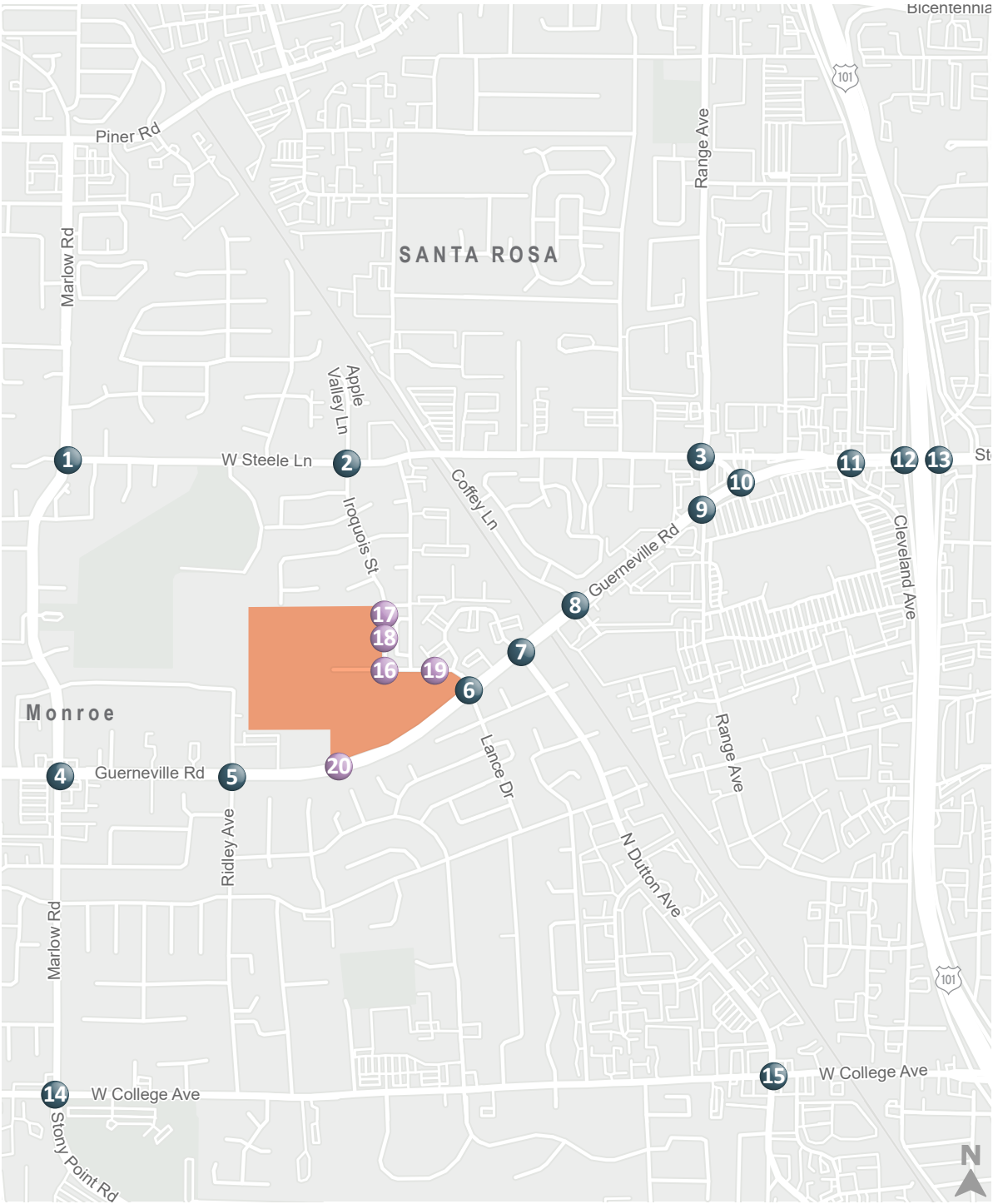
 Project Site
  Project Trip Distribution



Figure 4

Project Trip Distribution

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XX (YY) AM (PM) Peak Hour Traffic Volumes Signalized Intersection Stop Sign

Project Site Study Intersection Project Driveway Study Intersection



Figure 5

Project Trip Assignment

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4.0 EXISTING WITH PROJECT CONDITIONS

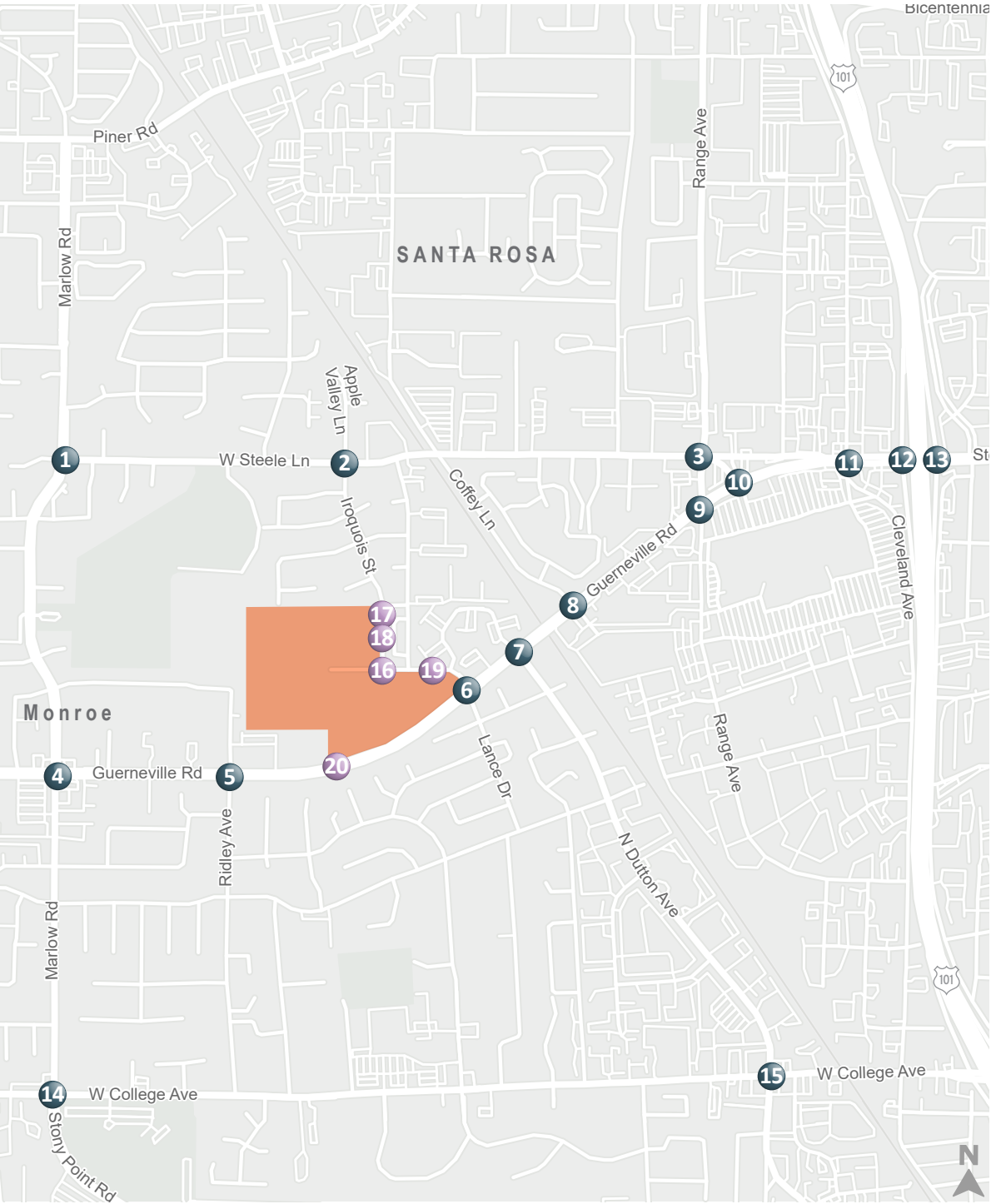
This chapter includes an informational (non-CEQA) evaluation of intersection operations under Existing with Project Conditions.

4.1 INTERSECTION LEVEL OF SERVICE ANALYSIS

Existing with Project Conditions peak hour intersection turning movement volumes are presented on **Figure 6**. These volumes were derived by adding the Project trip assignment (presented on **Figure 5**) to the Existing Conditions volumes (presented on **Figure 3**).

Table 7 presents the Existing with Project Conditions intersection LOS results. Detailed intersection LOS calculation worksheets are provided in **Appendix A**. Existing traffic signal timings, peak hour factors, heavy vehicle percentages, and pedestrian and bicycle activity at the study intersections were assumed to remain the same as current conditions in the Existing with Project Conditions scenario.

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1. Marlow Rd/Marlow Ct/W Steele Ln 	2. Apple Valley Ln/Iroquois St/W Steele Ln 	3. Range Ave/W Steele Ln 	4. Marlow Rd/Guerneville Rd 	5. Ridley Ave/Guerneville Rd
6. Lance Dr/Guerneville Rd 	7. Westberry Dr/N Dutton Ave/Guerneville Rd 	8. Coffey Ln/Herbert St/Guerneville Rd 	9. Range Ave/Guerneville Rd 	10. Steele Wy/Guerneville Rd
11. Cleveland Ave/Guerneville Rd 	12. US 101 SB Ramps/Guerneville Rd 	13. US 101 NB Ramps/Guerneville Rd/Steele Ln 	14. Marlow Rd/Stony Point Rd/W College Ave 	15. N Dutton Ave/W College Ave
16. Iroquois St/Lance Dr 	17. Iroquois St/Project Driveway (1) 	18. Iroquois St/Project Driveway (2) 	19. Project Driveway (3)/Lance Dr 	20. Project Driveway (4)/Guerneville Rd

XX (YY) AM (PM) Peak Hour Traffic Volumes Signalized Intersection Stop Sign

Project Site Study Intersection Project Driveway Study Intersection



Figure 6

Existing with Project Conditions Peak Hour Intersection Traffic Volumes, Lane Configurations, and Traffic Controls

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The results of the LOS calculations indicate that all of the study intersections are projected to continue operating acceptably with respect to their LOS standard.

TABLE 7: EXISTING WITH PROJECT CONDITIONS INTERSECTION LEVELS OF SERVICE

	Intersection	Control Type ¹	Peak Hour ²	Existing Conditions		Existing with Project Conditions	
				Delay ³	LOS ⁴	Delay ³	LOS ⁴
1	Marlow Road/West Steele Lane	Signalized	AM PM	33.3-39.4 37.8-48.9	C-D D	33.1-39.2 37.5-52.4	C-D D
2	Iroquois Street-Apple Valley Lane/West Steele Lane	SSSC	AM PM	3.4 (25.3) 3.0 (22.2)	A (D) A (C)	4.2 (27.7) 3.6 (24.7)	A (D) A (C)
3	Range Avenue/West Steele Lane	Signalized	AM PM	16.9-23.4 23.3-33.3	B-C C	16.9-23.4 23.3-33.4	B-C C
4	Guerneville Road/Marlow Road	Signalized	AM PM	41.5-54.4 52.7-57.1	D D-E	45.1-54.4 54.0-56.5	D D-E
5	Guerneville Road/Ridley Avenue	Signalized	AM PM	3.2-7.9 1.0-1.4	A A	3.1-6.0 1.2-1.7	A A
6	Guerneville Road/Lance Drive	Signalized	AM PM	43.7-49.6 39.0-51.8	D D	43.3-54.0 38.7-61.1	D D-E
7	Guerneville Road/North Dutton Avenue	Signalized	AM PM	36.8-43.0 28.0-31.7	D C	38.7-50.3 29.0-34.0	D C
8	Guerneville Road/Coffey Lane	Signalized	AM PM	33.6-54.8 44.8-50.1	C-D D	36.8-70.8 44.0-49.8	D-E D
9	Guerneville Road/Range Avenue	Signalized	AM PM	42.8-52.9 39.4-52.6	D D	42.9-53.1 40.2-52.0	D D
10	Guerneville Road/Steele Way	Signalized	AM PM	32.9-39.9 39.5-50.4	C-D D	33.0-39.1 41.6-51.8	C-D D
11	Guerneville Road/Cleveland Avenue	Signalized	AM PM	42.7-56.0 41.9-54.7	D-E D	43.6-56.3 48.8-53.7	D-E D
12	Guerneville Road/US 101 Southbound Ramps	Signalized	AM PM	28.1-41.9 30.7-43.6	C-D C-D	27.9-41.5 30.4-43.1	C-D C-D
13	Guerneville Road/US 101 Northbound Ramps	Signalized	AM PM	22.6-32.87 26.2-36.8	C C-D	22.3-32.2 26.4-32.3	C C
14	Marlow Road-Stony Point Road/West College Avenue	Signalized	AM PM	37.3-54.2 46.6-54.9	D D	37.3-54.2 46.6-54.9	D D
15	North Dutton Avenue/West College Avenue	Signalized	AM PM	39.6-54.9 44.4-54.9	D D	39.7-54.9 45.0-54.7	D D



TABLE 7: EXISTING WITH PROJECT CONDITIONS INTERSECTION LEVELS OF SERVICE

	Intersection	Control Type ¹	Peak Hour ²	Existing Conditions		Existing with Project Conditions	
				Delay ³	LOS ⁴	Delay ³	LOS ⁴
16	Lance Drive/Iroquois Street	AWSC	AM PM	7.6 7.2	A A	8.4 8.7	A A
17	Iroquois Street/Project Driveway (1)	SSSC	AM PM	<i>Intersection does not exist in this scenario.</i>		0.6 (8.9) 0.6 (8.9)	A (A) A (A)
18	Iroquois Street/Project Driveway (2)	SSSC	AM PM	<i>Intersection does not exist in this scenario.</i>		0.6 (8.9) 0.7 (9.0)	A (A) A (A)
19	Lance Drive/Project Driveway (3)	SSSC	AM PM	<i>Intersection does not exist in this scenario.</i>		1.4 (9.8) 1.3 (9.6)	A (A) A (A)
20	Guerneville Road/Project Driveway (4)	SSSC	AM PM	<i>Intersection does not exist in this scenario.</i>		0.3 (18.2) 0.4 (29.9)	A (C) A (D)

Notes:

1. Signalized = Traffic Signal Control, SSSC = Side-Street Stop-Controlled, AWSC = All-Way Stop-Controlled

2. AM = Weekday morning peak hour, PM = Weekday evening peak hour

3. Whole intersection average delay reported for signalized intersections and all-way stop-controlled intersections. Side-street stop-controlled delay presented as Whole Intersection Average Delay (Worst Movement Delay). Delay calculated per *HCM 6th Edition* methodologies.

4. LOS designation per *HCM 6th Edition*.

Bold indicates unacceptable operations.

Source: Fehr & Peers, June 2024.

4.1.1 EXISTING WITH PROJECT CONDITIONS POLICY VIOLATIONS

This section of the report evaluates the Existing with Project Conditions intersection LOS results presented in **Table 7**. The study intersections would continue to function within the City's adopted standards related to levels of service under Existing and Existing with Project conditions.

Intersection 4: Guerneville Road/Marlow Road – This intersection is projected to operate at a deficient LOS E during the PM peak hour under Existing with Project Conditions. However, the adaptive signals allow for the signal to dynamically change within the peak hour and thus operate within the City's adopted standards.

Intersection 6: Guerneville Road/Lance Drive – This intersection is projected to operate at a deficient LOS E during PM peak hour under Existing with Project Conditions. The adaptive signals allow for the signal to dynamically change within the peak hour and thus operate within the City's adopted standards.

Intersection 8: Guerneville Road/Coffey Lane – This intersection is projected to operate at a deficient LOS E during the AM peak hour under Existing with Project Conditions. The adaptive signals allow for the signal to dynamically change within the peak hour and thus operate within the City's adopted standards.



Intersection 11: Guerneville Road/Cleveland Avenue – This intersection is projected to operate at a deficient LOS E during the PM peak hour under Existing with Project Conditions. The addition of Project traffic would not increase average peak hour delay at the intersection by more than 5.0 seconds and would not increase the volume-to-capacity ratio by more than 0.02 in the PM peak hour. Therefore, the Project would not result in a violation of the City's adopted standards.



5.0 NEAR-TERM CONDITIONS

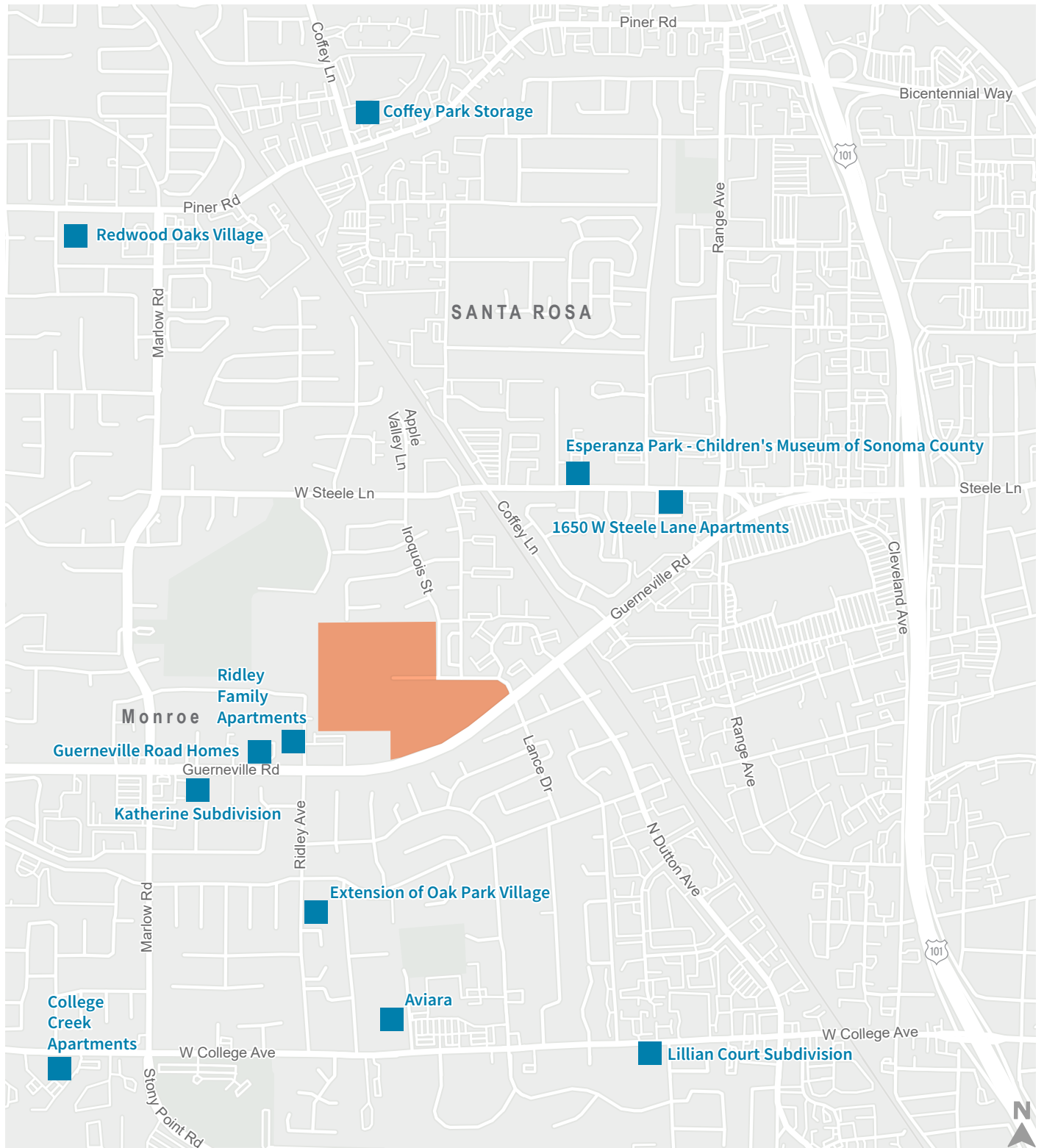
This chapter discusses Near-Term traffic conditions both without and with the Project. The near-term conditions analysis considers approved projects within the study area that are expected to be constructed and occupied in the next five to ten years. No background roadway improvements were assumed at any of the study intersections for the analysis of near-term conditions.

5.1 NEAR-TERM CIRCULATION ANALYSIS

This subsection identifies the Near-Term LOS results with the addition of peak hour trips expected to be generated by near term development projects. This section summarizes intersection LOS for information/non-CEQA analysis to ensure consistency with the goals of the City of Santa Rosa's General Plan 2035 and the City's *Guidance for the Preparation of Traffic Operational Analysis*.

5.1.1 NEAR-TERM CONDITIONS TRAFFIC VOLUMES

The Near-Term scenario reflects existing traffic counts plus traffic from approved and pending developments within the Project vicinity. Therefore, the near-term condition represents the likely traffic levels at the time of Project completion. The latest project list from the City of Santa Rosa's Pending Developments Map and List (accessed August 2023) was used to determine which approved and pending developments should be incorporated. Based on a review of the list, several developments were identified that would generate additional traffic through the study area. These proposed developments are listed in **Table 8** and their locations are presented on **Figure 7**.



Project Site
 Near-Term Approved Project



Figure 7

Near-Term Approved Project Locations



TABLE 8: NEAR-TERM APPROVED AND PENDING PROJECTS

Project Name	Size ¹	Land Use
Coffey Park Storage	69.832 ksf	Mini-Warehouse
Aviara	136 du	Multifamily Housing (Low-Rise)
College Creek Apartments	164 du	Multifamily Housing (Low-Rise)
Lillian Court Subdivision	10 du	Single-Family Detached Housing
Guerneville Road Homes	15 du	Multifamily Housing (Low-Rise)
Katherine Subdivision	15 du	Single-Family Detached Housing
Redwood Oaks Village	72 du 6.312 ksf	Multifamily Housing (Low-Rise) Strip Retail Plaza (<40k)
Extension of Oak Park Village	7 du	Single-Family Detached Housing
Ridley Family Apartments	50 du	Multifamily Housing (Low-Rise)
1650 W Steele Lane Apartments	36 du	Multifamily Housing (Low-Rise)
Esperanza Park – Children’s Museum of Sonoma County	37.071 ksf	Museum

Notes:

1. 1 du = 1 dwelling unit; 1 ksf = 1,000 square feet gross leasable area

Source: City of Santa Rosa Pending Developments, accessed August 2023.

Near-Term project vehicle trip generation, provided in **Table 9**, was estimated using trip generation rates and equations for the proposed land uses from ITE’s *Trip Generation Manual* (11th Edition). However, the Redwood Oaks Village project is also a mixed-use development; therefore, the MXD+ methodology was used to estimate its trip generation. The near-term trip generation estimates for Redwood Oaks Village is available in the *2000 Piner Road Transportation Impact Analysis Report* (April 2022). Traffic generated by approved developments was added to the existing traffic volumes to provide the basis for the Near-Term analysis, as presented on **Figure 8**.



TABLE 9: NEAR-TERM APPROVED AND PENDING PROJECTS TRIP GENERATION

Project Name	Land Use	Quantity ¹	Daily	AM Peak Hour			PM Peak Hour		
				In	Out	Total	In	Out	Total
Coffey Park Storage	Storage ²	69.832 ksf	101	4	2	6	5	5	10
Aviara	Apartments ³	136 du	917	16	49	65	50	29	79
College Creek Apartments	Apartments	164 du	1,105	18	56	74	57	34	91
Lillian Court Subdivision	Single-Family ⁴	10 du	94	2	7	9	7	4	11
Guerneville Road Homes	Apartments	15 du	101	7	21	28	17	10	27
Katherine Subdivision	Single-Family	15 du	141	3	10	13	11	6	17
Redwood Oaks Village ⁵	Apartments Retail	72 du 6,312 ksf	829	16	28	44	41	32	73
Extension of Oak Park Village	Single-Family	7 du	66	2	5	7	5	3	8
Ridely Family Apartments	Apartments	50 du	337	9	29	38	26	16	42
1650 W Steele Lane Apartments	Apartments	36 du	243	8	26	34	23	13	36
Esperanza Park – Children’s Museum of Sonoma County	Museum ⁶	37.071 ksf	-	9	1	10	1	6	7
Net New Project Trips			4,106	86	230	316	239	166	405

Notes:

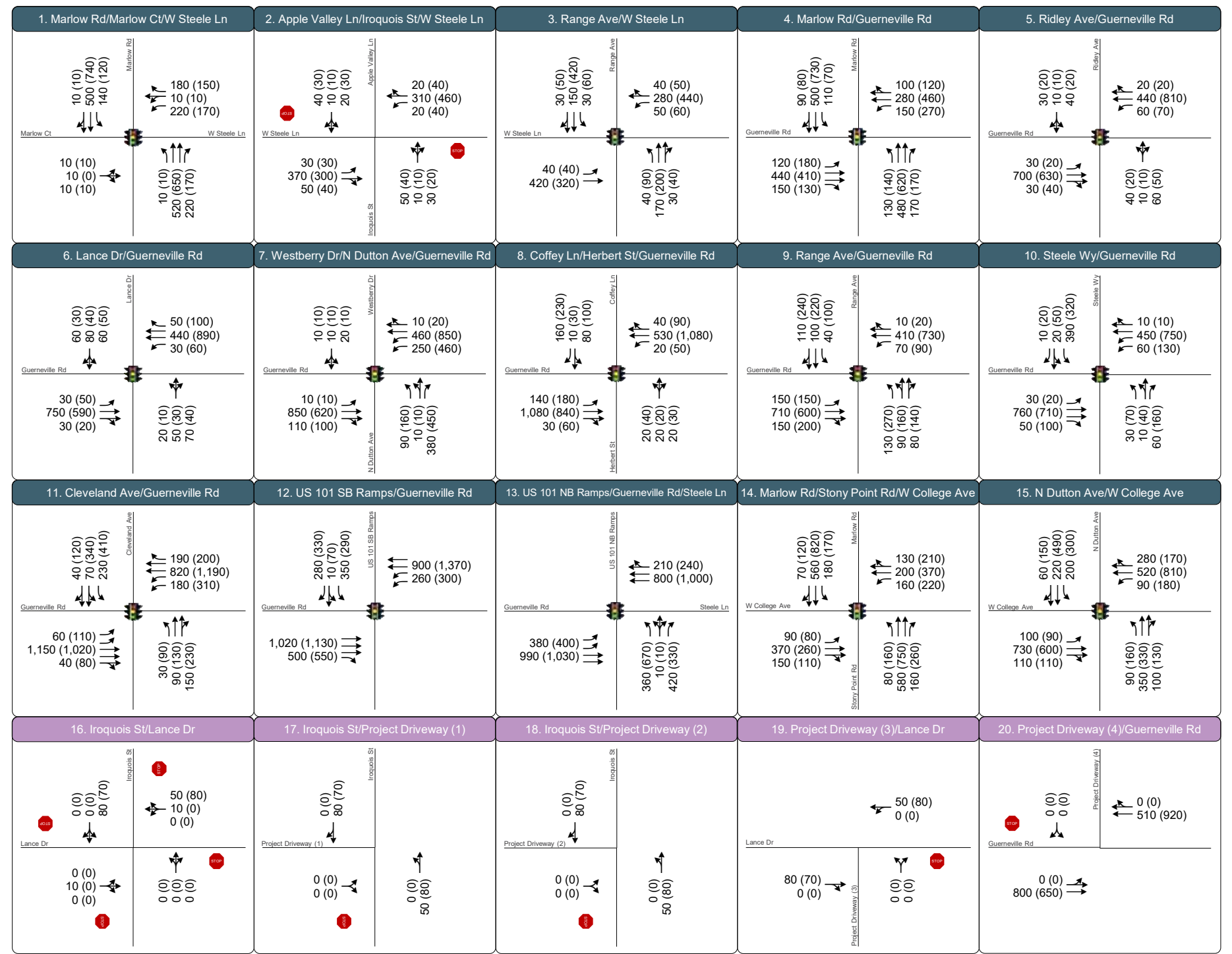
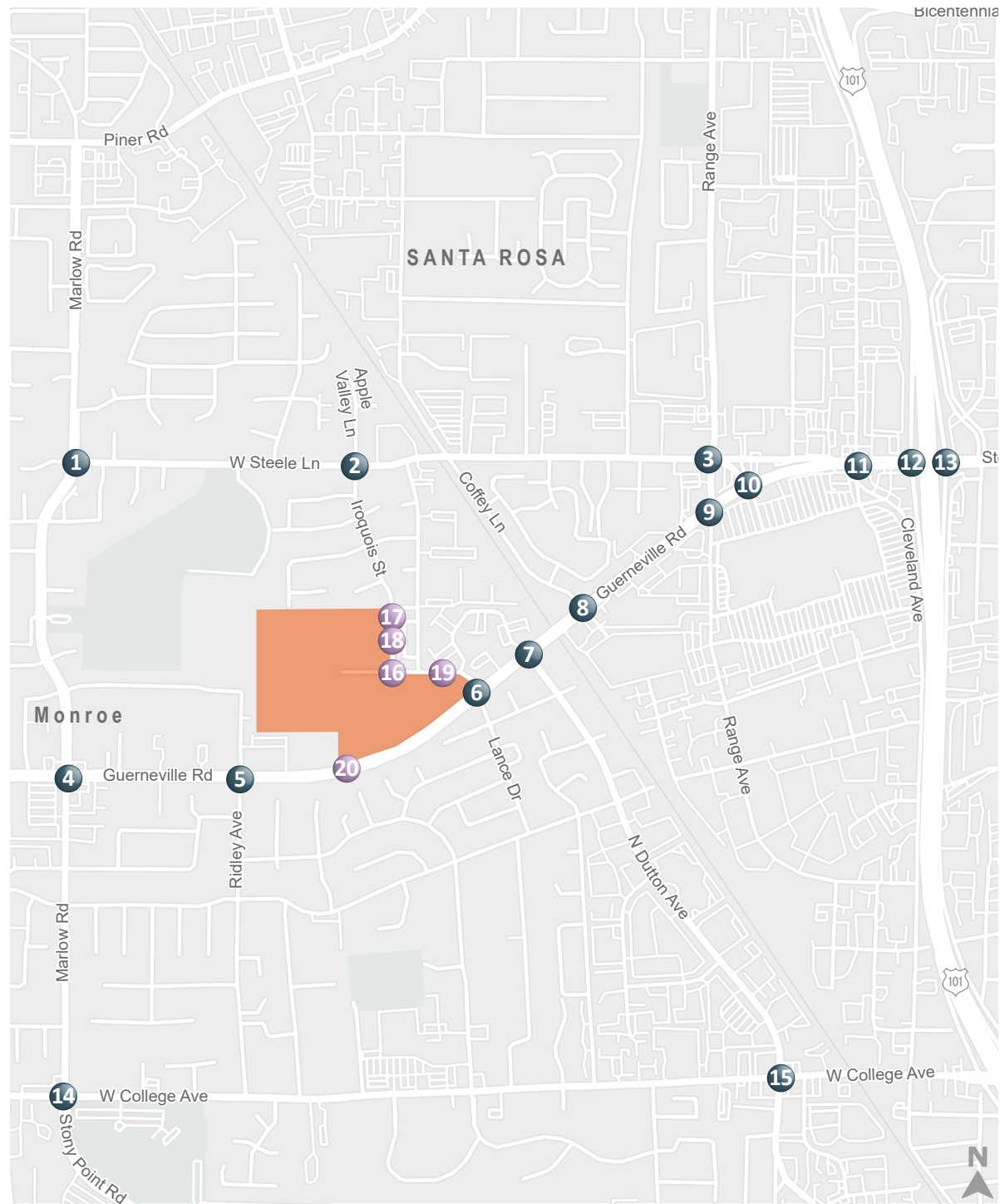
- 1 du = 1 dwelling unit; 1 ksf = 1,000 square feet gross leasable area
- Storage trip generation based on ITE *Trip Generation Manual*, 11th Edition Land Use Code 151 (Mini-Warehouse)
- Apartment trip generation based on ITE *Trip Generation Manual*, 11th Edition Land Use Code 220 (Low-Rise Multifamily Housing)
- Single-Family trip generation based on ITE *Trip Generation Manual*, 11th Edition Land Use Code 210 (Single-Family Detached Housing) or Land Use Code 215 (Single-Family Attached Housing)
- Project trip generation based on 2000 *Piner Road Transportation Impact Analysis Report* (April 2022), Fehr & Peers
- Museum trip generation based on ITE *Trip Generation Manual*, 11th Edition Land Use Code 580 (Museum)

Source: Fehr & Peers, June 2024.

5.1.2 NEAR-TERM WITH PROJECT TRAFFIC VOLUMES

Project generated traffic was added to the Near-Term without Project volumes to estimate Near-Term with Project volumes. The resulting volumes are presented on **Figure 9**.

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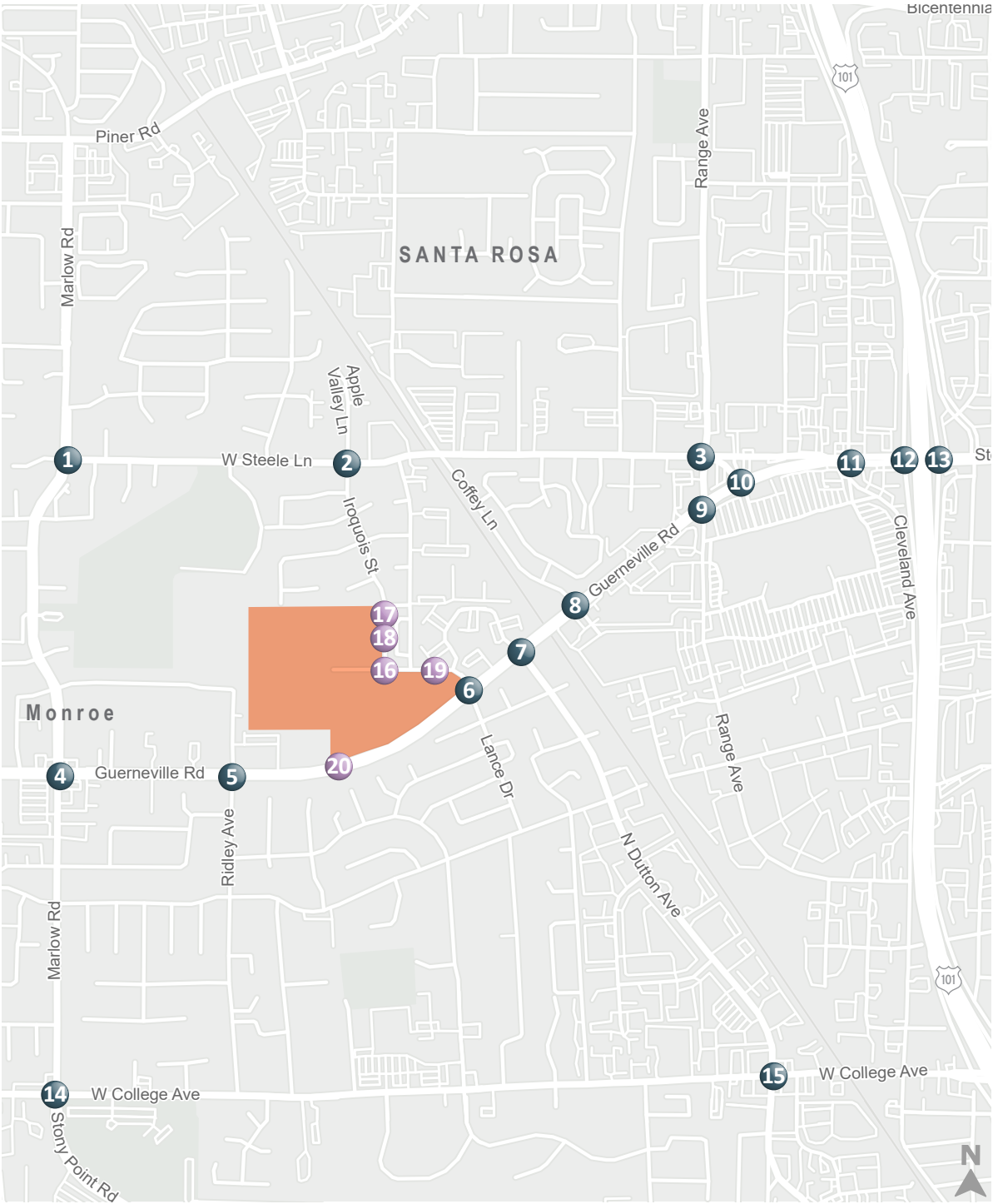


XX (YY) AM (PM) Peak Hour Traffic Volumes

Signalized Intersection Stop Sign

Project Site Study Intersection Project Driveway Study Intersection





1. Marlow Rd/Marlow Ct/W Steele Ln 	2. Apple Valley Ln/Iroquois St/W Steele Ln 	3. Range Ave/W Steele Ln 	4. Marlow Rd/Guerneville Rd 	5. Ridley Ave/Guerneville Rd
6. Lance Dr/Guerneville Rd 	7. Westberry Dr/N Dutton Ave/Guerneville Rd 	8. Coffey Ln/Herbert St/Guerneville Rd 	9. Range Ave/Guerneville Rd 	10. Steele Wy/Guerneville Rd
11. Cleveland Ave/Guerneville Rd 	12. US 101 SB Ramps/Guerneville Rd 	13. US 101 NB Ramps/Guerneville Rd/Steele Ln 	14. Marlow Rd/Stony Point Rd/W College Ave 	15. N Dutton Ave/W College Ave
16. Iroquois St/Lance Dr 	17. Iroquois St/Project Driveway (1) 	18. Iroquois St/Project Driveway (2) 	19. Project Driveway (3)/Lance Dr 	20. Project Driveway (4)/Guerneville Rd

XX (YY) AM (PM) Peak Hour Traffic Volumes Signalized Intersection Stop Sign

Project Site Study Intersection Project Driveway Study Intersection



Figure 9

Near-Term with Project Conditions Peak Hour Intersection Traffic Volumes, Lane Configurations, and Traffic Controls



5.1.3 NEAR-TERM WITH PROJECT INTERSECTION LEVELS OF SERVICE

Intersection LOS was calculated for Near-Term without Project Conditions and Near-Term with Project Conditions. The results of the analyses are used to identify potential deficiencies on the operations of the roadway system. Traffic signal timings at the study intersections were optimized in the Near-Term and Near-Term with Project Conditions to account for ongoing infrastructure maintenance conducted by the City.

Table 10 provides the results of the intersection LOS calculations, while **Appendix B** contains the corresponding calculation sheets. The addition of Project generated traffic to Near Term Baseline Conditions was not found to violate any of the City's established LOS policies.

TABLE 10: NEAR-TERM CONDITIONS INTERSECTION LEVEL OF SERVICE

	Intersection	Control Type ¹	Peak Hour ²	Near-Term without Project Conditions		Near-Term with Project Conditions	
				Delay ³	LOS ⁴	Delay ³	LOS ⁴
1	Marlow Road/West Steele Lane ⁵	Signalized	AM PM	34.5-40.8 38.1-45.3	C-D D	34.4-40.7 37.8-55.7	C-D D-E
2	Iroquois Street-Apple Valley Lane/West Steele Lane	SSSC	AM PM	5.2 (34.1) 3.9 (26.9)	A (D) A (D)	6.6 (40.8) 4.8 (31.0)	A (E) A (D)
3	Range Avenue/West Steele Lane	Signalized	AM PM	17.1-23.6 23.4-33.9	B-C C	17.1-23.6 23.4-33.9	B-C C
4	Guerneville Road/Marlow Road	Signalized	AM PM	43.9-55.0 53.7-58.5	D D-E	48.2-55.0 54.2-57.6	D D-E
5	Guerneville Road/Ridley Avenue ⁵	Signalized	AM PM	4.8-10.1 2.3-3.2	A-B A	4.7-8.1 2.4-3.3	A A
6	Guerneville Road/Lance Drive ⁵	Signalized	AM PM	44.2-49.6 38.0-50.2	D D	43.7-54.4 37.6-60.0	D D-E
7	Guerneville Road/North Dutton Avenue	Signalized	AM PM	38.3-42.6 28.3-31.7	D C	39.4-58.5 29.5-36.7	D-E C-D
8	Guerneville Road/Coffey Lane	Signalized	AM PM	33.2-61.8 45.9-54.7	C-E D	38.7-79.0 45.3-54.3	D-E D
9	Guerneville Road/Range Avenue ⁵	Signalized	AM PM	43.0-53.2 39.9-53.5	D D	43.1-53.1 40.6-53.0	D D
10	Guerneville Road/Steele Way ⁵	Signalized	AM PM	33.4-39.9 40.3-51.1	C-D D	33.6-39.3 41.7-52.3	C-D C
11	Guerneville Road/Cleveland Avenue ⁵	Signalized	AM PM	43.4-56.3 45.6-54.4	D-E D	44.5-56.5 49.7-55.7	D-E D-E



TABLE 10: NEAR-TERM CONDITIONS INTERSECTION LEVEL OF SERVICE

Intersection	Control Type ¹	Peak Hour ²	Near-Term without Project Conditions		Near-Term with Project Conditions	
			Delay ³	LOS ⁴	Delay ³	LOS ⁴
12 Guerneville Road/US 101 Southbound Ramps ⁵	Signalized	AM PM	27.8-41.5 30.4-43.0	C-D C-D	27.5-41.0 30.1-42.5	C-D C-D
13 Guerneville Road/US 101 Northbound Ramps ⁵	Signalized	AM PM	22.9-33.1 26.7-37.1	C C-D	22.6-32.5 26.9-37.2	C C-D
14 Marlow Road-Stony Point Road/West College Avenue	Signalized	AM PM	38.8-54.9 47.9-55.0	D D	38.8-54.9 48.6-55.0	D D
15 North Dutton Avenue/West College Avenue	Signalized	AM PM	40.4-55.1 47.1-46.5	D-E D-E	40.5-55.1 47.3-59.6	D-E D-E
16 Lance Drive/Iroquois Street	AWSC	AM PM	7.7 7.3	A A	8.6 8.8	A A
17 Iroquois Street/Project Driveway (1)	SSSC	AM PM	<i>Intersection does not exist in this scenario.</i>		0.6 (8.9) 0.6 (9.0)	A (A) A (A)
18 Iroquois Street/Project Driveway (2)	SSSC	AM PM	<i>Intersection does not exist in this scenario.</i>		0.6 (9.0) 0.6 (9.1)	A (A) A (A)
19 Project Driveway (3)/Lance Drive	SSSC	AM PM	<i>Intersection does not exist in this scenario.</i>		1.4 (9.9) 1.3 (9.7)	A (A) A (A)
20 Guerneville Road/Project Driveway (4)	SSSC	AM PM	<i>Intersection does not exist in this scenario.</i>		0.3 (19.1) 0.4 (32.6)	A (C) A (D)

Notes

1. Signalized = Traffic Signal Control, SSSC = Side-Street Stop-Controlled, AWSC = All-Way Stop-Controlled
 2. AM = Weekday morning peak hour, PM = Weekday evening peak hour
 3. Whole intersection average delay reported for signalized intersections and all-way stop-controlled intersections. Side-street stop-controlled delay presented as Whole Intersection Average Delay (Worst Movement Delay). Delay calculated per *HCM 6th Edition* methodologies.
 4. LOS designation per *HCM 6th Edition*.
 5. The overall average delay at an intersection may slightly decrease with the addition of project trips. This may occur when trips are added to an approach with delay less than the average intersection delay, and the approach volume is under its capacity.
- Bold** indicates unacceptable operations.
Source: Fehr & Peers, June 2024.

5.1.4 NEAR-TERM WITH PROJECT SIGNAL WARRANT ANALYSIS

The peak-hour signal warrants (Warrant 3A and Warrant 3B) from the *Manual on Uniform Traffic Control Devices* (MUTCD) were used to evaluate unsignalized intersections that operate unacceptably under Near-Term with Project conditions to determine if a traffic signal is warranted (see **Appendix C**).

The analysis indicates that Intersection 2 (Iroquois Street-Apple Valley Lane/West Steele Lane) does not meet Warrant 3A or Warrant 3B in the AM peak hour. This analysis is intended to examine the general



correlation between the current level of development in the region and the need to install new traffic signals. It estimates traffic levels compared against a sub-set of the standard traffic signal warrants recommended in the Federal Highway Administration *Manual on Uniform Traffic Control Devices* and associated California MUTCD guidelines.

This analysis should not serve as the only basis for deciding whether and when to install a signal. To reach such a decision, the full set of warrants should be investigated by an experienced engineer based on field-analysis rather than forecast traffic data and a thorough study of traffic and roadway conditions. Furthermore, the decision to install a signal should not be based solely upon the warrants, since the installation of signals can lead to certain types of collisions. The appropriate agency should undertake regular monitoring of actual traffic conditions and collision data, and timely re-evaluation of the full set of warrants to prioritize and program intersections for signalization.

5.1.5 NEAR-TERM WITH PROJECT MULTI-WAY STOP APPLICATION

The multi-way stop control application from the *Manual on Uniform Traffic Control Devices* (MUTCD) was used to evaluate the unsignalized intersections that operate unacceptably under Near-Term with Project conditions to determine if an all-way stop control is warranted (see **Appendix C**).

The analysis indicated that Intersection 2 (Iroquois Street-Apple Valley Lane/West Steele Lane) does not meet the criteria for an all-way stop based on the crash history and vehicular, pedestrian, and bicycle volume entering the intersection from the minor street.

To reach a decision on implementing an all-way stop, all guidance from Section 2B.07 from the MUTCD should be investigated by an experienced engineer based on field-analysis rather than forecast traffic data and a thorough study of traffic and roadway conditions. Furthermore, the decision to install an all-way stop should not be based solely upon the application, since change in control can lead to certain types of collisions. The appropriate agency should undertake regular monitoring of actual traffic conditions and collision data, and timely re-evaluation to prioritize and program intersection controls.

5.1.6 NEAR-TERM WITH PROJECT CONDITIONS POLICY VIOLATIONS

This section of the report evaluates the Near-Term with Project Conditions intersection LOS results presented in **Table 10** against the City of Santa Rosa's level of service standards.

Intersection 1: Marlow Road/West Steele Lane – This intersection is projected to operate at a deficient LOS E during the PM peak hour under Near-Term with Project Conditions. The adaptive signals allow for the signal to dynamically change within the peak hour and thus operate within the City's adopted standards.



Intersection 2: Iroquois Street-Apple Valley Lane/West Steele Lane – This intersection’s worst movement is projected to operate at a deficient LOS E during the AM peak hour under Near-Term with Project Conditions. Although the intersection’s worst movement would degrade from an acceptable LOS D to LOS E during the AM peak hour, it does not meet the peak-hour signal warrants or all-way stop control application in the AM peak hour. Therefore, the intersection operates within the City’s adopted standards.

Intersection 4: Guerneville Road/Marlow Road – This intersection is projected to operate at a deficient LOS E during the PM peak hour under Near-Term with Project Conditions. The adaptive signals allow for the signal to dynamically change within the peak hour and thus operate within the City’s adopted standards.

Intersection 6: Guerneville Road/Lance Drive – This intersection is projected to operate at a deficient LOS E during the PM peak hour under Near-Term with Project Conditions. The adaptive signals allow for the signal to dynamically change within the peak hour and thus operate within the City’s adopted standards.

Intersection 7: Guerneville Road/North Dutton Avenue – The intersection is projected to operate at a deficient LOS E during the AM peak hour under Near-Term with Project Conditions. The adaptive signals allow for the signal to dynamically change within the peak hour and thus operate within the City’s adopted standards.

Intersection 8: Guerneville Road/Coffey Lane – The intersection is projected to operate at a deficient LOS E during the AM peak hour under Near-Term with Project Conditions. The adaptive signals allow for the signal to dynamically change within the peak hour and thus operate within the City’s adopted standards.

Intersection 11: Guerneville Road/Cleveland Avenue – The intersection is projected to operate at a deficient LOS E during the AM and PM peak hours under Near-Term with Project Conditions. The addition of Project traffic would not increase average peak hour delay at the intersection by more than 5.0 seconds and would not increase the volume-to-capacity ratio by more than 0.02 in the AM peak hour. The adaptive signals allow for the signal to dynamically change within the PM peak hour and thus operate within the City’s adopted standards.

Intersection 15: North Dutton Avenue/West College Avenue – This intersection is projected to operate at a deficient LOS E during the AM and PM peak hours under Near-Term with Project Conditions. The adaptive signals allow for the signal to dynamically change within the AM and PM peak hours and thus operate within the City’s adopted standards.

The results of the intersection operations analysis indicate that other study intersections would continue to operate at LOS D or better after the addition of Project trips. Based on the criteria presented in **Section 1.3.4**, the study intersections operate within the City’s adopted standards in the Near Term plus Project scenario.



6.0 CUMULATIVE (YEAR 2040) CONDITIONS

The Cumulative condition represents conditions at the buildout of the City's General Plan and other regional planning documents such as Plan Bay Area. Based on a review of previously completed transportation analyses for projects in the City of Santa Rosa, City staff indicated that 2040 is the Cumulative horizon year, which would incorporate the City's 2035 General Plan and Plan Bay Area. The 2040 horizon year is also consistent with the horizon year for the Sonoma County Transportation Authority (SCTA) countywide travel demand model.

To evaluate the potential effect of traffic generated by the proposed Project on the surrounding street system, volume estimates representing Cumulative without Project Conditions were prepared. Traffic conditions without the Project under this future scenario reflect traffic increases due to nearby and regional development along with background roadway network changes and street improvements. The forecasted Cumulative without Project Conditions traffic volumes were then used as the baseline to identify if the study intersections would operate within the City's LOS standards. This chapter presents the results of the LOS calculations under Cumulative Conditions both with and without the Project.

6.1 CUMULATIVE (YEAR 2040) CIRCULATION ANALYSIS

This subsection identifies the results of the analysis of Cumulative baseline conditions. This section summarizes intersection LOS for an informational non-CEQA analysis to ensure consistency with the goals of the City of Santa Rosa's General Plan 2035 and the *Guidance for the Preparation of Traffic Operational Analysis*.

6.1.1 CUMULATIVE CONDITIONS TRAFFIC VOLUMES

Traffic volumes for Cumulative Conditions are comprised of Existing Conditions volumes plus traffic generated by anticipated local and regional land use growth. The SCTA travel demand model incorporates most arterial and collector roadways throughout the City of Santa Rosa and is generally a reasonable tool for use in the analysis of City arterials (such as Guerneville Road, Marlow Avenue, etc.) and other major collector roadways.

After reviewing the structure of the model traffic analysis zone (TAZ) system and roadway network detail in and around the Project site and study intersections, it was determined that the SCTA travel demand model would be a suitable tool for the estimation of future year demand volumes. The Year 2040 model used in the development of the traffic volume forecasts presented in this chapter incorporated the buildout of the City roadway system, including planned expansions such as Farmers Lane Extension project and the US



101/Hearn Avenue interchange project. These projects may result in substantial traffic volume redistribution effects in the City, although their effects in the immediate Project study area would be limited. Therefore, the SCTA model was used in lieu of other forecasting methods that would not reflect potential changes in traffic assignment throughout the City.

The following presents the specific steps used to develop Year 2040 forecasts from the model:

- **Step 1** – Run the Base Year (2019) model to estimate AM and PM peak hour traffic volumes.
- **Step 2** – Run the Year 2040 model to estimate AM and PM peak hour traffic volumes.
- **Step 3** – Compare total entering volumes at study intersections to develop growth rates
- **Step 4** – Check for reasonableness (e.g., ensure that volumes do not drop below Existing levels, or grow exponentially unless there is a specific reason).

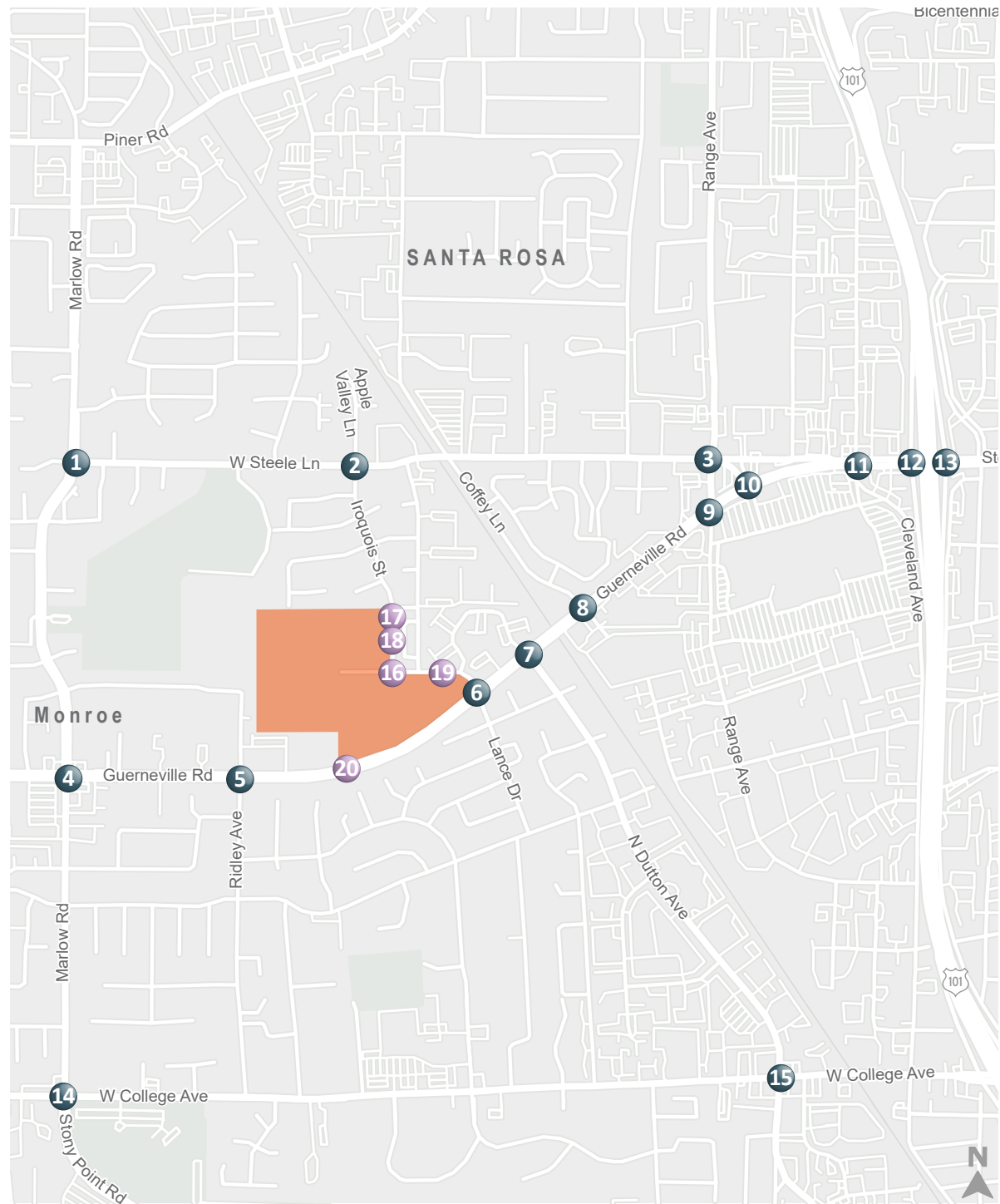
The above process relies on the Base Year 2019 model for the estimation of traffic volume growth. It was reasoned that the Base Year 2019 model would be suitable for forecasting as it would represent traffic volume conditions before the effects of the COVID-19 pandemic and thus would not be affected by suppressed travel conditions resulting from the pandemic.

The comparison of total intersection entering volumes at the study intersections between the Year 2040 and Year 2019 model runs indicated a maximum AM or PM peak hour growth rate of about 0.7% per year, with many study intersections exhibiting a growth rate of less than 0.5% per year. These values appear to be reasonable given that the area surrounding the Project study area is largely built out. However, to be conservative, a 1.0% per year growth rate was applied to the Existing Conditions volumes to arrive at Cumulative without Project volumes.

The Cumulative Conditions intersection turning movement forecasts are presented in **Figure 10**.

6.1.2 CUMULATIVE WITH PROJECT TRAFFIC VOLUMES

Net new trips from the proposed Project were added to the Cumulative without Project Conditions traffic projections to develop traffic volumes for Cumulative with Project Conditions. The resulting volumes are presented on **Figure 11**.



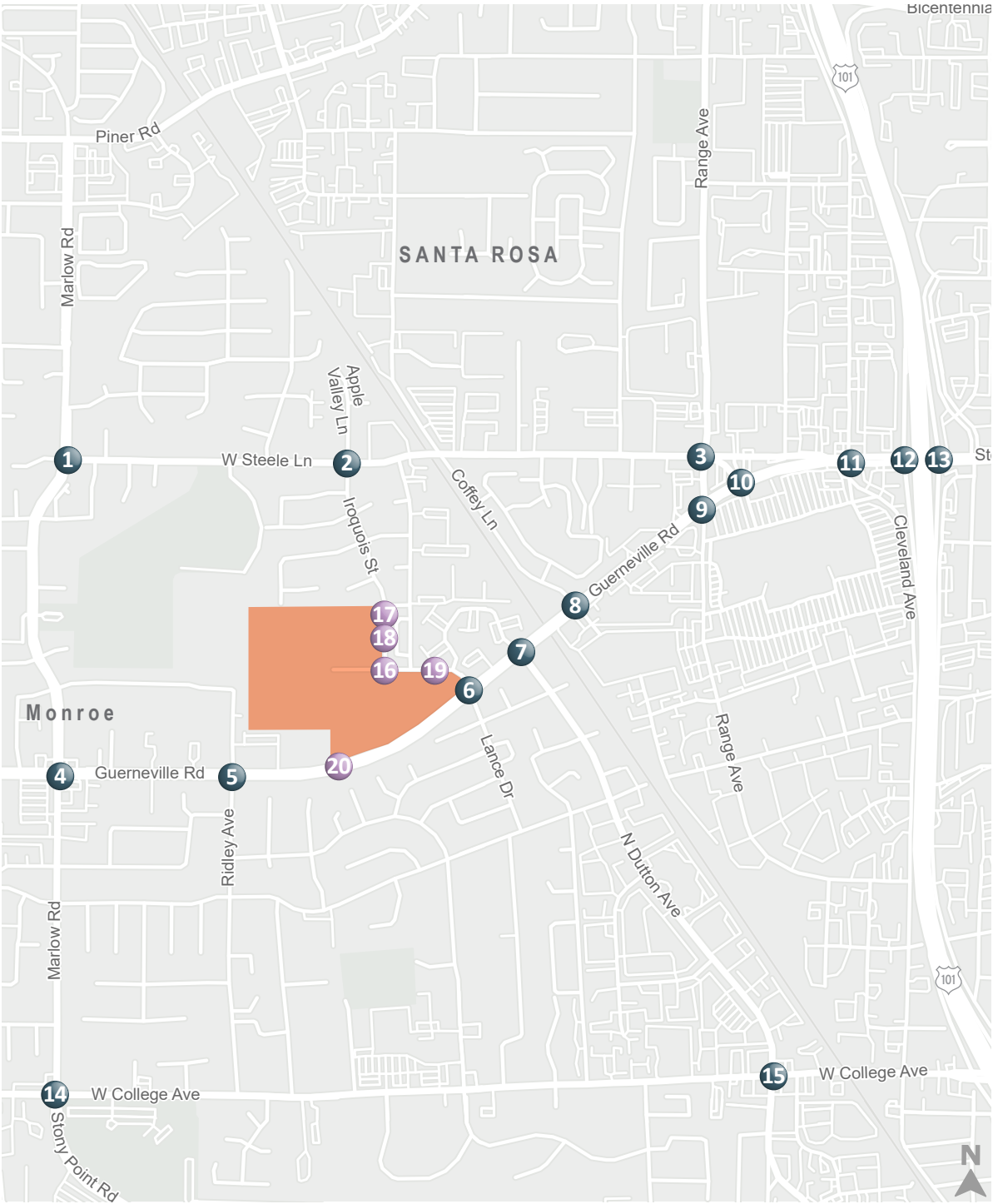
1. Marlow Rd/Marlow Ct/W Steele Ln 	2. Apple Valley Ln/Iroquois St/W Steele Ln 	3. Range Ave/W Steele Ln 	4. Marlow Rd/Guerneville Rd 	5. Ridley Ave/Guerneville Rd
6. Lance Dr/Guerneville Rd 	7. Westberry Dr/N Dutton Ave/Guerneville Rd 	8. Coffey Ln/Herbert St/Guerneville Rd 	9. Range Ave/Guerneville Rd 	10. Steele Wy/Guerneville Rd
11. Cleveland Ave/Guerneville Rd 	12. US 101 SB Ramps/Guerneville Rd 	13. US 101 NB Ramps/Guerneville Rd/Steele Ln 	14. Marlow Rd/Stony Point Rd/W College Ave 	15. N Dutton Ave/W College Ave
16. Iroquois St/Lance Dr 	17. Iroquois St/Project Driveway (1) 	18. Iroquois St/Project Driveway (2) 	19. Project Driveway (3)/Lance Dr 	20. Project Driveway (4)/Guerneville Rd

XX (YY) AM (PM) Peak Hour Traffic Volumes

Signalized Intersection Stop Sign

Project Site Study Intersection Project Driveway Study Intersection





1. Marlow Rd/Marlow Ct/W Steele Ln Marlow Rd Marlow Ct W Steele Ln	2. Apple Valley Ln/Iroquois St/W Steele Ln Apple Valley Ln W Steele Ln Iroquois St	3. Range Ave/W Steele Ln Range Ave W Steele Ln	4. Marlow Rd/Guerneville Rd Marlow Rd Guerneville Rd	5. Ridley Ave/Guerneville Rd Ridley Ave Guerneville Rd
6. Lance Dr/Guerneville Rd Lance Dr Guerneville Rd	7. Westberry Dr/N Dutton Ave/Guerneville Rd Westberry Dr Guerneville Rd N Dutton Ave	8. Coffey Ln/Herbert St/Guerneville Rd Coffey Ln Guerneville Rd Herbert St	9. Range Ave/Guerneville Rd Range Ave Guerneville Rd	10. Steele Wy/Guerneville Rd Steele Wy Guerneville Rd
11. Cleveland Ave/Guerneville Rd Cleveland Ave Guerneville Rd	12. US 101 SB Ramps/Guerneville Rd US 101 SB Ramps Guerneville Rd	13. US 101 NB Ramps/Guerneville Rd/Steele Ln US 101 NB Ramps Guerneville Rd Steele Ln	14. Marlow Rd/Stony Point Rd/W College Ave Marlow Rd Stony Point Rd W College Ave	15. N Dutton Ave/W College Ave N Dutton Ave W College Ave
16. Iroquois St/Lance Dr Iroquois St Lance Dr	17. Iroquois St/Project Driveway (1) Iroquois St Project Driveway (1)	18. Iroquois St/Project Driveway (2) Iroquois St Project Driveway (2)	19. Project Driveway (3)/Lance Dr Lance Dr Project Driveway (3)	20. Project Driveway (4)/Guerneville Rd Project Driveway (4) Guerneville Rd

XX (YY) AM (PM) Peak Hour Traffic Volumes
Signalized Intersection
Stop Sign
Project Site
Study Intersection
Project Driveway Study Intersection



Figure 11

Cumulative with Project Conditions Peak Hour Intersection Traffic Volumes, Lane Configurations, and Traffic Controls



Intersection LOS was calculated for Cumulative without Project Conditions and Cumulative with Project Conditions. The results of the analyses are used to identify potential deficiencies within the operations of the roadway system. Traffic signal timings at the study intersections were optimized in the Cumulative and Cumulative with Project Conditions to account for ongoing infrastructure maintenance conducted by the City.

Table 11 provides the results of the intersection LOS calculations, while **Appendix B** contains the corresponding calculation sheets. The changes in delay and LOS between Cumulative and Cumulative with Project conditions would not result in any violations of the City’s adopted standards.

TABLE 11: CUMULATIVE CONDITIONS INTERSECTION LEVELS OF SERVICE

	Intersection	Control Type ¹	Peak Hour ²	Cumulative without Project Conditions		Cumulative with Project Conditions	
				Delay ³	LOS ⁴	Delay ³	LOS ⁴
1	Marlow Road/West Steele Lane ⁵	Signalized	AM PM	33.7-41.8 37.1-55.1	C-D D-E	33.6-42.9 26.9-59.2	C-D D-E
2	Iroquois Street-Apple Valley Lane/West Steele Lane	SSSC	AM PM	6.7 (53.7) 6.0 (42.9)	A (F) A (E)	9.6 (71.2) 7.8 (55.4)	A (F) A (F)
3	Range Avenue/West Steele Lane	Signalized	AM PM	18.4-25.2 26.5-37.3	B-C C-D	18.4-25.2 26.5-37.3	B-C C-D
4	Guerneville Road/Marlow Road	Signalized	AM PM	48.1-56.0 55.7-59.8	D-E E	53.0-55.9 57.9-60.7	D-E E
5	Guerneville Road/Ridley Avenue ⁵	Signalized	AM PM	5.0-8.6 2.1-3.0	A A	4.9-6.7 2.2-3.1	A A
6	Guerneville Road/Lance Drive	Signalized	AM PM	44.6-49.4 35.7-51.9	D D	44.6-56.6 37.2-61.2	D-E D-E
7	Guerneville Road/North Dutton Avenue	Signalized	AM PM	39.6-50.9 28.4-34.7	D C-D	52.3-75.0 29.9-49.4	D-E C-D
8	Guerneville Road/Coffey Lane	Signalized	AM PM	33.4-97.5 47.9-54.7	C-F D	31.5-118.5 47.9-61.8	C-F D-E
9	Guerneville Road/Range Avenue	Signalized	AM PM	45.0-53.5 43.8-54.5	D D	45.3-53.0 46.7-55.0	D D-E
10	Guerneville Road/Steele Way	Signalized	AM PM	36.5-42.0 42.8-53.3	D D	36.8-41.4 43.8-54.3	D D
11	Guerneville Road/Cleveland Avenue	Signalized	AM PM	44.6-56.2 52.5-56.8	D-E D-E	49.9-56.4 59.2-68.5	D-E E



TABLE 11: CUMULATIVE CONDITIONS INTERSECTION LEVELS OF SERVICE

	Intersection	Control Type ¹	Peak Hour ²	Cumulative without Project Conditions		Cumulative with Project Conditions	
				Delay ³	LOS ⁴	Delay ³	LOS ⁴
12	Guerneville Road/US 101 Southbound Ramps ⁵	Signalized	AM PM	27.5-40.9 29.2-41.4	C-D C-D	27.1-40.4 29.0-41.0	C-D C-D
13	Guerneville Road/US 101 Northbound Ramps ⁵	Signalized	AM PM	25.0-34.7 29.0-39.0	C C-D	24.9-34.4 29.4-39.2	C C-D
14	Marlow Road-Stony Point Road/West College Avenue	Signalized	AM PM	42.2-55.0 p49.0-56.2	D D-E	42.2-55.1 50.0-56.7	D-E D-E
15	North Dutton Avenue/West College Avenue	Signalized	AM PM	45.0-58.4 52.7-59.8	D-E D-E	45.3-58.3 54.6-60.4	D-E D-E
16	Lance Drive/Iroquois Street	AWSC	AM PM	7.9 7.4	A A	8.8 9.0	A A
17	Iroquois Street/Project Driveway (1)	SSSC	AM PM	<i>Intersection does not exist in this scenario.</i>		0.5 (9.1) 0.5 (9.1)	A (A) A (A)
18	Iroquois Street/Project Driveway (2)	SSSC	AM PM	<i>Intersection does not exist in this scenario.</i>		0.6 (9.1) 0.6 (9.2)	A (A) A (A)
19	Project Driveway (3)/Lance Drive	SSSC	AM PM	<i>Intersection does not exist in this scenario.</i>		1.3 (10.0) 1.2 (9.8)	A (B) A (A)
20	Guerneville Road/Project Driveway (4)	SSSC	AM PM	<i>Intersection does not exist in this scenario.</i>		0.3 (22.7) 0.5 (43.8)	A (C) A (E)

Notes

1. Signalized = Traffic Signal Control, SSSC = Side-Street Stop-Controlled, AWSC = All-Way Stop-Controlled

2. AM = Weekday morning peak hour, PM = Weekday evening peak hour

3. Whole intersection average delay reported for signalized intersections and all-way stop-controlled intersections. Side-street stop-controlled delay presented as Whole Intersection Average Delay (Worst Movement Delay). Delay calculated per *HCM 6th Edition* methodologies.

4. LOS designation per *HCM 6th Edition*.

5. The overall average delay at an intersection may slightly decrease with the addition of project trips. This may occur when trips are added to an approach with delay less than the average intersection delay, and the approach volume is under its capacity.

Bold indicates unacceptable operations.

Source: Fehr & Peers, June 2024.

6.1.3 CUMULATIVE WITH PROJECT SIGNAL WARRANT ANALYSIS

The peak-hour signal warrants (Warrant 3A and Warrant 3B) from the *Manual on Uniform Traffic Control Devices* (MUTCD) were used to evaluate unsignalized intersections that operate unacceptably under Cumulative with Project conditions to determine if a traffic signal is warranted (see **Appendix C**).



The analysis indicates that Intersection 2 (Iroquois Street-Apple Valley Lane/West Steele Lane) and Intersection 20 (Guerneville Road/Project Driveway (4)) do not meet Warrant 3A or Warrant 3B in the AM or PM peak hour. This analysis is intended to examine the general correlation between the current level of development in the region and the need to install new traffic signals. It estimates traffic levels compared against a sub-set of the standard traffic signal warrants recommended in the Federal Highway Administration *Manual on Uniform Traffic Control Devices* and associated California MUTCD guidelines.

This analysis should not serve as the only basis for deciding whether and when to install a signal. To reach such a decision, the full set of warrants should be investigated by an experienced engineer based on field-analysis rather than forecast traffic data and a thorough study of traffic and roadway conditions. Furthermore, the decision to install a signal should not be based solely upon the warrants, since the installation of signals can lead to certain types of collisions. The appropriate agency should undertake regular monitoring of actual traffic conditions and collision data, and timely re-evaluation of the full set of warrants to prioritize and program intersections for signalization.

6.1.4 CUMULATIVE WITH PROJECT MULTI-WAY STOP APPLICATION

The multi-way stop control application from the *Manual on Uniform Traffic Control Devices* (MUTCD) was used to evaluate the unsignalized intersections that operate unacceptably under Cumulative with Project conditions to determine if an all-way stop control is warranted (see **Appendix C**).

The analysis indicated that Intersection 2 (Iroquois Street-Apple Valley Lane/West Steele Lane) does not meet the criterion for an all-way stop based on the crash history and vehicular, pedestrian, and bicycle volume entering the intersection from the minor street.

To reach a decision on implementing an all-way stop, all guidance from Section 2B.07 from the MUTCD should be investigated by an experienced engineer based on field-analysis rather than forecast traffic data and a thorough study of traffic and roadway conditions. Furthermore, the decision to install an all-way stop should not be based solely upon the application, since change in control can lead to certain types of collisions. The appropriate agency should undertake regular monitoring of actual traffic conditions and collision data, and timely re-evaluation to prioritize and program intersection controls.

6.1.5 CUMULATIVE WITH PROJECT CONDITIONS POLICY VIOLATIONS

This section of the report evaluates Cumulative with Project Conditions intersection LOS results presented in **Table 11** against the City of Santa Rosa's Level of Service standards.

Intersection 1: Marlow Road/West Steele Lane – The intersection is projected to operate at a deficient LOS E during PM peak hour under Cumulative with Project Conditions. The addition of project traffic would not increase average peak hour delay at the intersection by more than 5.0 seconds and would not increase the



volume-to-capacity ratio by more than 0.02 in the PM peak hour. Therefore, the City's LOS policies would not be violated at this intersection.

Intersection 2: Iroquois Street-Apple Valley Lane/West Steele Lane – This intersection's worst movement is projected to operate at a deficient LOS F during the AM and PM peak hour under Cumulative with Project Conditions. The addition of Project traffic would increase average peak hour delay at the intersection's worst movement by more than 5.0 seconds, but the intersection does not meet the peak-hour signal warrants or all-way stop control application in the AM or PM peak hours. Therefore, the City's LOS policies would not be violated at this intersection.

Intersection 4: Guerneville Road/Marlow Road – This intersection is projected to operate at a deficient LOS E during the AM and PM peak hour under Cumulative with Project Conditions. The addition of Project traffic would not increase average peak hour delay at the intersection by more than 5.0 seconds and would not increase the volume-to-capacity ratio by more than 0.02 in the PM peak hour. Therefore, the City's LOS policies would not be violated at this intersection.

Intersection 6: Guerneville Road/Lance Drive – This intersection is projected to operate at a deficient LOS E during the AM and PM peak hour under Cumulative with Project Conditions. The adaptive signals allow for the signal to dynamically change within the peak hour and thus operate within the City's adopted standards.

Intersection 7: Guerneville Road/North Dutton Avenue – The intersection is projected to operate at a deficient LOS E during the AM peak hour under Cumulative with Project Conditions. The adaptive signals allow for the signal to dynamically change within the peak hour and thus operate within the City's adopted standards.

Intersection 8: Guerneville Road/Coffey Lane – The intersection is projected to operate at a deficient LOS E during the AM and PM peak hours under Cumulative with Project Conditions. The adaptive signals allow for the signal to dynamically change within the peak hour and thus operate within the City's adopted standards.

Intersection 9: Guerneville Road/Range Avenue – The intersection is projected to operate at a deficient LOS E during the PM peak hour under Cumulative with Project Conditions. The adaptive signals allow for the signal to dynamically change within the peak hour and thus operate within the City's adopted standards.

Intersection 11: Guerneville Road/Cleveland – The intersection is projected to operate at a deficient LOS E during the AM and PM peak hours under Cumulative with Project Conditions. The addition of Project traffic would not increase average peak hour delay at the intersection by more than 5.0 seconds and would not increase the volume-to-capacity ratio by more than 0.02 in the AM peak hour. The adaptive signals allow for the signal to dynamically change within the PM peak hour. Therefore, the intersection would operate within the City's adopted standards.



Intersection 14: Marlow Road-Stony Point Road/West College Avenue – This intersection is projected to operate at a deficient LOS E during the AM and PM Peak hours under Cumulative with Project Conditions. The adaptive signals allow for the signal to dynamically change within the peak hour and thus operate within the City's adopted standards.

Intersection 15: North Dutton Avenue/West College Avenue – This intersection is projected to operate at a deficient LOS E during the AM and PM peak hours under Cumulative with Project Conditions. The addition of Project traffic would not increase average peak hour delay at the intersection by more than 5.0 seconds and would not increase the volume-to-capacity ratio by more than 0.02 in the AM and PM peak hour. Therefore, the City's LOS policies would not be violated at this intersection.

Intersection 20: Guerneville Road/Project Driveway (4) – This intersection's worst movement is projected to operate at a deficient LOS E during the PM peak hour under Cumulative with Project Conditions. However, the proposed Project driveway does not meet the peak-hour signal warrants for either AM or PM peak hours, so the installation of a traffic signal is not required. Therefore, the City's LSO policies would not be violated at this intersection.

The results of the intersection operations analysis indicate that other study intersections would continue to operate at LOS D or better after the addition of Project trips. Based on the criteria presented in **Section 1.3.4**, the study intersections operate within the City's adopted standards.



7.0 SITE PLAN EVALUATION AND RECOMMENDATIONS

This chapter analyzes site access and internal circulation for vehicles, pedestrians, bicycles, and transit vehicles. Recommendations are provided to address on-site vehicle circulation issues such as improving wayfinding and emergency vehicle circulation. Active and transit mode recommendations include the provision of pedestrian and bicycle facilities and direct connections, and efficient linkages with existing transit stops external to the site. When available, the final building-plan-level site improvement plans should also be reviewed by City staff to identify and address any transportation issues that cannot be identified based on a review of the conceptual site plan before the Project is built.

7.1 MOTOR VEHICLE SITE ACCESS AND CIRCULATION

7.1.1 VEHICULAR SITE ACCESS AND CIRCULATION

The Project, as currently proposed, would provide access to the public circulation system through the use of one driveway on Guerneville Road, two driveways on Lance Drive and three driveways on Iroquois Street. An additional emergency vehicle access only driveway would be provided at the north property line at the end of Pawnee Street. The driveway at the Lance Drive/Iroquois Street intersection is anticipated to be the primary entry point as it serves the centermost areas of the development. The easternmost driveway on Lance Drive is expected to receive a higher demand than the northernmost driveways on Iroquois Street and the southern driveway on Guerneville Road due to the location of retail space on the eastern part of the development. Further the southern driveway on Guerneville Road is expected to receive a higher demand than the northernmost driveways on Iroquois Street due to the location of the multifamily residences and being that Guerneville Road is a major roadway. The main driveway intersection at Lance Drive and Iroquois Drive is anticipated to be all-way stop-controlled, while the rest of the driveways are anticipated to be side street stop controlled. A driveway on the northwestern most part of the Project at the end of Pawnee Street is proposed to provide emergency vehicle access only.

The posted speed limit along Lance Drive and Iroquois Street is 25 miles per hour. According to Table 201.1 of the Caltrans *Highway Design Manual*, the stopping sight distance at 25 miles per hour is 150 feet. With the use of Google Earth, the sight distance along Lance Drive appears to be over 300 feet and the sight distance along Iroquois Street appears to be over 200 feet, indicating that the sight distance may be adequate. The posted speed limit along Guerneville Road is 40 miles per hour. The required stopping sight distance at 40 miles per hour is 300 feet. With the use of Google Earth, the sight distance along Guerneville Road appears to be roughly 600 feet, also indicating that the sight distance may be adequate.



Site Recommendation 1: The final site improvement plan should be reviewed by the Project's Civil Engineer to ensure adequate sight distance is maintained at all driveways and internal intersections. No objects (new signs, above ground utility boxes, landscaping, etc.) greater than three feet in height should be allowed within the driveway's sight distance triangles. The Civil Engineer should review available speed survey information from the City and adjust the required sight distance if necessary.

Site Recommendation 2: The final site plan for the Project should illustrate truck turning templates at Project driveways and internal roadways showing that applicable routes of travel provide sufficient space for emergency vehicles, trucks, and automobiles. The local Fire Marshall should be consulted to ensure that the appropriate design vehicle's turning template is accommodated at all driveways and internal intersections.

Analysis of the intersection driveways for the weekday AM and PM peak hours in all with Project scenarios (LOS worksheets included in **Appendix B**) indicate that the 95th percentile queue for vehicles exiting the Project site would be between one to two vehicles. The driveway throat depths at Lance Drive/Iroquois Street are anticipated to be longer than the others; a Synchro analysis under Cumulative Plus Project conditions still indicates relatively short 95th percentile queues, and thus the proposed throat distances are adequate to accommodate cumulative queuing. Overall, the proposed width and throat depth at the driveways is sufficient to accommodate queuing.

7.1.2 EMERGENCY VEHICLE ACCESS

Several factors determine whether a project has sufficient access for emergency vehicles, including the following:

- Number of access points (both public and emergency access only)
- Width of access points
- Width of internal roadways

The Project's access points on Guerneville Road and Lance Drive and a dedicated emergency vehicle only connection at north property line at the end of Pawnee would provide emergency vehicle access to the site.

Site Recommendation 3: In accordance with City and Sonoma County Fire District requirements and design standards, provide even surface pavement, appropriate signage, delineation, and other features at all emergency access points and internal roadways to accommodate emergency vehicles. As part of the project's final design and permitting process, seek and obtain approval from the Fire Marshall. All internal roadways and intersections should be of adequate width to meet Fire District standards and accommodate the design fire vehicle's turning radius.



The fire stations most likely to serve the site are the Santa Rosa Fire Department Station 2 and 3, located on Stony Point Road and Coffey Lane respectively. Both stations are approximately one mile away from the Project site. While the Project may increase traffic congestion in the vicinity of the Project, emergency vehicles would still retain the right to preempt traffic signals and use lights and sirens to indicate to drivers that they need to yield. Significant adverse Project impacts related to emergency vehicle access were not identified.

7.2 PEDESTRIAN, BICYCLE, AND TRANSIT ACCESS AND CIRCULATION

This section of the report addresses on-site facilities that provide pedestrian and bicycle access and circulation for the Project.

7.2.1 PEDESTRIAN ACCESS AND CIRCULATION

The Project would create a significant impact related to the pedestrian system if any of the following criteria are met:

- Disrupt existing pedestrian facilities; or
- Interfere with planned pedestrian facilities; or
- Create inconsistencies with adopted pedestrian system plans, guidelines, policies, or standards.

Pedestrian facilities on-site include a network of pathways and sidewalks around and between the buildings. The Project proposes to construct a Class I facility along the Project boundary on Guerneville Road, providing direct access to the Project site. The Project proposes no features that would be hazardous to pedestrian travel and does not conflict with any pedestrian facilities plans or programs. The following recommendation is provided to ensure the provision of adequate pedestrian access within the site.

Site Recommendation 4: As the site plan is finalized, safe and adequate pedestrian facilities should be provided throughout the site in accordance with City standards and ADA standards. ADA-compliant connections from the Guerneville Road, Lance Drive, and Iroquois Street sidewalks to all building entrances shall be provided. At all internal intersections, ADA compliant ramps shall be provided. Pedestrian paths should be identified and marked crosswalks installed at key pedestrian crossing locations.

The Project was not found to result in significant adverse impacts related to the pedestrian system.



7.2.2 BICYCLE ACCESS AND CIRCULATION

The Project would create a significant impact related to the bicycle system if any of the following criteria are met:

- Disrupt existing bicycle facilities; or
- Interfere with planned bicycle facilities; or
- Create inconsistencies with adopted bicycle system plans, guidelines, policies, or standards.

The Project proposes to construct a Class I facility along the Project boundary on Guerneville Road, providing direct access to the Project site. Bicycles would also be permitted on all internal roadways. The Project proposes no features that would be hazardous to bicycle travel and does not conflict with any bicycle facilities plans or programs. The Project would provide 286 long term and 50 short term bicycle parking spaces; however, the Project site plan does not currently illustrate the locations of the proposed bicycle parking.

Site Recommendation 5: In Section 7.3 of this report the relevant bicycle parking requirements are provided using the City Code and CALGreen+Tier 1 guidelines. Based on City Code, the Project provides a surplus of 117 long-term spaces and 50 short-term spaces. The current site plan does not indicate where bicycle parking will be located. Long-term bicycle parking should be located throughout the site, and short-term spaces focused around the retail space.

The Project was not found to result in significant adverse impacts related to bicycle transportation.

7.2.3 TRANSIT ACCESS

The Project would create a significant impact related to transit service if the following criteria are met:

- The project interferes with existing transit facilities or precludes the construction of planned transit facilities.

The Project is adjacent to an existing bus route operating along Guerneville Road with a westbound stop at Lance Drive and two bus stops at Ridley Avenue. Along West Steele Lane, there are bus stops at Apache Street and Northcoast Street that are served by Route 6 which provides eastbound and westbound boardings. The expected increase in passenger demand is not projected to exceed available transit capacity on the existing Route 15 nor Route 6. Additionally, the Project is less than a quarter mile from the SMART North Santa Rosa Station and just over a half mile from the Coddington Transit Hub. The Project proposes to relocate the existing bus stop at the northeast corner of Guerneville Road and Lance Drive and install a bus stop at the southeast corner of Guerneville Road and Lance Drive. The updated bus stop locations are



shown in Figure 12. The following recommendation is provided to ensure that adequate transit access to the site is provided.

Site Recommendation 6: Identify the most direct pedestrian path of travel to transit stops both eastbound and westbound on Guerneville Road. and Lance Drive and ensure that the primary bus stops on Guerneville Road. and Lance Drive serving the site are ADA compliant.

Although the Project will move the existing bus stop at the northeast corner of Guerneville Road and Lance Drive, the Project proposes no features which would conflict with existing or planned transit service, nor does it preclude future facilities. The Project is not expected to result in increases in ridership on local or regional transit facilities that would exceed its capacity.

The Project was not found to result in significant adverse impacts related to transit.

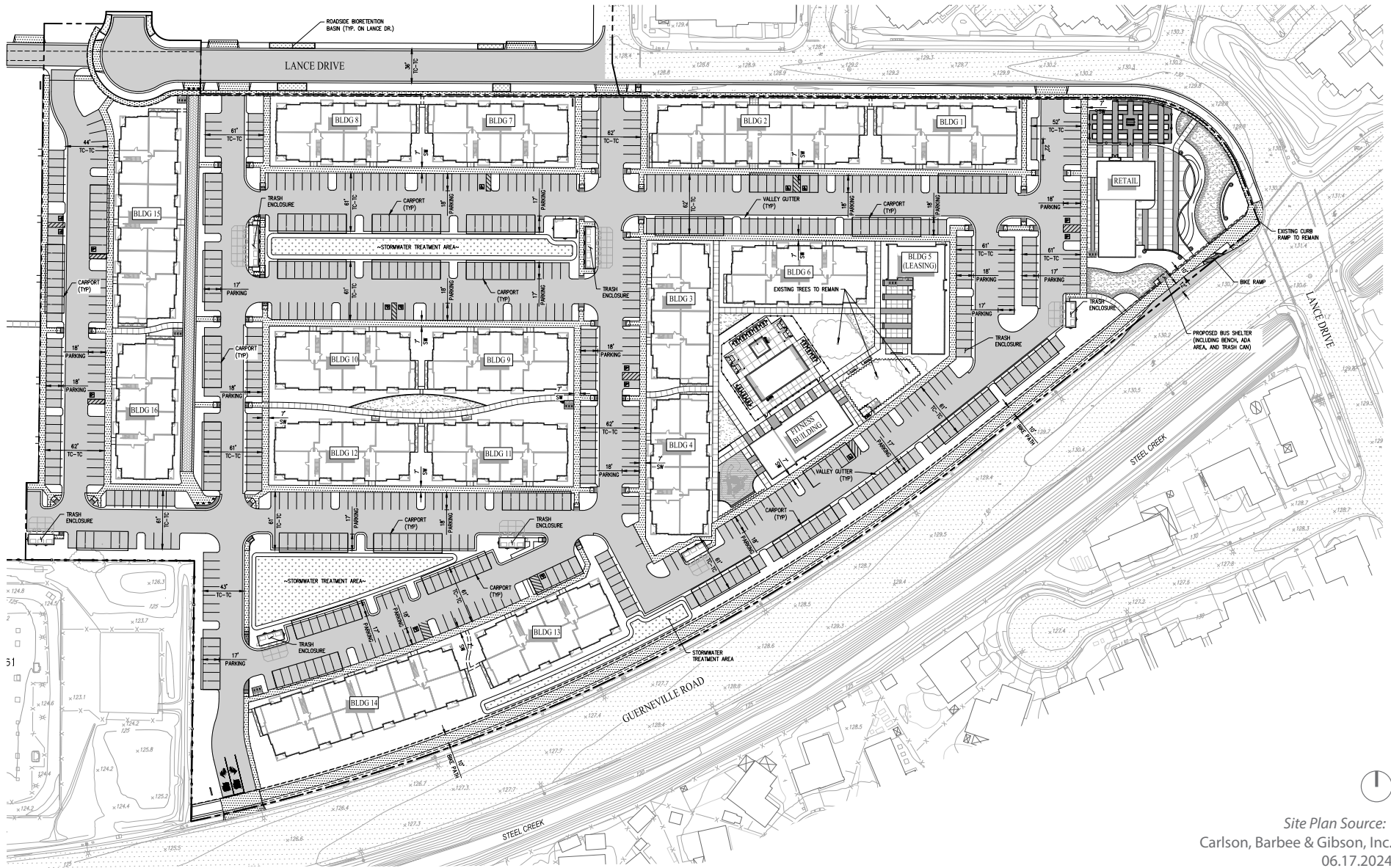


Figure 12

Proposed Bus Stop Locations



7.3 PARKING SUPPLY VERSUS CITY CODE

The City of Santa Rosa City Code notes the requirements for the number of off-street automobile and bicycle parking spaces to be provided by project type in §20-36.040, following the North Santa Rosa Area Specific Plan. The proposed Project includes a total of 1,491 vehicle parking spaces on site. **Table 12** presents a computation of the City Code-required automobile parking spaces for the proposed Project.

TABLE 12: CITY CODE VEHICLE PARKING REQUIREMENTS

Land Use Type	Code Requirements ¹	Amount of Land Use ²	Automobile Spaces
Single-Family Residential	<i>Not Applicable</i>	100 du	0
Multifamily Residential	1.5 auto spaces/du	672 du	1,008
General Retail	2.5 auto spaces/1000 sf	5,000 sf	13
City Code Vehicle Parking Requirement			1,021
Proposed Parking per Site Plan (Figure 2)			1,491
Proposed Site Plan Parking Surplus/[Deficit] Versus City Code			+470

Notes:
1. Required automobile parking spaces calculated per City Code Requirement §20-36.040, North Santa Rosa Station Area Specific Plan.
2. du = dwelling unit, sf = square feet
Source: Fehr & Peers, June 2024.

Based on the City Code calculations, the proposed parking supply for automobiles exceeds the required amount; therefore, satisfying the City Code requirements for automobiles for the Project.

CALGreen+Tier 1 notes the requirements for the number of long-term and short-term bicycle parking spaces to be provided by project type in Appendix A4.106.9 for multifamily buildings and Chapter 5.106.4 for nonresidential. **Table 13** presents the computation of the CALGreen+Tier 1-required bicycle parking spaces for the proposed Project. The computation of the City Code-required bicycle parking spaces is also provided.



TABLE 13: BICYCLE PARKING REQUIREMENTS

Land Use Type	Code Requirements		Amount of Land Use¹	Bicycle Spaces	
	Long-Term Parking	Short-Term Parking		Long-Term Parking	Short-Term Parking
City Code Bicycle Requirement - North Santa Rosa Station Area Specific Plan²					
Single-Family Homes	Not Applicable		100 du	Not Applicable	
Multifamily Apartments	1 bicycle space/4 du	Not Applicable	672 du	168	Not Applicable
General Retail	1 bicycle space/5,000 sf	Not Applicable	5,000 sf	1	Not Applicable
City Code Bicycle Parking Requirement				169	0
CALGreen+ Tier 1 Bicycle Requirement³					
Single-Family Homes	Not Applicable		100 du	Not Applicable	
Multifamily Residential	1 bicycle space/2 du	Not Applicable	672 du	336	Not Applicable
General Retail	5% of tenant-occupied retail auto spaces	5% of retail auto spaces	5,000 sf (13 spaces⁴)	1	1
CALGreen+Tier 1 Bicycle Parking Requirement				337	1
Proposed Parking per Site Plan (Figure 2)				286	50
Proposed Site Plan Parking Surplus/[Deficit] Versus City Code				117	50
Proposed Site Plan Parking Surplus/[Deficit] Versus CALGreen+Tier 1				[-51]	+49

Notes:

1. du = dwelling unit, sf = square feet, spaces = auto spaces

2. Required bicycle parking spaces calculated per City Code Requirement §20-36.040, North Santa Rosa Station Area Specific Plan.

3. Required bicycle parking spaces calculated per CALGreen+Tier 1 Appendix A4.106.9 and Chapter 5.106.4 for multifamily residential and nonresidential, respectively.

4. 13 spaces are calculated in Table 12, General Retail Automobile Spaces.

Source: Fehr & Peers, June 2024.

Based on City Code, 169 long-term bicycle parking spaces are required. The proposed parking supply provides a surplus of 117 long-term bicycle spaces and 50 short-term bicycle spaces relative to the City Code. Based on the CALGreen+Tier 1 calculations, the Project site requires 337 long-term bicycle parking spaces for the multifamily residential buildings, no bicycle parking for the single-family homes, and 1 long-term bicycle parking space and 1 short-term bicycle parking space for the general retail building. The



proposed bicycle parking supply is 336 total spaces, of which 286 are long-term parking spaces and 50 are short-term parking spaces. Although the proposed bicycle parking spaces exceeds the required number of short-term spaces, there is a deficit in long-term spaces of 51. To meet the CALGreen+Tier 1 bicycle parking requirement, it is recommended that the Project add 51 long-term bicycle parking spaces and, if needed, reduce the amount of short-term bicycle parking spaces to accommodate for this addition such that it does not fall below the required amount. Further, as noted in **Section 7.2.1**, the site plan should be updated to show the location(s) of the off-street bicycle parking spaces.

APPENDIX A: TRAFFIC COUNT DATA

PEAK HOURS

07:45 AM - 08:45 AM
NONE
04:30 PM - 05:30 PM

COUNT PERIODS

7:00 AM - 09:00 AM
NONE
4:00 PM - 06:00 PM

CONTROL

Signalized

TEV	2599	0	3198
	AM	NOON	PM
PHF	0.92		0.95

EASTBOUND

AM	NOON	PM
471	0	653
5	0	11
104	0	155
437	0	394
141	0	117
AM	NOON	PM

WESTBOUND

PM	NOON	AM
109	0	89
445	0	262
254	0	138
0	0	0
608	0	706
PM	NOON	AM

NORTHBOUND

PM	NOON	AM
1071	0	763
0	0	0
130	0	124
599	0	463
153	0	162
PM	NOON	AM

Marlow Rd

Totals (AM)

104	437	141	107	484	08
89	262	138	162	463	124

Totals (NOON)

0	0	0	0	0	0
0	0	0	0	0	0

Totals (PM)

155	394	117	109	445	254
130	599	153	162	463	124

Total Bikes (AM)

0	0	0	0	0	0
0	0	0	0	0	0

Total Bikes (NOON)

0	0	0	0	0	0
0	0	0	0	0	0

Total Bikes (PM)

0	0	0	0	0	0
0	0	0	0	0	0

Pedestrians (Crosswalks)

0	0	0	0	0	0
0	0	0	0	0	0

Guerneville Rd

EASTBOUND

AM	NOON	PM
481	0	800
1	0	1
19	0	4
673	0	609
25	0	33

CONTROL

Signalized

TEV	1344 AM	0 NOON	1552 PM
PHF	0.89		0.93

WESTBOUND

PM	NOON	AM
2	0	11
777	0	429
61	0	56
1	0	0
652	0	744

Guerneville Rd

PEAK HOURS

07:45 AM - 08:45 AM	04:15 PM - 05:15 PM
NONE	NONE

COUNT PERIODS

AM	NOON	PM
15	0	8
4	0	0
15	0	3
0	0	0
34	0	6

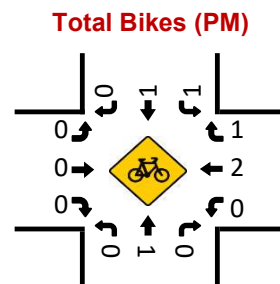
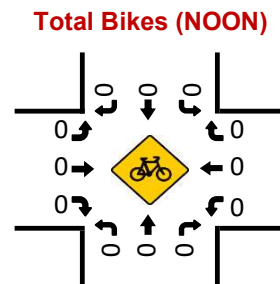
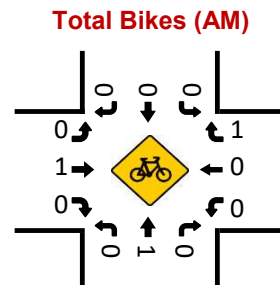
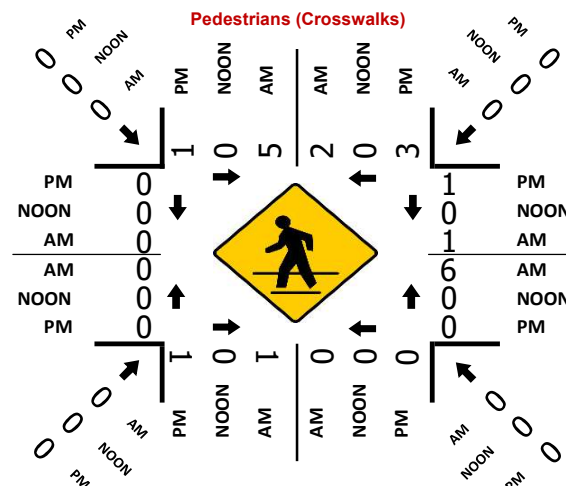
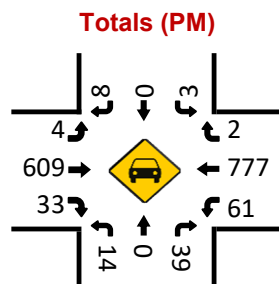
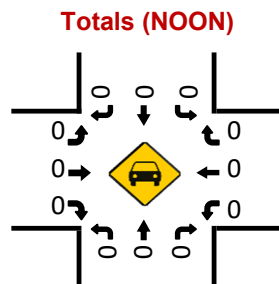
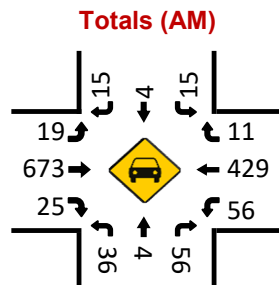
Ridley Ave

NORTHBOUND

PM	NOON	AM
94	0	85
0	0	0
14	0	36
0	0	4
39	0	56

Totals (AM)

Total Bikes (AM)

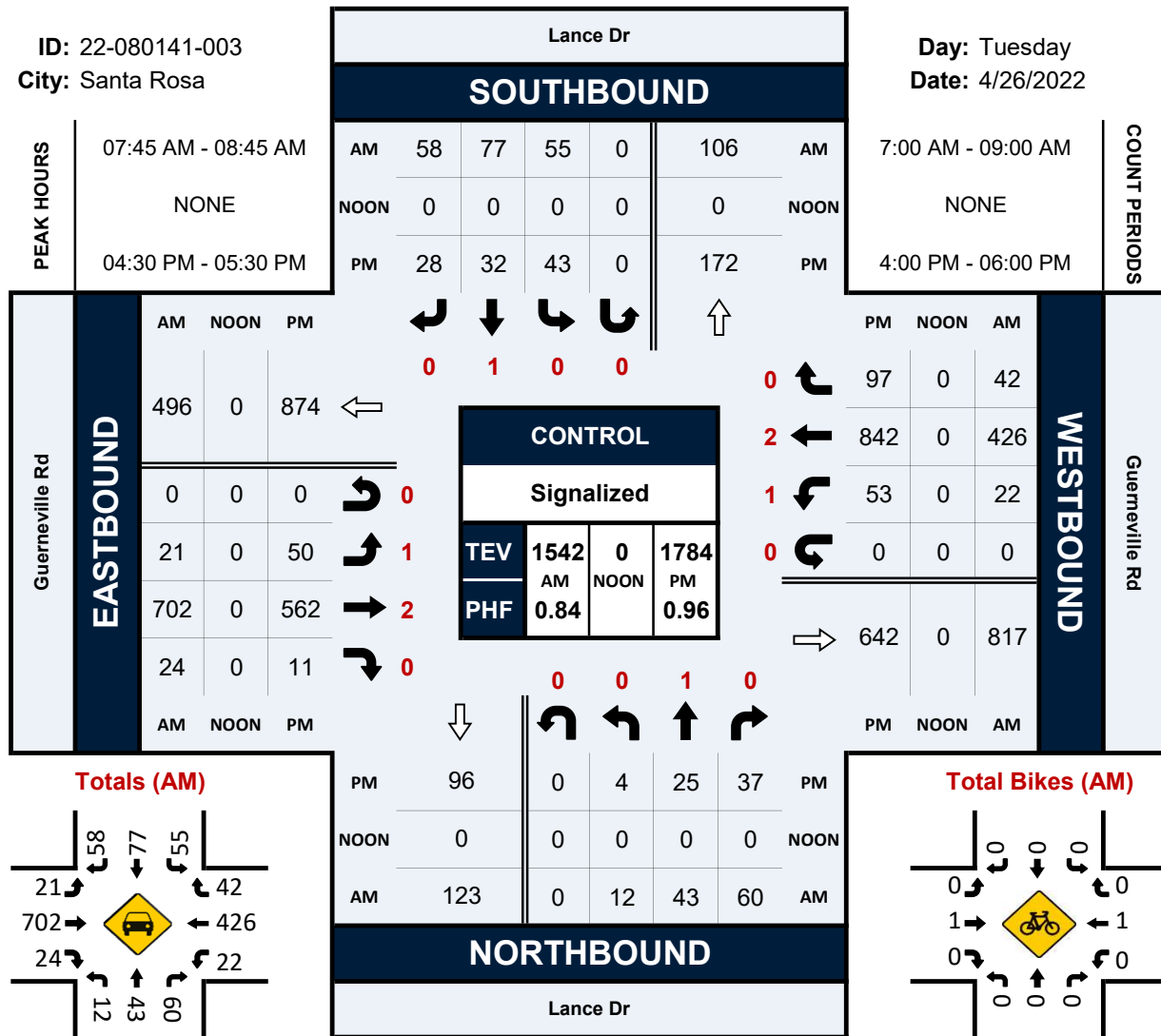


Lance Dr & Guerneville Rd

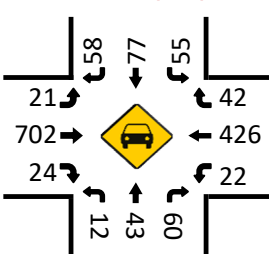
Peak Hour Turning Movement Count

ID: 22-080141-003
City: Santa Rosa

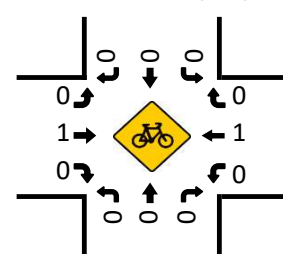
Day: Tuesday
Date: 4/26/2022



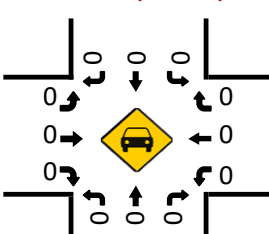
Totals (AM)



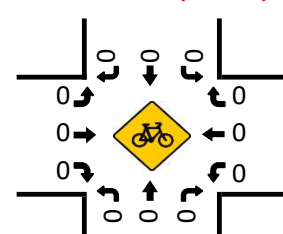
Total Bikes (AM)



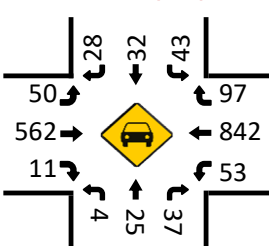
Totals (NOON)



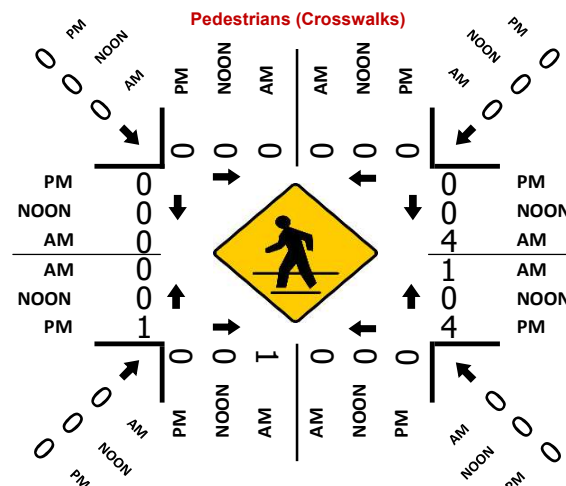
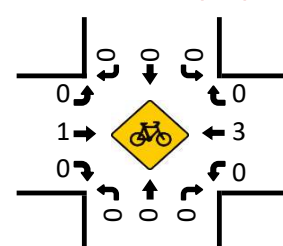
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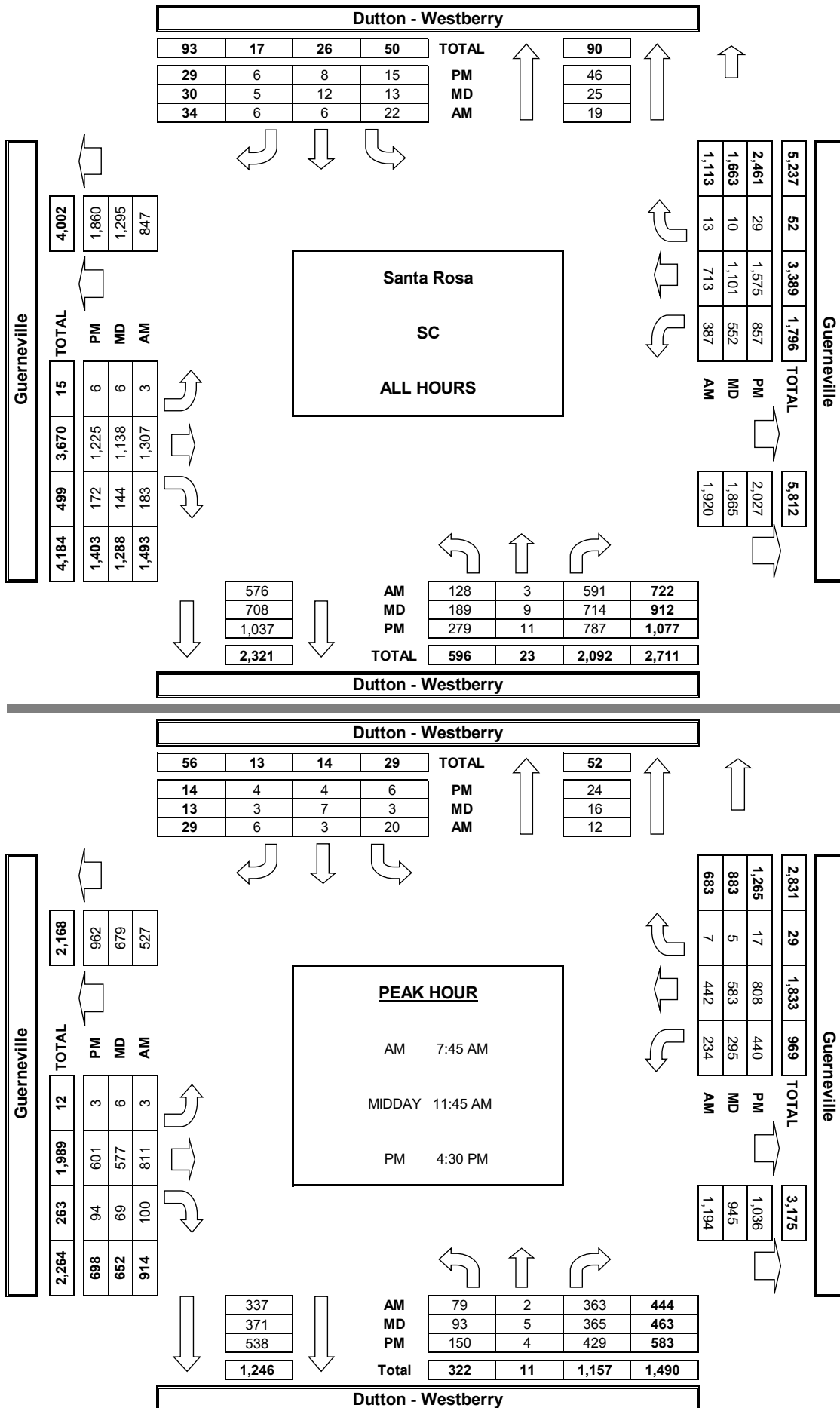
Totals (PM)



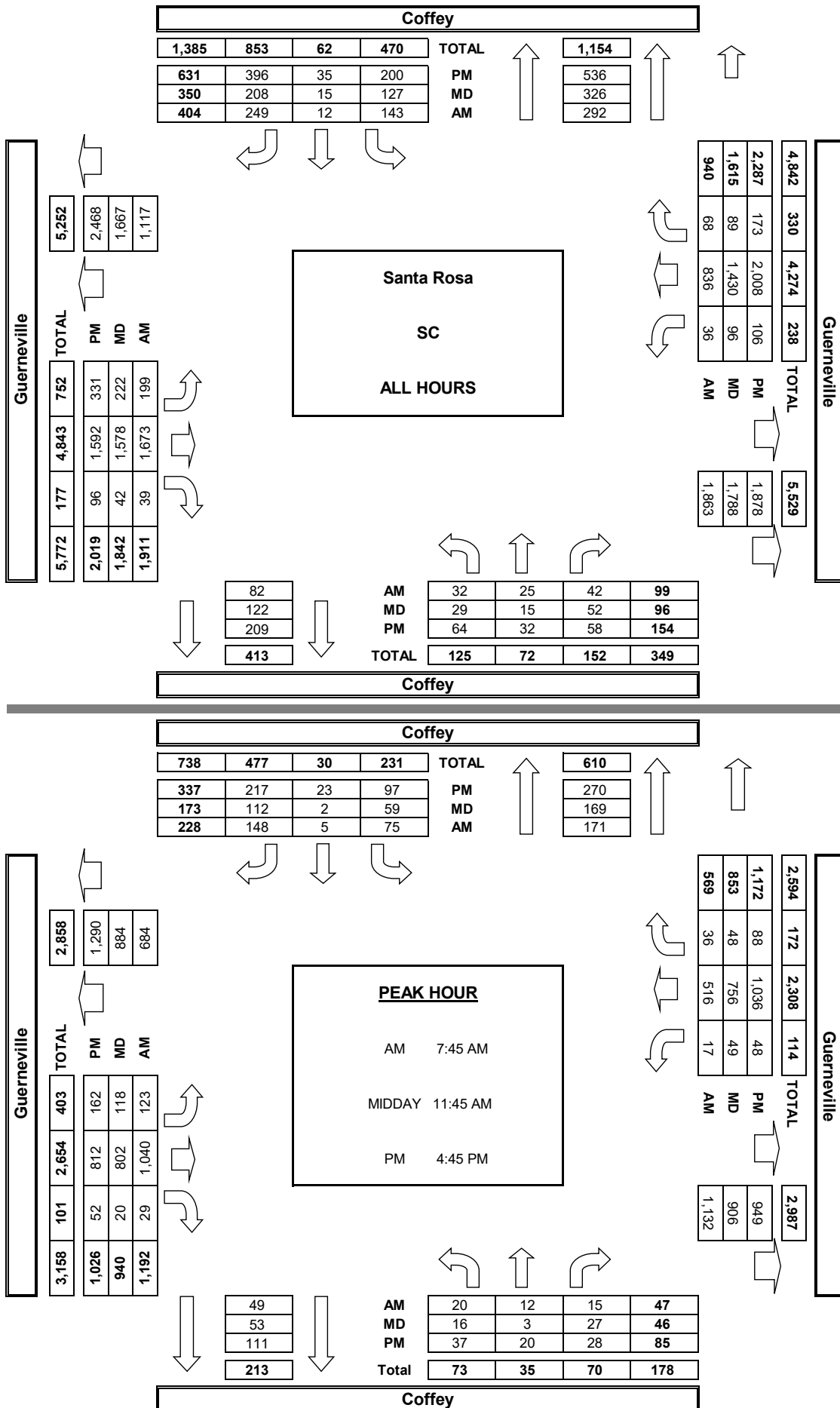
Total Bikes (PM)



AimTD LLC
TURNING MOVEMENT COUNTS



AimTD LLC
TURNING MOVEMENT COUNTS



Steele Wy & Guerneville Rd

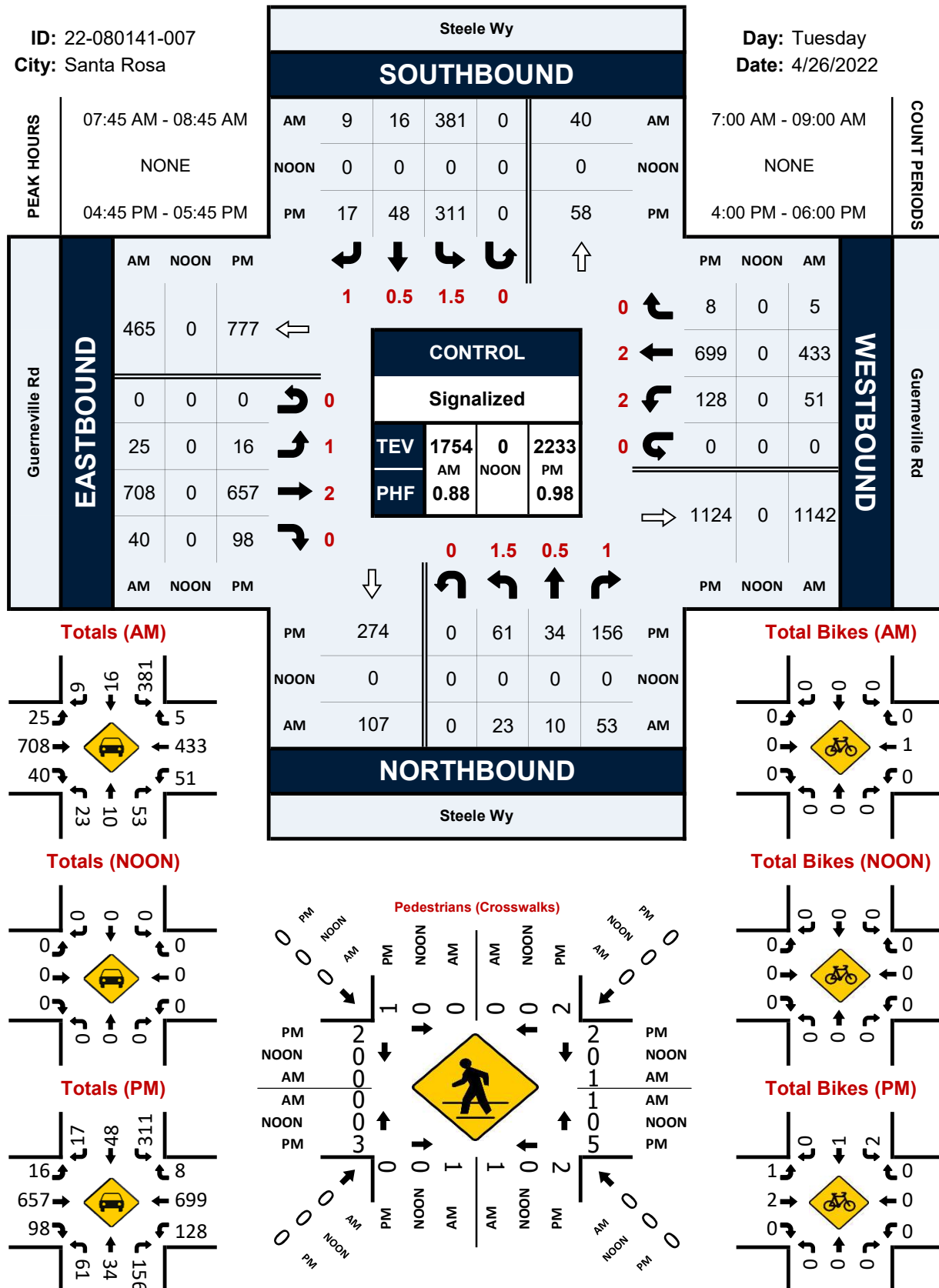
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City: Santa Rosa

Day: Tuesday

Date: 4/26/2022

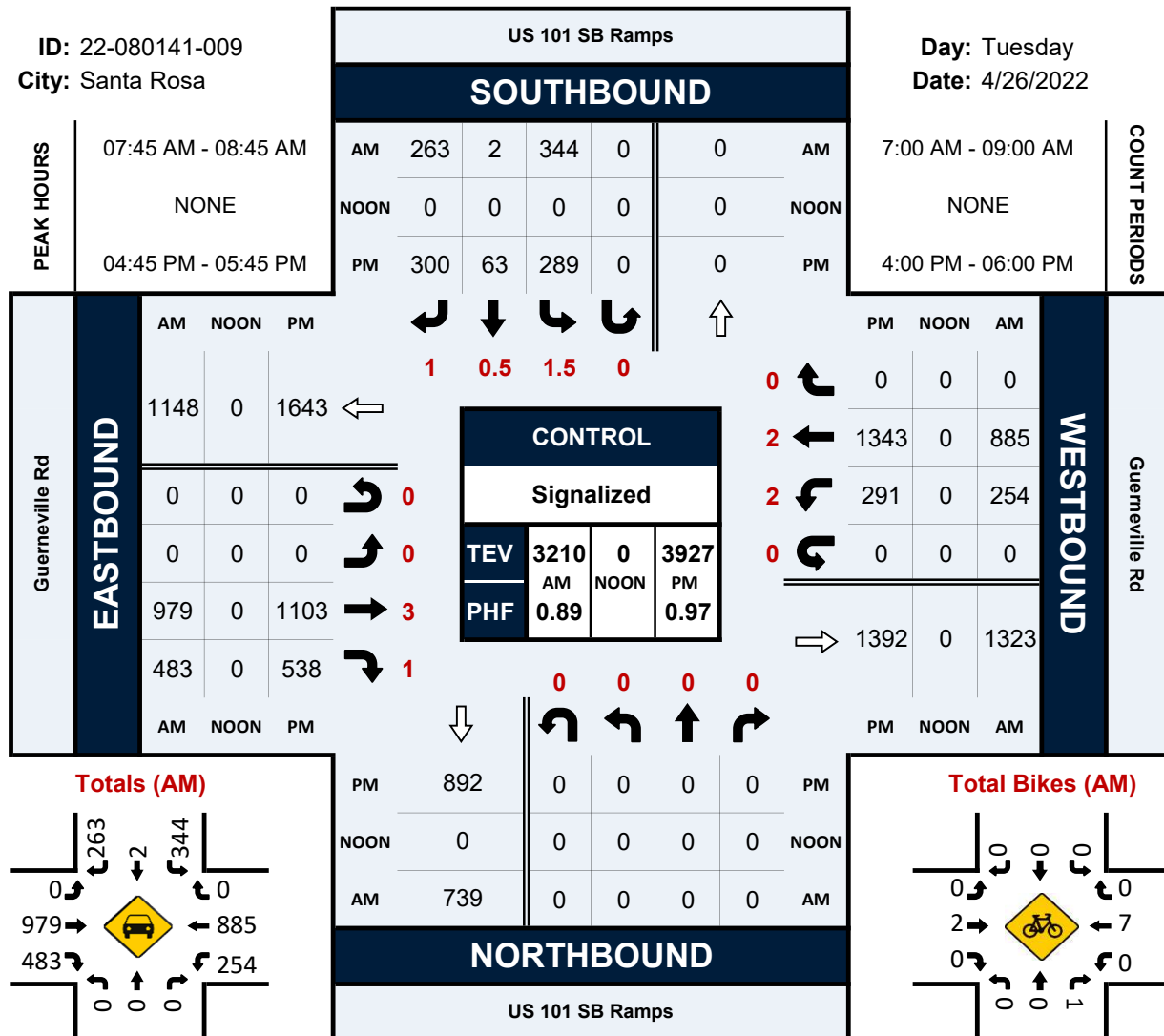


US 101 SB Ramps & Guerneville Rd

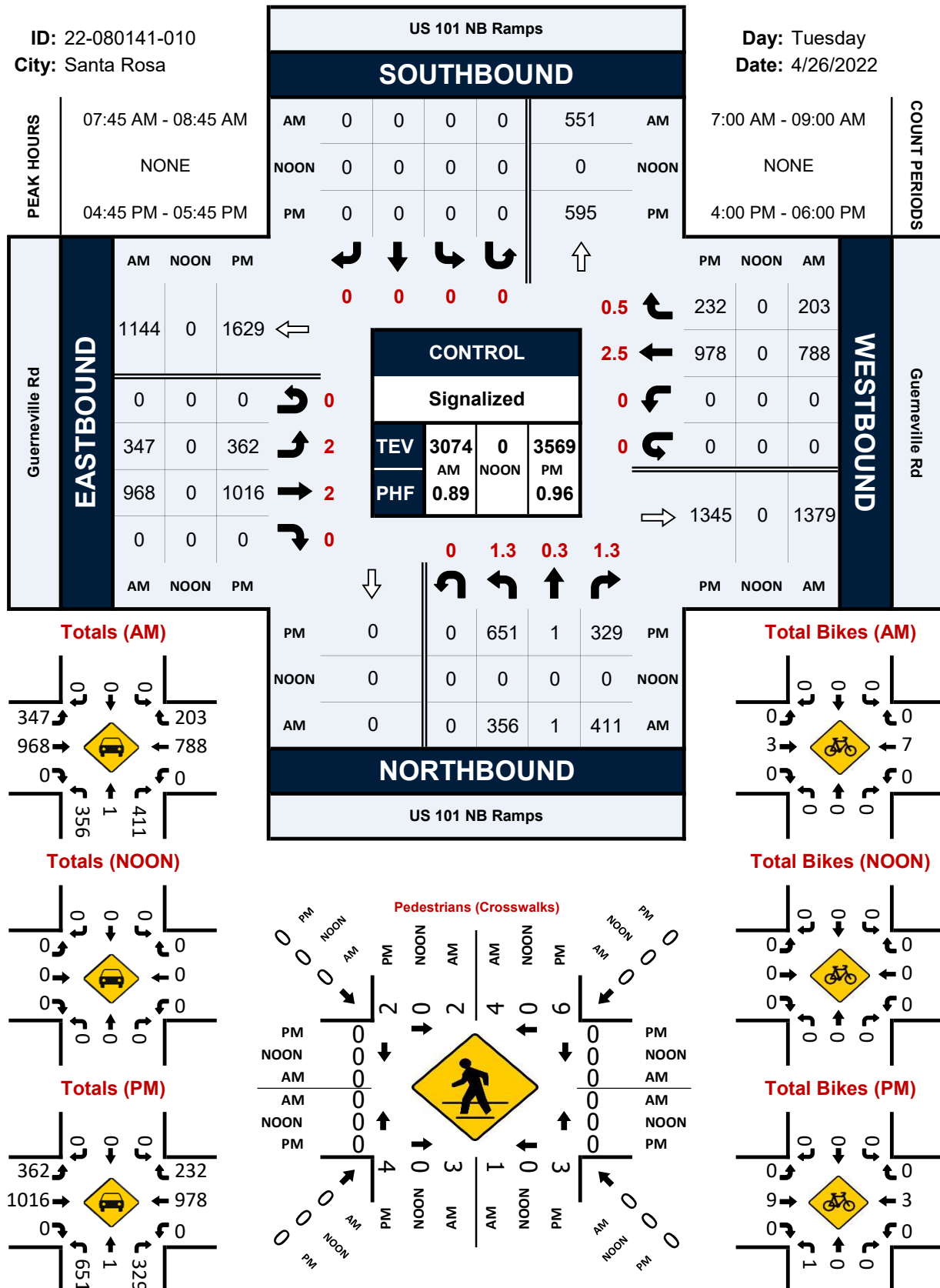
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ID: 22-080141-009
City: Santa Rosa

Day: Tuesday
Date: 4/26/2022



Day: Tuesday
Date: 4/26/2022

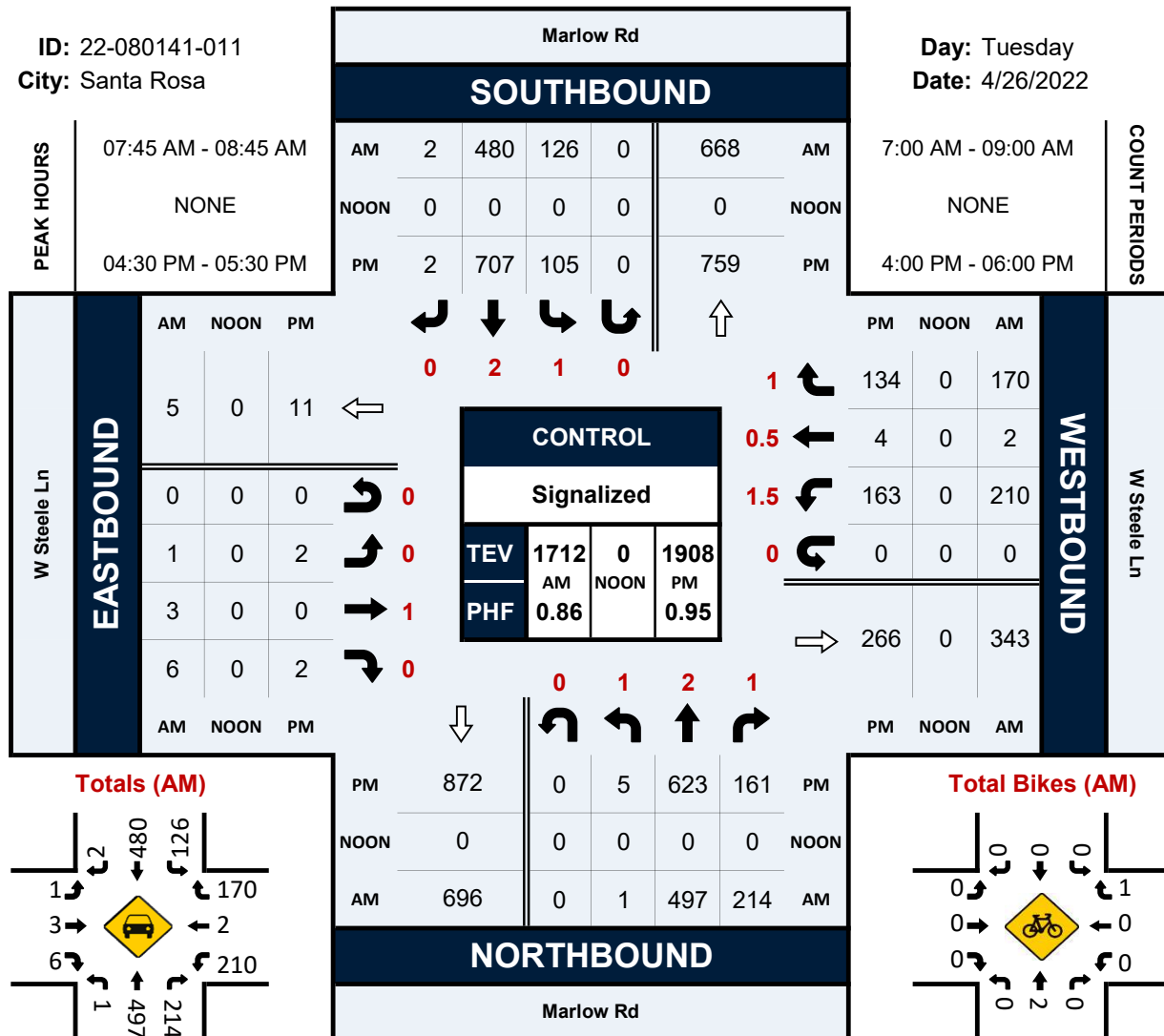


Marlow Rd & W Steele Ln

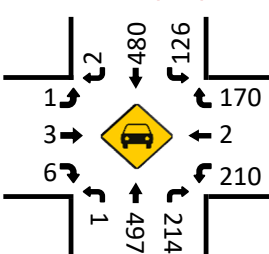
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City: Santa Rosa

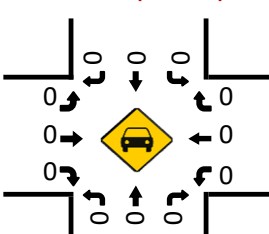
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Date: 4/26/2022



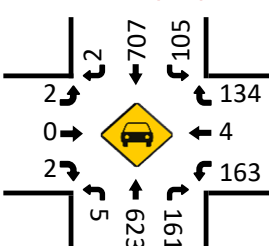
Totals (AM)



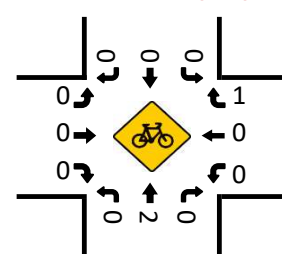
Totals (NOON)



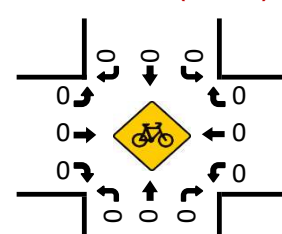
Totals (PM)



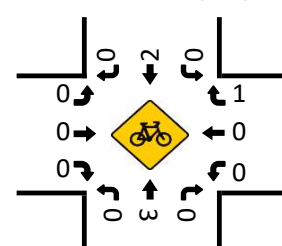
Total Bikes (AM)



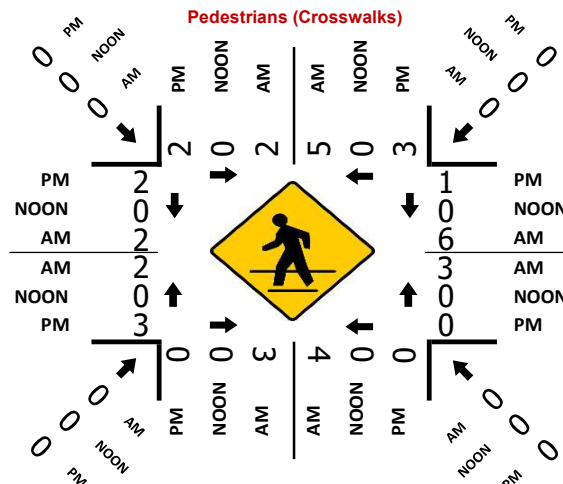
Total Bikes (NOON)



Total Bikes (PM)



Pedestrians (Crosswalks)

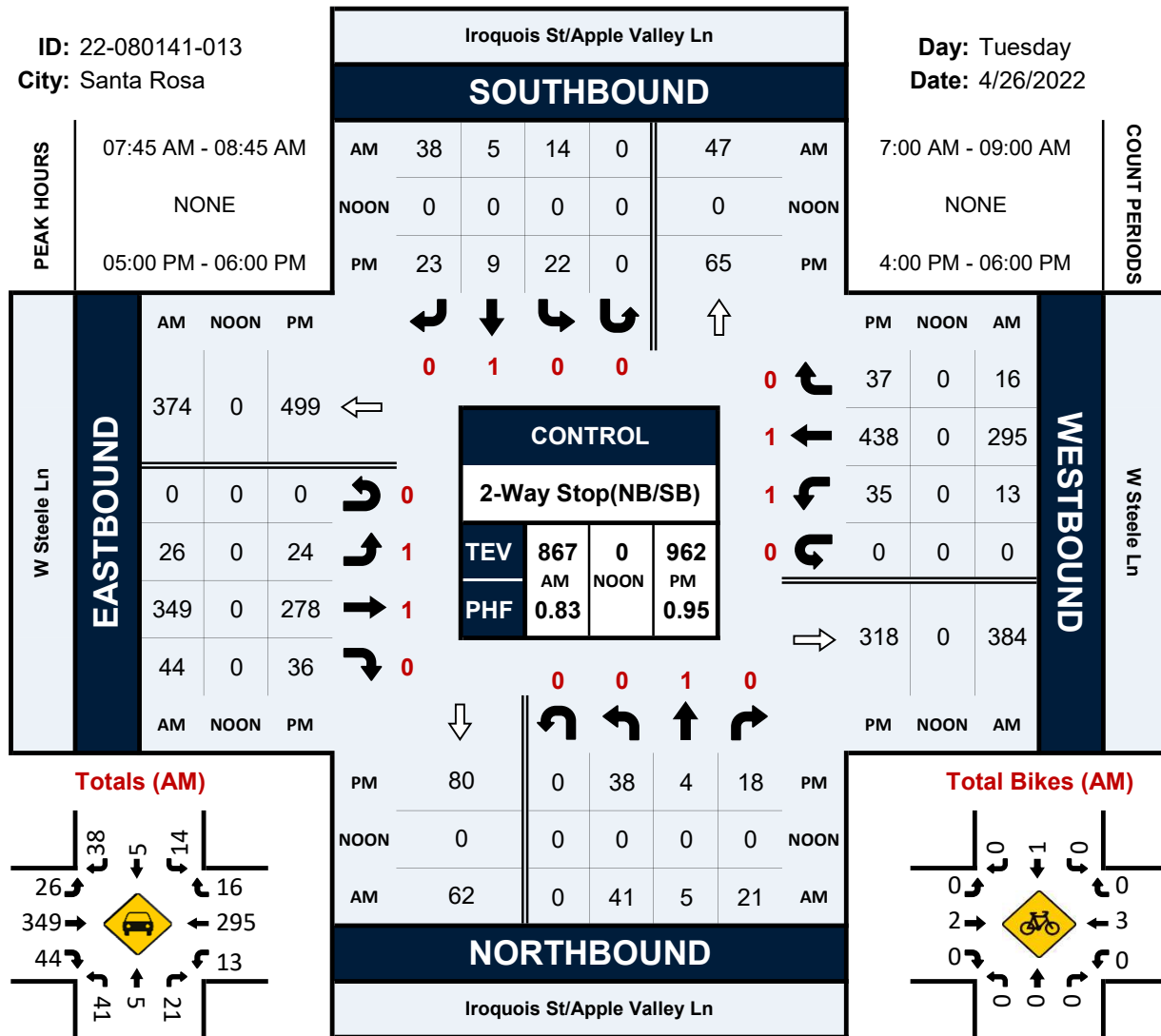


Iroquois St/Apple Valley Ln & W Steele Ln

Peak Hour Turning Movement Count

ID: 22-080141-013
City: Santa Rosa

Day: Tuesday
Date: 4/26/2022



Dutton Ave & W College Ave

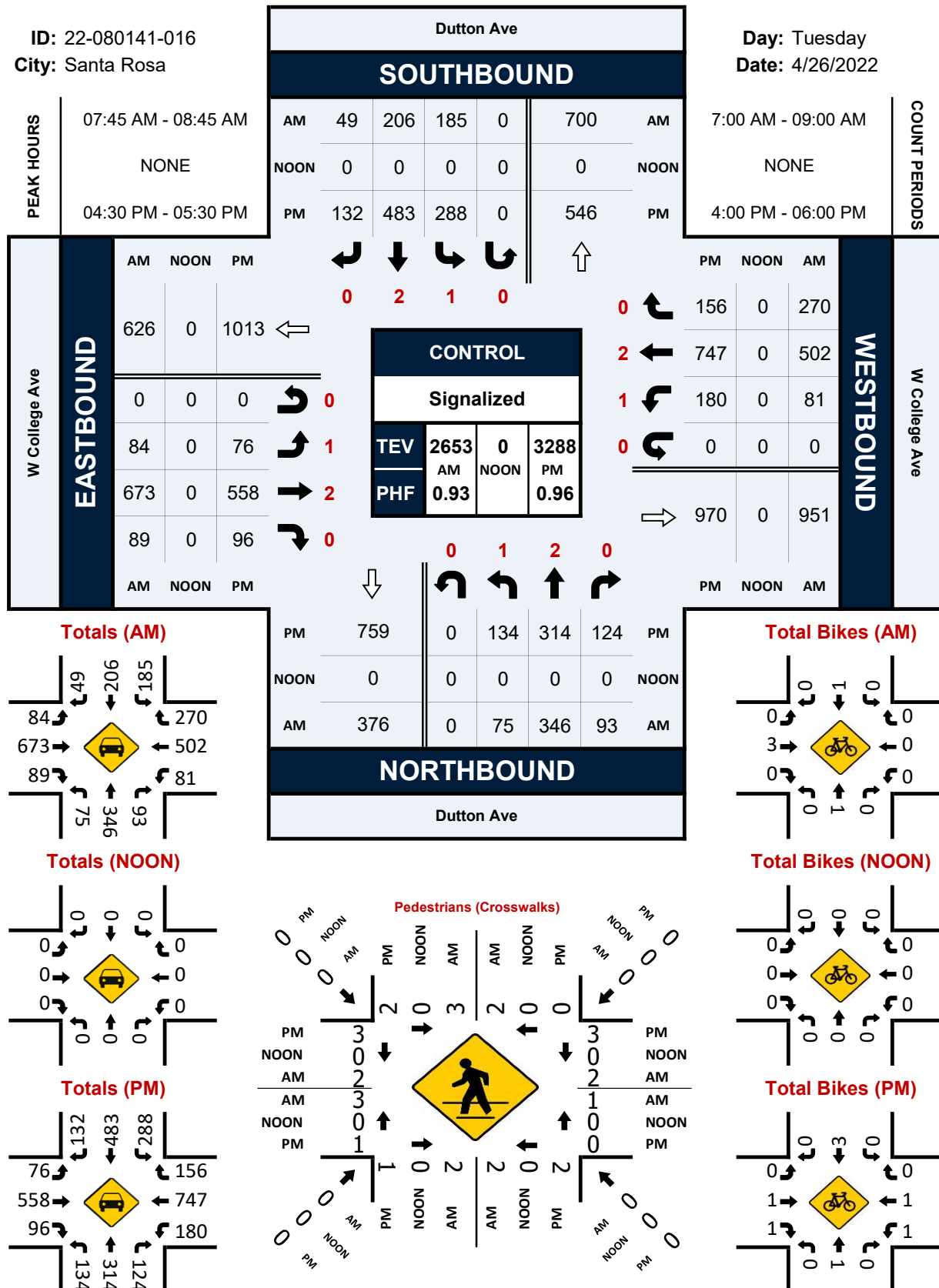
Peak Hour Turning Movement Count

ID: 22-080141-016

City: Santa Rosa

Day: Tuesday

Date: 4/26/2022

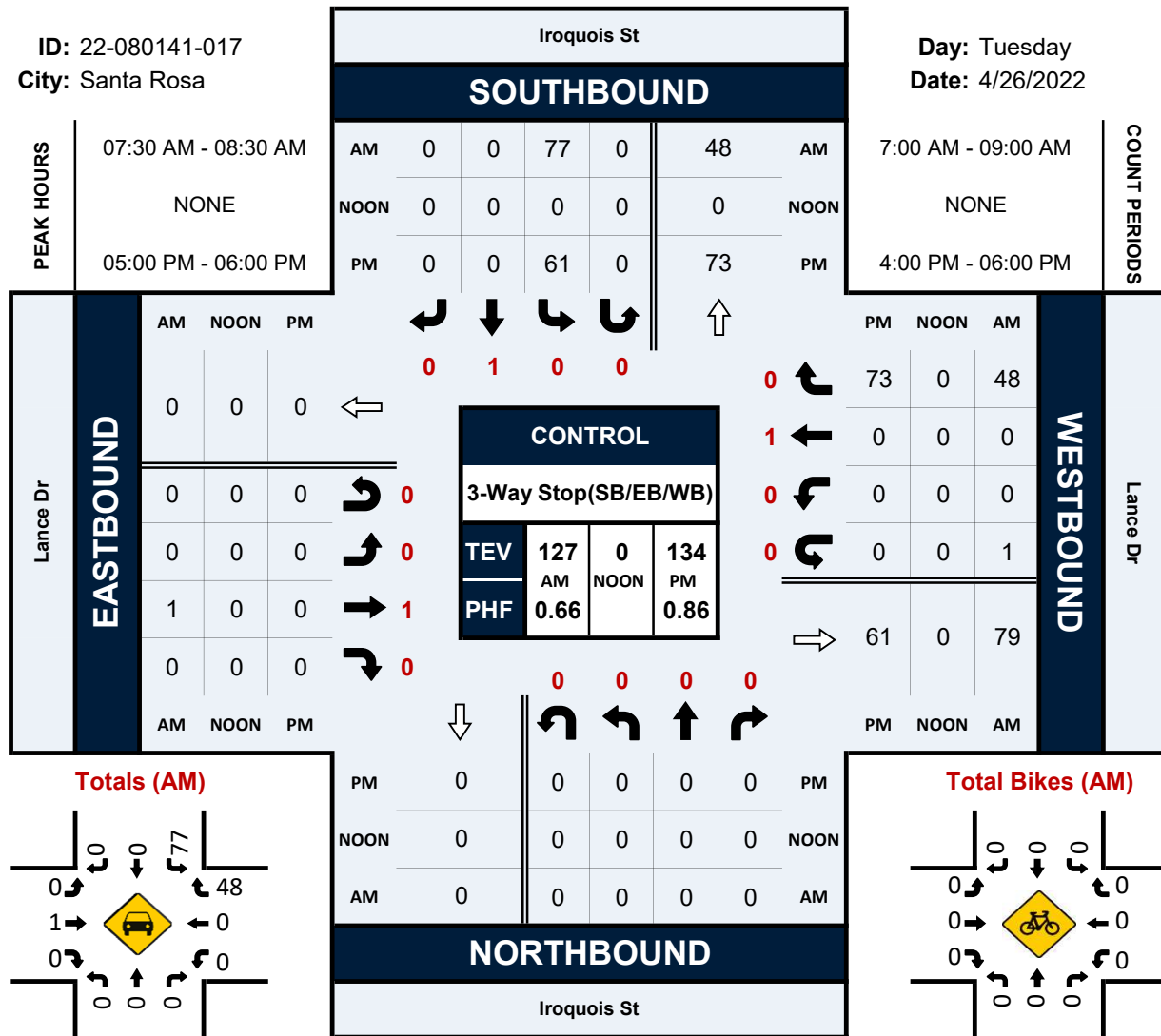


Iroquois St & Lance Dr

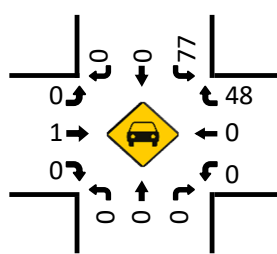
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ID: 22-080141-017
City: Santa Rosa

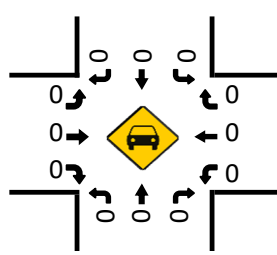
Day: Tuesday
Date: 4/26/2022



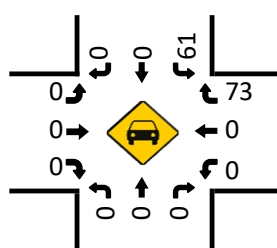
Totals (AM)



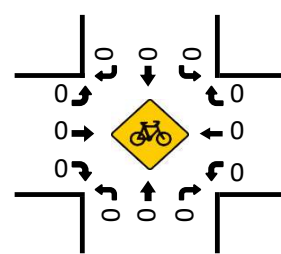
Totals (NOON)



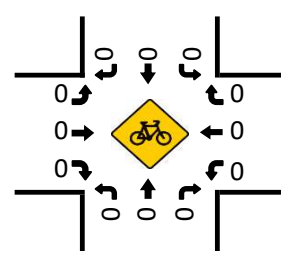
Totals (PM)



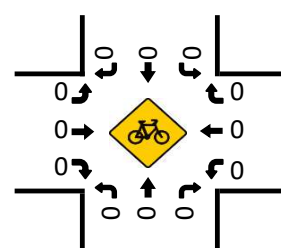
Total Bikes (AM)



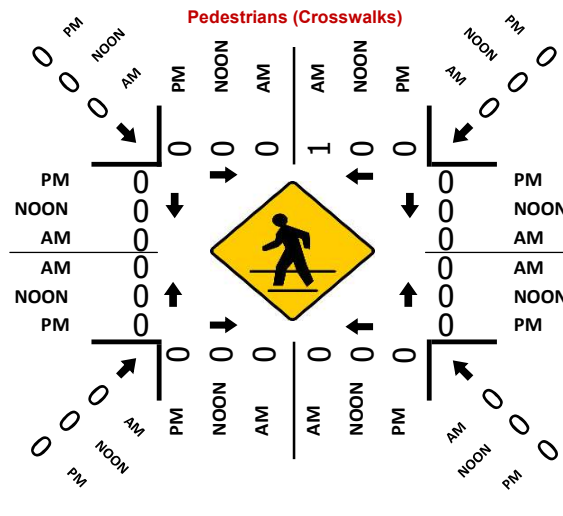
Total Bikes (NOON)



Total Bikes (PM)



Pedestrians (Crosswalks)

























APPENDIX B: INTERSECTION LOS WORKSHEETS

HCM 6th Signalized Intersection Summary







1: Marlow Rd & Marlow Ct/W Steele Ln

Lance Drive Residential TIA
Existing AM (95-120 Seconds)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	3	6	210	2	170	1	497	214	126	480	2
Future Volume (veh/h)	1	3	6	210	2	170	1	497	214	126	480	2
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.96	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	1	3	0	245	0	121	1	578	166	147	558	2
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	10	31	0	1735	0	909	2	793	1110	157	1116	4
Arrive On Green	0.02	0.02	0.00	0.49	0.00	0.49	0.00	0.22	0.22	0.09	0.31	0.31
Sat Flow, veh/h	458	1374	0	3534	0	1566	1767	3526	1505	1767	3603	13
Grp Volume(v), veh/h	4	0	0	245	0	121	1	578	166	147	273	287
Grp Sat Flow(s),veh/h/ln	1833	0	0	1767	0	1566	1767	1763	1505	1767	1763	1853
Q Serve(g_s), s	0.2	0.0	0.0	4.2	0.0	0.0	0.1	16.7	3.9	9.1	13.9	13.9
Cycle Q Clear(g_c), s	0.2	0.0	0.0	4.2	0.0	0.0	0.1	16.7	3.9	9.1	13.9	13.9
Prop In Lane	0.25		0.00	1.00		1.00	1.00		1.00	1.00		0.01
Lane Grp Cap(c), veh/h	41	0	0	1735	0	909	2	793	1110	157	546	574
V/C Ratio(X)	0.10	0.00	0.00	0.14	0.00	0.13	0.41	0.73	0.15	0.93	0.50	0.50
Avail Cap(c_a), veh/h	317	0	0	1735	0	909	80	1026	1210	157	585	615
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.64	0.64	0.64	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.7	0.0	0.0	15.3	0.0	10.5	54.9	39.5	5.0	49.8	31.0	31.0
Incr Delay (d2), s/veh	1.0	0.0	0.0	0.2	0.0	0.3	59.3	1.2	0.0	52.4	0.7	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.0	1.7	0.0	1.4	0.1	7.2	3.8	6.3	5.9	6.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	53.7	0.0	0.0	15.5	0.0	10.8	114.2	40.8	5.0	102.1	31.7	31.7
LnGrp LOS	D	A	A	B	A	B	F	D	A	F	C	C
Approach Vol, veh/h	4			366			745			707		
Approach Delay, s/veh	53.7			13.9			32.9			46.3		
Approach LOS	D			B			C			D		
Timer - Assigned Phs	2		3	4		6		7	8			
Phs Duration (G+Y+Rc), s	58.6		5.1	39.0		7.4		14.7	29.3			
Change Period (Y+Rc), s	4.6		4.9	4.9		4.9		4.9	4.6			
Max Green Setting (Gmax), s	30.2		5.0	36.5		19.0		9.8	32.0			
Max Q Clear Time (g_c+I1), s	6.2		2.1	15.9		2.2		11.1	18.7			
Green Ext Time (p_c), s	1.3		0.0	3.2		0.0		0.0	3.7			
Intersection Summary												
HCM 6th Ctrl Delay	34.4											
HCM 6th LOS	C											
Notes												
User approved pedestrian interval to be less than phase max green.												
User approved volume balancing among the lanes for turning movement.												






















HCM 6th TWSC
2: Iroquois St/Apple Valley Ln & W Steele Ln

Lance Drive Residential TIA
Existing AM (95-120 Seconds)

Intersection												
Int Delay, s/veh	3.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	26	349	44	13	295	16	41	5	21	14	5	38
Future Vol, veh/h	26	349	44	13	295	16	41	5	21	14	5	38
Conflicting Peds, #/hr	12	0	24	24	0	12	4	0	4	4	0	4
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	60	-	-	80	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	31	420	53	16	355	19	49	6	25	17	6	46
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	386	0	0	497	0	0	960	951	475	937	968	381
Stage 1	-	-	-	-	-	-	533	533	-	409	409	-
Stage 2	-	-	-	-	-	-	427	418	-	528	559	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1167	-	-	1062	-	-	235	259	588	244	253	664
Stage 1	-	-	-	-	-	-	529	523	-	617	594	-
Stage 2	-	-	-	-	-	-	604	589	-	532	509	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1154	-	-	1038	-	-	202	240	572	218	234	654
Mov Cap-2 Maneuver	-	-	-	-	-	-	202	240	-	218	234	-
Stage 1	-	-	-	-	-	-	503	497	-	594	579	-
Stage 2	-	-	-	-	-	-	545	574	-	487	484	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.5			0.3			25.3			16		
HCM LOS							D			C		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	257	1154	-	-	1038	-	-	397				
HCM Lane V/C Ratio	0.314	0.027	-	-	0.015	-	-	0.173				
HCM Control Delay (s)	25.3	8.2	-	-	8.5	-	-	16				
HCM Lane LOS	D	A	-	-	A	-	-	C				
HCM 95th %tile Q(veh)	1.3	0.1	-	-	0	-	-	0.6				

HCM 6th Signalized Intersection Summary 3: Range Ave & W Steele Ln

Lance Drive Residential TIA
Existing AM (95-120 Seconds)











												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	405	44	44	265	38	37	170	25	26	142	29
Future Volume (veh/h)	40	405	44	44	265	38	37	170	25	26	142	29
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.95	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	45	460	45	50	301	38	42	193	16	30	161	11
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	753	1199	117	620	1162	147	62	428	35	51	445	30
Arrive On Green	0.72	0.72	0.72	0.72	0.72	0.72	0.04	0.13	0.13	0.03	0.13	0.13
Sat Flow, veh/h	1031	1663	163	886	1611	203	1767	3285	269	1767	3337	226
Grp Volume(v), veh/h	45	0	505	50	0	339	42	103	106	30	84	88
Grp Sat Flow(s),veh/h/ln	1031	0	1825	886	0	1815	1767	1763	1791	1767	1763	1800
Q Serve(g_s), s	1.5	0.0	10.1	2.2	0.0	6.1	2.2	5.1	5.2	1.6	4.1	4.2
Cycle Q Clear(g_c), s	7.6	0.0	10.1	12.3	0.0	6.1	2.2	5.1	5.2	1.6	4.1	4.2
Prop In Lane	1.00		0.09	1.00		0.11	1.00		0.15	1.00		0.13
Lane Grp Cap(c), veh/h	753	0	1316	620	0	1308	62	230	234	51	235	240
V/C Ratio(X)	0.06	0.00	0.38	0.08	0.00	0.26	0.67	0.45	0.46	0.59	0.36	0.37
Avail Cap(c_a), veh/h	753	0	1316	620	0	1308	149	466	473	149	466	476
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.79	0.79	0.79	1.00	1.00	1.00
Uniform Delay (d), s/veh	5.9	0.0	5.1	7.5	0.0	4.6	45.3	38.1	38.2	45.6	37.5	37.5
Incr Delay (d2), s/veh	0.2	0.0	0.8	0.3	0.0	0.5	3.7	0.4	0.4	4.0	0.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	3.3	0.4	0.0	2.0	1.0	2.2	2.2	0.7	1.7	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	6.0	0.0	6.0	7.8	0.0	5.0	49.0	38.5	38.6	49.6	37.8	37.8
LnGrp LOS	A	A	A	A	A	A	D	D	D	D	D	D
Approach Vol, veh/h		550			389			251			202	
Approach Delay, s/veh		6.0			5.4			40.3			39.6	
Approach LOS		A			A			D			D	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		72.1	6.3	16.6		72.1	6.6	16.3				
Change Period (Y+Rc), s		3.6	3.0	3.9		3.6	3.9	* 3.9				
Max Green Setting (Gmax), s		51.4	8.0	25.1		51.4	8.0	* 25				
Max Q Clear Time (g_c+I1), s		12.1	4.2	6.2		14.3	3.6	7.2				
Green Ext Time (p_c), s		1.1	0.0	0.2		0.8	0.0	0.3				
Intersection Summary												
HCM 6th Ctrl Delay			16.9									
HCM 6th LOS			B									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

HCM 6th Signalized Intersection Summary

4: Marlow Rd & Guerneville Rd

Lance Drive Residential TIA
Existing AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	109	437	141	138	262	89	124	463	162	110	484	80
Future Volume (veh/h)	109	437	141	138	262	89	124	463	162	110	484	80
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No				No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	118	475	108	150	285	67	135	503	62	120	526	74
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	147	668	432	169	585	135	154	674	445	213	695	97
Arrive On Green	0.08	0.19	0.19	0.10	0.21	0.21	0.09	0.19	0.19	0.12	0.22	0.22
Sat Flow, veh/h	1767	3526	1558	1767	2838	656	1767	3526	1540	1767	3096	434
Grp Volume(v), veh/h	118	475	108	150	175	177	135	503	62	120	299	301
Grp Sat Flow(s),veh/h/ln	1767	1763	1558	1767	1763	1731	1767	1763	1540	1767	1763	1767
Q Serve(g_s), s	6.2	12.0	2.0	8.0	8.3	8.6	7.2	12.8	0.0	6.1	15.0	15.2
Cycle Q Clear(g_c), s	6.2	12.0	2.0	8.0	8.3	8.6	7.2	12.8	0.0	6.1	15.0	15.2
Prop In Lane	1.00		1.00	1.00		0.38	1.00		1.00	1.00		0.25
Lane Grp Cap(c), veh/h	147	668	432	169	364	357	154	674	445	213	396	396
V/C Ratio(X)	0.80	0.71	0.25	0.89	0.48	0.50	0.87	0.75	0.14	0.56	0.75	0.76
Avail Cap(c_a), veh/h	177	965	564	169	475	466	154	1065	616	213	557	558
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.99	0.99	0.99	0.62	0.62	0.62	0.91	0.91	0.91
Uniform Delay (d), s/veh	42.8	36.1	5.2	42.4	33.2	33.3	42.8	36.3	25.1	39.4	34.4	34.5
Incr Delay (d2), s/veh	19.6	1.4	0.3	38.4	4.5	4.8	27.3	1.0	0.1	3.1	3.4	3.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	5.1	1.3	5.2	3.9	3.9	4.2	5.4	1.0	2.8	6.6	6.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	62.4	37.5	5.5	80.9	37.7	38.1	70.1	37.3	25.2	42.5	37.8	38.0
LnGrp LOS	E	D	A	F	D	D	E	D	C	D	D	D
Approach Vol, veh/h	701		502				700			720		
Approach Delay, s/veh	36.8		50.7				42.6			38.7		
Approach LOS	D		D				D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	4.8	23.7	13.6	26.6	13.2	25.3	16.8	23.4				
Change Period (Y+Rc), s	5.7	* 5.7	5.3	5.3	5.3	5.7	5.3	5.3				
Max Green Setting (Gmax), s	26	* 26	8.3	30.0	9.5	25.6	9.6	28.7				
Max Q Clear Time (g_c+I10), s	14.0	14.0	9.2	17.2	8.2	10.6	8.1	14.8				
Green Ext Time (p_c), s	0.0	2.6	0.0	2.9	0.0	1.6	0.0	2.8				

Intersection Summary

HCM 6th Ctrl Delay 41.5

HCM 6th LOS D

Notes







User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary 5: Ridley Ave & Guerneville Rd

Lance Drive Residential TIA
Existing AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	673	25	56	429	11	36	4	56	15	4	15
Future Volume (veh/h)	20	673	25	56	429	11	36	4	56	15	4	15
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	0.98		0.96	0.98		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	22	756	21	63	482	8	40	4	6	17	4	2
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	822	2913	81	617	2953	49	172	19	17	165	36	13
Arrive On Green	0.83	0.83	0.83	1.00	1.00	1.00	0.10	0.10	0.10	0.10	0.10	0.10
Sat Flow, veh/h	897	3501	97	688	3549	59	1089	197	175	1043	375	135
Grp Volume(v), veh/h	22	381	396	63	239	251	50	0	0	23	0	0
Grp Sat Flow(s),veh/h/ln	897	1763	1835	688	1763	1845	1460	0	0	1552	0	0
Q Serve(g_s), s	0.4	4.4	4.4	0.5	0.0	0.0	1.7	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.4	4.4	4.4	4.9	0.0	0.0	2.9	0.0	0.0	1.1	0.0	0.0
Prop In Lane	1.00		0.05	1.00		0.03	0.80		0.12	0.74		0.09
Lane Grp Cap(c), veh/h	822	1467	1527	617	1467	1535	207	0	0	214	0	0
V/C Ratio(X)	0.03	0.26	0.26	0.10	0.16	0.16	0.24	0.00	0.00	0.11	0.00	0.00
Avail Cap(c_a), veh/h	822	1467	1527	617	1467	1535	579	0	0	594	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.92	0.92	0.92	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	1.4	1.7	1.7	0.1	0.0	0.0	40.1	0.0	0.0	39.4	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.4	0.4	0.0	0.0	0.0	0.2	0.0	0.0	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.7	0.7	0.0	0.0	0.0	1.1	0.0	0.0	0.5	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	1.4	2.1	2.1	0.2	0.0	0.0	40.3	0.0	0.0	39.5	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	D	A	A	D	A	A
Approach Vol, veh/h	799				553				50			
Approach Delay, s/veh	2.1				0.0				40.3			
Approach LOS	A				A				D			
Timer - Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	82.9		12.1		82.9		12.1					
Change Period (Y+Rc), s	3.9		3.0		3.9		3.0					
Max Green Setting (Gmax), s	54.1		34.0		54.1		34.0					
Max Q Clear Time (g_c+I1), s	6.4		3.1		6.9		4.9					
Green Ext Time (p_c), s	1.5		0.0		1.1		0.1					
Intersection Summary												
HCM 6th Ctrl Delay			3.2									
HCM 6th LOS			A									

HCM 6th Signalized Intersection Summary

6: Lance Dr & Guerneville Rd

Lance Drive Residential TIA
Existing AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	702	24	22	426	42	12	43	60	55	77	58
Future Volume (veh/h)	21	702	24	22	426	42	12	43	60	55	77	58
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.99	0.99		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	25	836	27	26	507	24	14	51	47	65	92	59
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	54	926	30	65	959	418	60	149	121	117	132	75
Arrive On Green	0.01	0.09	0.09	0.01	0.09	0.09	0.17	0.17	0.17	0.17	0.17	0.17
Sat Flow, veh/h	1767	3482	112	1767	3526	1536	107	893	723	402	792	449
Grp Volume(v), veh/h	25	423	440	26	507	24	112	0	0	216	0	0
Grp Sat Flow(s), veh/h/ln	1767	1763	1832	1767	1763	1536	1722	0	0	1643	0	0
Q Serve(g_s), s	1.3	22.6	22.6	1.4	13.1	1.4	0.0	0.0	0.0	6.2	0.0	0.0
Cycle Q Clear(g_c), s	1.3	22.6	22.6	1.4	13.1	1.4	5.5	0.0	0.0	11.7	0.0	0.0
Prop In Lane	1.00		0.06	1.00		1.00	0.12		0.42	0.30		0.27
Lane Grp Cap(c), veh/h	54	469	487	65	959	418	331	0	0	324	0	0
V/C Ratio(X)	0.46	0.90	0.90	0.40	0.53	0.06	0.34	0.00	0.00	0.67	0.00	0.00
Avail Cap(c_a), veh/h	125	737	766	143	1510	658	612	0	0	596	0	0
HCM Platoon Ratio	0.33	0.33	0.33	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.98	0.98	0.98	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	46.2	42.1	42.1	45.9	37.4	32.1	35.2	0.0	0.0	37.6	0.0	0.0
Incr Delay (d2), s/veh	2.3	6.7	6.5	1.5	2.0	0.3	0.2	0.0	0.0	0.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	11.4	11.9	0.6	6.4	0.5	2.3	0.0	0.0	4.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.5	48.8	48.6	47.4	39.5	32.3	35.5	0.0	0.0	38.5	0.0	0.0
LnGrp LOS	D	D	D	D	D	C	D	A	A	D	A	A
Approach Vol, veh/h	888			557			112			216		
Approach Delay, s/veh	48.7			39.5			35.5			38.5		
Approach LOS	D			D			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8	30.6		20.5	8.2	31.2		20.5				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		4.6				
Max Green Setting (Gmax), s	39.7	39.7		32.4	6.7	40.7		32.4				
Max Q Clear Time (g_c+13.4)	24.6	24.6		13.7	3.3	15.1		7.5				
Green Ext Time (p_c), s	0.0	0.7		0.3	0.0	0.6		0.1				

Intersection Summary

HCM 6th Ctrl Delay 43.7

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

7: N Dutton Ave/Westberry Dr & Guerneville Rd

Lance Drive Residential TIA
Existing AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	811	100	234	442	7	79	2	363	20	3	6
Future Volume (veh/h)	3	811	100	234	442	7	79	2	363	20	3	6
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	4	977	115	282	533	7	96	0	106	24	4	0
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	11	1030	121	1252	2435	32	185	0	656	64	11	0
Arrive On Green	0.01	0.32	0.32	0.37	0.68	0.68	0.05	0.00	0.05	0.04	0.04	0.00
Sat Flow, veh/h	1767	3170	373	3428	3562	47	3534	0	1564	1525	254	0
Grp Volume(v), veh/h	4	543	549	282	264	276	96	0	106	28	0	0
Grp Sat Flow(s), veh/h/ln	1767	1763	1780	1714	1763	1846	1767	0	1564	1779	0	0
Q Serve(g_s), s	0.2	28.6	28.6	5.4	5.3	5.3	2.5	0.0	0.0	1.5	0.0	0.0
Cycle Q Clear(g_c), s	0.2	28.6	28.6	5.4	5.3	5.3	2.5	0.0	0.0	1.5	0.0	0.0
Prop In Lane	1.00		0.21	1.00		0.03	1.00		1.00	0.86		0.00
Lane Grp Cap(c), veh/h	11	573	578	1252	1205	1262	185	0	656	74	0	0
V/C Ratio(X)	0.36	0.95	0.95	0.23	0.22	0.22	0.52	0.00	0.16	0.38	0.00	0.00
Avail Cap(c_a), veh/h	112	590	596	1252	1205	1262	190	0	658	519	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.94	0.94	0.94	0.95	0.95	0.95	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	47.0	31.3	31.3	20.9	5.6	5.6	43.8	0.0	17.3	44.3	0.0	0.0
Incr Delay (d2), s/veh	6.6	25.8	25.7	0.0	0.4	0.4	0.9	0.0	0.0	1.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	15.5	15.6	2.1	1.7	1.8	1.1	0.0	1.4	0.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	53.6	57.1	57.1	20.9	6.0	6.0	44.8	0.0	17.3	45.5	0.0	0.0
LnGrp LOS	D	E	E	C	A	A	D	A	B	D	A	A
Approach Vol, veh/h	1096			822			202			28		
Approach Delay, s/veh	57.1			11.1			30.4			45.5		
Approach LOS	E			B			C			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	40.0	36.2		8.6	5.9	70.3		10.3				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		5.3				
Max Green Setting (Gmax), s	31.8	31.8		27.7	6.0	35.7		5.1				
Max Q Clear Time (g_c+11), s	30.6	30.6		3.5	2.2	7.3		4.5				
Green Ext Time (p_c), s	0.0	0.3		0.0	0.0	0.4		0.0				

Intersection Summary

HCM 6th Ctrl Delay 36.8

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

8: Herbert St/Coffey Ln & Guerneville Rd

Lance Drive Residential TIA
Existing AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	123	1040	29	17	516	36	20	12	15	75	5	148
Future Volume (veh/h)	123	1040	29	17	516	36	20	12	15	75	5	148
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		0.96	1.00		0.93	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	143	1209	33	20	600	39	23	14	1	87	6	39
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	170	1178	32	606	1954	127	64	39	3	144	10	282
Arrive On Green	0.10	0.34	0.34	0.34	0.58	0.58	0.06	0.06	0.06	0.09	0.09	0.09
Sat Flow, veh/h	1767	3500	95	1767	3350	217	1083	659	47	1658	114	1507
Grp Volume(v), veh/h	143	609	633	20	315	324	38	0	0	93	0	39
Grp Sat Flow(s), veh/h/ln	1767	1763	1832	1767	1763	1805	1789	0	0	1773	0	1507
Q Serve(g_s), s	9.2	38.7	38.7	0.9	10.4	10.5	2.3	0.0	0.0	5.8	0.0	2.5
Cycle Q Clear(g_c), s	9.2	38.7	38.7	0.9	10.4	10.5	2.3	0.0	0.0	5.8	0.0	2.5
Prop In Lane	1.00		0.05	1.00		0.12	0.61		0.03	0.94		1.00
Lane Grp Cap(c), veh/h	170	593	617	606	1028	1053	105	0	0	154	0	282
V/C Ratio(X)	0.84	1.03	1.03	0.03	0.31	0.31	0.36	0.00	0.00	0.60	0.00	0.14
Avail Cap(c_a), veh/h	272	593	617	606	1028	1053	389	0	0	402	0	493
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.78	0.78	0.78	0.95	0.95	0.95	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	51.1	38.1	38.2	25.1	12.2	12.2	52.0	0.0	0.0	50.6	0.0	39.4
Incr Delay (d2), s/veh	5.2	39.5	39.1	0.0	0.7	0.7	0.8	0.0	0.0	1.4	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.2	22.5	23.3	0.4	4.0	4.1	1.1	0.0	0.0	2.6	0.0	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	56.3	77.6	77.3	25.1	12.9	12.9	52.8	0.0	0.0	52.0	0.0	39.5
LnGrp LOS	E	F	F	C	B	B	D	A	A	D	A	D
Approach Vol, veh/h	1385			659			38			132		
Approach Delay, s/veh	75.2			13.3			52.8			48.3		
Approach LOS	E			B			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	44.7	44.0		14.9	16.4	72.4		11.4				
Change Period (Y+Rc), s	5.3	5.3		4.9	5.3	5.3		4.6				
Max Green Setting (Gmax), s	5.3	38.7		26.1	17.7	26.1		25.0				
Max Q Clear Time (g_c+12, s)	40.7			7.8	11.2	12.5		4.3				
Green Ext Time (p_c), s	0.0	0.0		0.1	0.0	0.5		0.0				
Intersection Summary												
HCM 6th Ctrl Delay	54.8											
HCM 6th LOS	D											

HCM 6th Signalized Intersection Summary

9: Range Ave & Guerneville Rd

Lance Drive Residential TIA
Existing AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	141	674	143	69	391	5	128	86	72	27	98	102
Future Volume (veh/h)	141	674	143	69	391	5	128	86	72	27	98	102
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.96	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No		No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	150	717	0	73	416	0	78	172	8	29	104	9
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	224	829		95	573		167	332	15	127	236	20
Arrive On Green	0.13	0.24	0.00	0.05	0.16	0.00	0.09	0.09	0.09	0.07	0.07	0.07
Sat Flow, veh/h	1767	3618	0	1767	3618	0	1767	3512	162	1767	3274	279
Grp Volume(v), veh/h	150	717	0	73	416	0	78	90	90	29	55	58
Grp Sat Flow(s), veh/h/ln	1767	1763	0	1767	1763	0	1767	1856	1819	1767	1763	1791
Q Serve(g_s), s	7.7	18.6	0.0	3.9	10.6	0.0	4.0	4.4	4.5	1.5	2.9	2.9
Cycle Q Clear(g_c), s	7.7	18.6	0.0	3.9	10.6	0.0	4.0	4.4	4.5	1.5	2.9	2.9
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.09	1.00		0.16
Lane Grp Cap(c), veh/h	224	829		95	573		167	175	172	127	127	129
V/C Ratio(X)	0.67	0.87		0.77	0.73		0.47	0.52	0.52	0.23	0.44	0.45
Avail Cap(c_a), veh/h	224	1058		112	1058		614	645	632	130	130	132
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.83	0.83	0.00	0.98	0.98	0.00	1.00	1.00	1.00	0.87	0.87	0.87
Uniform Delay (d), s/veh	39.6	34.9	0.0	44.3	37.8	0.0	40.7	40.9	41.0	41.6	42.2	42.3
Incr Delay (d2), s/veh	5.2	4.4	0.0	18.7	7.7	0.0	0.8	0.9	0.9	0.3	0.8	0.8
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	8.1	0.0	2.2	5.1	0.0	1.7	2.0	2.0	0.6	1.2	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	44.8	39.3	0.0	63.0	45.5	0.0	41.5	41.8	41.9	41.9	43.0	43.1
LnGrp LOS	D	D		E	D		D	D	D	D	D	D
Approach Vol, veh/h	867		A		489		A		258		142	
Approach Delay, s/veh	40.2				48.1				41.7		42.8	
Approach LOS	D				D				D		D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	27.6			12.1	17.3	20.7		13.6				
Change Period (Y+Rc), s	5.3	5.3		5.3	5.3	5.3		4.6				
Max Green Setting (Gmax), s	28.5			7.0	6.0	28.5		33.0				
Max Q Clear Time (g_c+15), s	20.6			4.9	9.7	12.6		6.5				
Green Ext Time (p_c), s	0.0	0.7		0.0	0.0	0.5		0.1				

Intersection Summary

HCM 6th Ctrl Delay 42.8

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

10: Guerneville Rd & Steele Wy

Lance Drive Residential TIA
Existing AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	708	40	51	433	5	23	10	53	381	16	9
Future Volume (veh/h)	25	708	40	51	433	5	23	10	53	381	16	9
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	28	805	25	58	492	5	18	21	5	446	0	4
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	821	1983	967	218	576	6	94	99	183	514	0	959
Arrive On Green	0.46	0.56	0.56	0.06	0.16	0.16	0.05	0.05	0.05	0.15	0.00	0.15
Sat Flow, veh/h	1767	3526	1571	3428	3574	36	1767	1856	1558	3534	0	1566
Grp Volume(v), veh/h	28	805	25	58	243	254	18	21	5	446	0	4
Grp Sat Flow(s), veh/h/ln	1767	1763	1571	1714	1763	1848	1767	1856	1558	1767	0	1566
Q Serve(g_s), s	0.9	14.2	0.7	1.8	14.7	14.7	1.1	1.2	0.3	13.6	0.0	0.0
Cycle Q Clear(g_c), s	0.9	14.2	0.7	1.8	14.7	14.7	1.1	1.2	0.3	13.6	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.02	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	821	1983	967	218	284	298	94	99	183	514	0	959
V/C Ratio(X)	0.03	0.41	0.03	0.27	0.85	0.85	0.19	0.21	0.03	0.87	0.00	0.00
Avail Cap(c_a), veh/h	821	1983	967	218	476	499	434	455	482	868	0	1115
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.90	0.90	0.90	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	16.0	13.7	8.3	49.1	44.9	44.9	49.8	49.9	43.0	46.0	0.0	8.4
Incr Delay (d2), s/veh	0.0	0.6	0.0	0.2	3.4	3.3	0.4	0.4	0.0	2.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	5.5	0.3	0.8	6.6	6.9	0.5	0.6	0.1	6.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.0	14.2	8.3	49.3	48.3	48.2	50.2	50.3	43.1	48.3	0.0	8.4
LnGrp LOS	B	B	A	D	D	D	D	D	D	D	A	A
Approach Vol, veh/h	858			555			44			450		
Approach Delay, s/veh	14.1			48.3			49.4			48.0		
Approach LOS	B			D			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	1.9	66.8		20.9	56.0	22.6		10.4				
Change Period (Y+Rc), s	4.9	4.9		4.9	4.9	4.9		4.6				
Max Green Setting (Gmax), s	7.0	29.7		27.0	7.0	29.7		27.0				
Max Q Clear Time (g_c+13.5), s	16.2	16.2		15.6	2.9	16.7		3.2				
Green Ext Time (p_c), s	0.0	1.0		0.1	0.0	0.4		0.0				

Intersection Summary

HCM 6th Ctrl Delay 32.9

HCM 6th LOS C

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

11: Cleveland Ave & Guerneville Rd

Lance Drive Residential TIA
Existing AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	RT	LT	RT	RT	LT	RT	RT	LT	RT	RT	LT	RT
Traffic Volume (veh/h)	52	1092	32	172	796	184	28	87	141	223	63	34
Future Volume (veh/h)	52	1092	32	172	796	184	28	87	141	223	63	34
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	57	1200	32	189	875	118	31	96	48	245	69	25
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	216	1326	35	257	964	420	624	818	383	368	134	49
Arrive On Green	0.06	0.26	0.26	0.05	0.18	0.18	0.35	0.35	0.35	0.10	0.10	0.10
Sat Flow, veh/h	3428	5070	135	3428	3526	1535	1767	2317	1083	3534	1293	468
Grp Volume(v), veh/h	57	799	433	189	875	118	31	71	73	245	0	94
Grp Sat Flow(s), veh/h/ln	1714	1689	1828	1714	1763	1535	1767	1763	1638	1767	0	1761
Q Serve(g_s), s	1.5	21.8	21.8	5.2	23.1	6.3	1.1	2.6	2.8	6.3	0.0	4.8
Cycle Q Clear(g_c), s	1.5	21.8	21.8	5.2	23.1	6.3	1.1	2.6	2.8	6.3	0.0	4.8
Prop In Lane	1.00		0.07	1.00		1.00	1.00		0.66	1.00		0.27
Lane Grp Cap(c), veh/h	216	883	478	257	964	420	624	623	578	368	0	183
V/C Ratio(X)	0.26	0.91	0.91	0.74	0.91	0.28	0.05	0.11	0.13	0.67	0.00	0.51
Avail Cap(c_a), veh/h	253	1034	560	328	1158	504	624	623	578	1008	0	502
HCM Platoon Ratio	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.77	0.77	0.77	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	42.4	33.9	33.9	44.2	37.6	30.8	20.2	20.7	20.8	41.0	0.0	40.3
Incr Delay (d2), s/veh	0.2	9.3	15.4	3.2	6.7	0.1	0.2	0.4	0.4	0.8	0.0	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	9.7	11.3	2.3	11.1	2.3	0.5	1.1	1.1	2.7	0.0	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.6	43.2	49.4	47.4	44.3	30.9	20.4	21.1	21.2	41.8	0.0	41.1
LnGrp LOS	D	D	D	D	D	C	C	C	C	D	A	D
Approach Vol, veh/h	1289			1182			175			339		
Approach Delay, s/veh	45.3			43.5			21.0			41.6		
Approach LOS	D			D			C			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	29.7			38.5	10.9	30.9		14.8				
Change Period (Y+Rc), s	4.9	4.9		4.9	4.9	4.9		4.9				
Max Green Setting (Gmax), s	29.1			10.1	7.0	31.2		27.1				
Max Q Clear Time (g_c+11), s	23.8			4.8	3.5	25.1		8.3				
Green Ext Time (p_c), s	0.0	1.1		0.1	0.0	0.9		0.1				

Intersection Summary

HCM 6th Ctrl Delay	42.7
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.
User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 12: US 101 SB Ramps & Guerneville Rd

Lance Drive Residential TIA
Existing AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑					↑	↑	↑
Traffic Volume (veh/h)	0	979	483	254	890	0	0	0	0	344	2	263
Future Volume (veh/h)	0	979	483	254	890	0	0	0	0	344	2	263
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1856	1856	1856	1856	0				1856	1856	1856
Adj Flow Rate, veh/h	0	1100	205	285	1000	0				388	0	258
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89				0.89	0.89	0.89
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	1247	380	352	1412	0				1766	0	786
Arrive On Green	0.00	0.25	0.25	0.10	0.40	0.00				0.50	0.00	0.50
Sat Flow, veh/h	0	5233	1543	3428	3618	0				3534	0	1572
Grp Volume(v), veh/h	0	1100	205	285	1000	0				388	0	258
Grp Sat Flow(s),veh/h/ln	0	1689	1543	1714	1763	0				1767	0	1572
Q Serve(g_s), s	0.0	19.9	11.0	7.7	22.6	0.0				5.9	0.0	9.3
Cycle Q Clear(g_c), s	0.0	19.9	11.0	7.7	22.6	0.0				5.9	0.0	9.3
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1247	380	352	1412	0				1766	0	786
V/C Ratio(X)	0.00	0.88	0.54	0.81	0.71	0.00				0.22	0.00	0.33
Avail Cap(c_a), veh/h	0	1925	586	545	2082	0				1766	0	786
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.36	0.36	0.82	0.82	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	34.5	31.1	41.7	23.8	0.0				13.4	0.0	14.2
Incr Delay (d2), s/veh	0.0	0.8	0.2	2.1	0.2	0.0				0.3	0.0	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	8.0	4.0	3.3	8.9	0.0				2.2	0.0	3.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	35.3	31.3	43.8	24.0	0.0				13.6	0.0	15.3
LnGrp LOS	A	D	C	D	C	A				B	A	B
Approach Vol, veh/h		1305			1285						646	
Approach Delay, s/veh		34.7			28.4						14.3	
Approach LOS		C			C						B	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	4.7	28.3		52.1		42.9						
Change Period (Y+Rc), s	4.9	4.9		4.6		4.9						
Max Green Setting (Gmax), s	5.5	36.1		29.4		56.1						
Max Q Clear Time (g_c+19.7), s	19.7	21.9		11.3		24.6						
Green Ext Time (p_c), s	0.0	1.5		0.1		1.4						

Intersection Summary

HCM 6th Ctrl Delay 28.1
HCM 6th LOS C

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 13: US 101 NB Ramps & Guerneville Rd/Steele Ln

Lance Drive Residential TIA
Existing AM (95-120 Seconds)












Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↑↑			↑↑↑		↰	↰↱	↰			
Traffic Volume (veh/h)	347	976	0	0	788	203	356	1	411	0	0	0
Future Volume (veh/h)	347	976	0	0	788	203	356	1	411	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1856	1856	0	0	1856	1856	1856	1856	1856			
Adj Flow Rate, veh/h	390	1097	0	0	885	200	493	0	200			
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89			
Percent Heavy Veh, %	3	3	0	0	3	3	3	3	3			
Cap, veh/h	1531	2615	0	0	1002	225	559	0	249			
Arrive On Green	0.89	1.00	0.00	0.00	0.24	0.24	0.16	0.00	0.16			
Sat Flow, veh/h	3428	3618	0	0	4280	924	3534	0	1572			
Grp Volume(v), veh/h	390	1097	0	0	726	359	493	0	200			
Grp Sat Flow(s),veh/h/ln	1714	1763	0	0	1689	1661	1767	0	1572			
Q Serve(g_s), s	1.5	0.0	0.0	0.0	19.7	19.8	13.0	0.0	11.7			
Cycle Q Clear(g_c), s	1.5	0.0	0.0	0.0	19.7	19.8	13.0	0.0	11.7			
Prop In Lane	1.00		0.00	0.00		0.56	1.00		1.00			
Lane Grp Cap(c), veh/h	1531	2615	0	0	822	404	559	0	249			
V/C Ratio(X)	0.25	0.42	0.00	0.00	0.88	0.89	0.88	0.00	0.80			
Avail Cap(c_a), veh/h	1531	2615	0	0	1177	579	1094	0	487			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.60	0.60	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	2.9	0.0	0.0	0.0	34.6	34.7	39.1	0.0	38.6			
Incr Delay (d2), s/veh	0.0	0.3	0.0	0.0	4.5	9.1	1.8	0.0	2.3			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.4	0.1	0.0	0.0	8.3	8.7	5.5	0.0	4.4			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	2.9	0.3	0.0	0.0	39.1	43.8	41.0	0.0	40.9			
LnGrp LOS	A	A	A	A	D	D	D	A	D			
Approach Vol, veh/h												
		1487				1085		693				
Approach Delay, s/veh												
		1.0				40.6		40.9				
Approach LOS												
		A				D		D				
Timer - Assigned Phs												
		2				5		6		8		
Phs Duration (G+Y+Rc), s												
		75.4				47.3		28.0		19.6		
Change Period (Y+Rc), s												
		4.9				4.9		4.9		4.6		
Max Green Setting (Gmax), s												
		56.1				18.1		33.1		29.4		
Max Q Clear Time (g_c+I1), s												
		2.0				3.5		21.8		15.0		
Green Ext Time (p_c), s												
		1.6				0.1		1.3		0.1		
Intersection Summary												
HCM 6th Ctrl Delay												
			22.6									
HCM 6th LOS												
			C									

HCM 6th Signalized Intersection Summary 14: Stony Point Rd/Marlow Rd & W College Ave

Lance Drive Residential TIA
Existing AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	71	338	135	149	183	117	73	568	157	164	545	54
Future Volume (veh/h)	71	338	135	149	183	117	73	568	157	164	545	54
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	79	376	114	166	203	44	81	631	88	182	606	53
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	373	502	150	438	652	138	104	774	727	214	923	81
Arrive On Green	0.21	0.19	0.19	0.25	0.23	0.23	0.06	0.22	0.22	0.12	0.28	0.28
Sat Flow, veh/h	1767	2661	795	1767	2891	613	1767	3526	1538	1767	3274	286
Grp Volume(v), veh/h	79	247	243	166	122	125	81	631	88	182	326	333
Grp Sat Flow(s),veh/h/ln	1767	1763	1694	1767	1763	1741	1767	1763	1538	1767	1763	1797
Q Serve(g_s), s	3.5	12.6	12.9	7.4	5.5	5.7	4.3	16.2	1.4	9.6	15.5	15.5
Cycle Q Clear(g_c), s	3.5	12.6	12.9	7.4	5.5	5.7	4.3	16.2	1.4	9.6	15.5	15.5
Prop In Lane	1.00		0.47	1.00		0.35	1.00		1.00	1.00		0.16
Lane Grp Cap(c), veh/h	373	332	319	438	397	393	104	774	727	214	497	507
V/C Ratio(X)	0.21	0.74	0.76	0.38	0.31	0.32	0.78	0.82	0.12	0.85	0.66	0.66
Avail Cap(c_a), veh/h	373	482	464	438	508	502	136	891	778	218	527	537
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.52	0.52	0.52	1.00	1.00	1.00	0.69	0.69	0.69
Uniform Delay (d), s/veh	31.0	36.4	36.5	29.7	30.6	30.7	44.1	35.2	4.6	40.9	30.0	30.1
Incr Delay (d2), s/veh	0.3	3.6	4.4	0.3	0.2	0.2	19.2	5.2	0.1	19.2	1.9	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	5.5	5.5	3.1	2.3	2.3	2.4	7.2	0.6	5.2	6.5	6.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.2	40.0	40.9	29.9	30.8	30.9	63.3	40.5	4.7	60.1	31.9	31.9
LnGrp LOS	C	D	D	C	C	C	E	D	A	E	C	C
Approach Vol, veh/h	569				413		800				841	
Approach Delay, s/veh	39.2				30.5		38.9				38.0	
Approach LOS	D				C		D				D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	28.8	23.2	10.9	32.1	25.3	26.7	16.8	26.2				
Change Period (Y+Rc), s	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3				
Max Green Setting (Gmax), s	26.0	7.3	28.4	10.7	27.4	11.7	24.0					
Max Q Clear Time (g_c+19.4), s	14.9	6.3	17.5	5.5	7.7	11.6	18.2					
Green Ext Time (p_c), s	0.1	2.1	0.0	2.8	0.1	1.2	0.0	2.1				

Intersection Summary

HCM 6th Ctrl Delay 37.3

HCM 6th LOS D

Notes









User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

15: N Dutton Ave & W College Ave

Lance Drive Residential TIA
Existing AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	84	673	89	81	502	270	75	346	93	185	206	49
Future Volume (veh/h)	84	673	89	81	502	270	75	346	93	185	206	49
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	90	724	86	87	540	209	81	372	80	199	222	36
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	114	808	96	111	652	252	574	471	100	643	615	98
Arrive On Green	0.06	0.26	0.26	0.06	0.26	0.26	0.32	0.16	0.16	0.36	0.20	0.20
Sat Flow, veh/h	1767	3166	376	1767	2482	957	1767	2880	612	1767	3035	484
Grp Volume(v), veh/h	90	403	407	87	383	366	81	226	226	199	127	131
Grp Sat Flow(s),veh/h/ln	1767	1763	1779	1767	1763	1677	1767	1763	1729	1767	1763	1757
Q Serve(g_s), s	4.8	21.0	21.0	4.6	19.4	19.6	3.1	11.7	12.0	7.7	5.9	6.1
Cycle Q Clear(g_c), s	4.8	21.0	21.0	4.6	19.4	19.6	3.1	11.7	12.0	7.7	5.9	6.1
Prop In Lane	1.00		0.21	1.00		0.57	1.00		0.35	1.00		0.28
Lane Grp Cap(c), veh/h	114	450	454	111	463	441	574	288	283	643	357	356
V/C Ratio(X)	0.79	0.90	0.90	0.79	0.83	0.83	0.14	0.78	0.80	0.31	0.36	0.37
Avail Cap(c_a), veh/h	167	570	575	167	570	542	574	410	402	643	577	575
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.70	0.70	0.70	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.8	34.1	34.2	43.9	33.0	33.0	22.7	38.1	38.2	21.7	32.5	32.6
Incr Delay (d2), s/veh	5.7	9.2	9.3	6.5	6.8	7.4	0.0	3.8	4.7	0.1	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	9.8	9.9	2.2	8.9	8.6	1.3	5.2	5.3	3.0	2.4	2.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.5	43.4	43.4	50.4	39.7	40.4	22.8	41.9	42.9	21.8	32.8	32.9
LnGrp LOS	D	D	D	D	D	D	C	D	D	C	C	C
Approach Vol, veh/h	900			836			533			457		
Approach Delay, s/veh	44.0			41.1			39.4			28.0		
Approach LOS	D			D			D			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.9	28.2	33.8	23.2	9.1	28.9	37.6	19.4				
Change Period (Y+Rc), s	3.9	* 3.9	3.0	3.9	3.0	3.9	3.0	3.9				
Max Green Setting (Gmax), s	9.9	* 31	10.4	31.1	9.0	30.7	19.4	22.1				
Max Q Clear Time (g_c+10), s	10.6	23.0	5.1	8.1	6.8	21.6	9.7	14.0				
Green Ext Time (p_c), s	0.0	1.3	0.0	0.4	0.0	1.3	0.1	0.6				

Intersection Summary

HCM 6th Ctrl Delay 39.6

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection

Intersection Delay, s/veh 7.6

Intersection LOS A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	0	1	0	0	1	48	0	0	0	77	0	0
Future Vol, veh/h	0	1	0	0	1	48	0	0	0	77	0	0
Peak Hour Factor	0.66	0.66	0.92	0.92	0.66	0.66	0.92	0.92	0.92	0.66	0.92	0.66
Heavy Vehicles, %	3	3	2	2	3	3	2	2	2	3	2	3
Mvmt Flow	0	2	0	0	2	73	0	0	0	117	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0























Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.3	6.9	0	8
HCM LOS	A	A	-	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	0%	0%	100%
Vol Thru, %	100%	100%	2%	0%
Vol Right, %	0%	0%	98%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	0	1	49	77
LT Vol	0	0	0	77
Through Vol	0	1	1	0
RT Vol	0	0	48	0
Lane Flow Rate	0	2	74	117
Geometry Grp	1	1	1	1
Degree of Util (X)	0	0.002	0.074	0.139
Departure Headway (Hd)	4.155	4.214	3.568	4.282
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	0	839	990	839
Service Time	2.203	2.291	1.638	2.3
HCM Lane V/C Ratio	0	0.002	0.075	0.139
HCM Control Delay	7.2	7.3	6.9	8
HCM Lane LOS	N	A	A	A
HCM 95th-tile Q	0	0	0.2	0.5

HCM 6th Signalized Intersection Summary







1: Marlow Rd & Marlow Ct/W Steele Ln

Lance Drive Residential TIA
Existing AM (120 Seconds)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	3	6	210	2	170	1	497	214	126	480	2
Future Volume (veh/h)	1	3	6	210	2	170	1	497	214	126	480	2
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.96	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	1	3	0	245	0	121	1	578	166	147	558	2
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	9	26	0	1779	0	946	2	772	1121	178	1138	4
Arrive On Green	0.02	0.02	0.00	0.50	0.00	0.50	0.00	0.22	0.22	0.10	0.32	0.32
Sat Flow, veh/h	458	1374	0	3534	0	1566	1767	3526	1504	1767	3603	13
Grp Volume(v), veh/h	4	0	0	245	0	121	1	578	166	147	273	287
Grp Sat Flow(s),veh/h/ln	1833	0	0	1767	0	1566	1767	1763	1504	1767	1763	1853
Q Serve(g_s), s	0.3	0.0	0.0	4.4	0.0	0.0	0.1	18.4	4.1	9.8	15.0	15.0
Cycle Q Clear(g_c), s	0.3	0.0	0.0	4.4	0.0	0.0	0.1	18.4	4.1	9.8	15.0	15.0
Prop In Lane	0.25		0.00	1.00		1.00	1.00		1.00	1.00		0.01
Lane Grp Cap(c), veh/h	34	0	0	1779	0	946	2	772	1121	178	557	585
V/C Ratio(X)	0.12	0.00	0.00	0.14	0.00	0.13	0.41	0.75	0.15	0.83	0.49	0.49
Avail Cap(c_a), veh/h	231	0	0	1779	0	946	149	1040	1235	517	883	928
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.61	0.61	0.61	1.00	1.00	1.00
Uniform Delay (d), s/veh	57.9	0.0	0.0	15.9	0.0	10.2	59.9	43.8	5.2	52.9	33.2	33.2
Incr Delay (d2), s/veh	1.5	0.0	0.0	0.2	0.0	0.3	57.1	1.3	0.0	9.3	0.7	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.0	1.8	0.0	1.4	0.1	8.1	4.3	4.8	6.5	6.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.4	0.0	0.0	16.1	0.0	10.5	117.0	45.0	5.2	62.3	33.9	33.9
LnGrp LOS	E	A	A	B	A	B	F	D	A	E	C	C
Approach Vol, veh/h	4			366			745			707		
Approach Delay, s/veh	59.4			14.2			36.3			39.8		
Approach LOS	E			B			D			D		
Timer - Assigned Phs	2		3	4		6		7	8			
Phs Duration (G+Y+Rc), s	65.0		5.1	42.8		7.1		17.0	30.9			
Change Period (Y+Rc), s	4.6		4.9	4.9		4.9		4.9	4.6			
Max Green Setting (Gmax), s	15.4		10.1	60.1		15.1		35.1	35.4			
Max Q Clear Time (g_c+I1), s	6.4		2.1	17.0		2.3		11.8	20.4			
Green Ext Time (p_c), s	0.9		0.0	3.6		0.0		0.4	3.9			
Intersection Summary												
HCM 6th Ctrl Delay				33.3								
HCM 6th LOS				C								
Notes												
User approved pedestrian interval to be less than phase max green.												
User approved volume balancing among the lanes for turning movement.												

HCM 6th TWSC
2: Iroquois St/Apple Valley Ln & W Steele Ln

Lance Drive Residential TIA
Existing AM (120 Seconds)

Intersection												
Int Delay, s/veh	3.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	26	349	44	13	295	16	41	5	21	14	5	38
Future Vol, veh/h	26	349	44	13	295	16	41	5	21	14	5	38
Conflicting Peds, #/hr	12	0	24	24	0	12	4	0	4	4	0	4
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	60	-	-	80	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	31	420	53	16	355	19	49	6	25	17	6	46






















Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	386	0	0	497	0	0	960	951	475	937	968	381
Stage 1	-	-	-	-	-	-	533	533	-	409	409	-
Stage 2	-	-	-	-	-	-	427	418	-	528	559	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1167	-	-	1062	-	-	235	259	588	244	253	664
Stage 1	-	-	-	-	-	-	529	523	-	617	594	-
Stage 2	-	-	-	-	-	-	604	589	-	532	509	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1154	-	-	1038	-	-	202	240	572	218	234	654
Mov Cap-2 Maneuver	-	-	-	-	-	-	202	240	-	218	234	-
Stage 1	-	-	-	-	-	-	503	497	-	594	579	-
Stage 2	-	-	-	-	-	-	545	574	-	487	484	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.5			0.3			25.3			16		
HCM LOS							D			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	257	1154	-	-	1038	-	-	397
HCM Lane V/C Ratio	0.314	0.027	-	-	0.015	-	-	0.173
HCM Control Delay (s)	25.3	8.2	-	-	8.5	-	-	16
HCM Lane LOS	D	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	1.3	0.1	-	-	0	-	-	0.6

HCM 6th Signalized Intersection Summary 3: Range Ave & W Steele Ln

Lance Drive Residential TIA
Existing AM (120 Seconds)











												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	405	44	44	265	38	37	170	25	26	142	29
Future Volume (veh/h)	40	405	44	44	265	38	37	170	25	26	142	29
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.95	1.00		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	45	460	45	50	301	38	42	193	16	30	161	11
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	786	1263	124	651	1224	155	55	391	32	47	406	27
Arrive On Green	0.76	0.76	0.76	0.76	0.76	0.76	0.03	0.12	0.12	0.03	0.12	0.12
Sat Flow, veh/h	1031	1663	163	886	1612	203	1767	3284	269	1767	3336	225
Grp Volume(v), veh/h	45	0	505	50	0	339	42	103	106	30	84	88
Grp Sat Flow(s),veh/h/ln	1031	0	1825	886	0	1815	1767	1763	1790	1767	1763	1799
Q Serve(g_s), s	1.6	0.0	11.0	2.4	0.0	6.6	2.8	6.5	6.7	2.0	5.3	5.4
Cycle Q Clear(g_c), s	8.2	0.0	11.0	13.4	0.0	6.6	2.8	6.5	6.7	2.0	5.3	5.4
Prop In Lane	1.00		0.09	1.00		0.11	1.00		0.15	1.00		0.13
Lane Grp Cap(c), veh/h	786	0	1386	651	0	1378	55	210	213	47	214	219
V/C Ratio(X)	0.06	0.00	0.36	0.08	0.00	0.25	0.76	0.49	0.50	0.64	0.39	0.40
Avail Cap(c_a), veh/h	786	0	1386	651	0	1378	162	413	419	147	398	406
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.84	0.84	0.84	1.00	1.00	1.00
Uniform Delay (d), s/veh	5.5	0.0	4.8	7.0	0.0	4.3	57.7	49.4	49.5	57.9	48.6	48.7
Incr Delay (d2), s/veh	0.1	0.0	0.7	0.2	0.0	0.4	6.4	0.5	0.6	5.4	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	3.7	0.5	0.0	2.2	1.3	2.9	3.0	1.0	2.3	2.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	5.6	0.0	5.5	7.3	0.0	4.7	64.1	50.0	50.1	63.3	49.0	49.1
LnGrp LOS	A	A	A	A	A	A	E	D	D	E	D	D
Approach Vol, veh/h		550			389			251			202	
Approach Delay, s/veh		5.5			5.0			52.4			51.2	
Approach LOS		A			A			D			D	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		94.7	6.8	18.5		94.7	7.1	18.2				
Change Period (Y+Rc), s		3.6	3.0	3.9		3.6	3.9	* 3.9				
Max Green Setting (Gmax), s		71.4	11.0	27.1		71.4	10.0	* 28				
Max Q Clear Time (g_c+I1), s		13.0	4.8	7.4		15.4	4.0	8.7				
Green Ext Time (p_c), s		1.1	0.0	0.3		0.8	0.0	0.3				
Intersection Summary												
HCM 6th Ctrl Delay			20.5									
HCM 6th LOS			C									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

HCM 6th Signalized Intersection Summary

4: Marlow Rd & Guerneville Rd

Lance Drive Residential TIA
Existing AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	109	437	141	138	262	89	124	463	162	110	484	80
Future Volume (veh/h)	109	437	141	138	262	89	124	463	162	110	484	80
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	118	475	108	150	285	67	135	503	62	120	526	74
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	145	620	419	179	563	130	163	635	436	218	654	92
Arrive On Green	0.08	0.18	0.18	0.10	0.20	0.20	0.09	0.18	0.18	0.04	0.07	0.07
Sat Flow, veh/h	1767	3526	1556	1767	2838	656	1767	3526	1539	1767	3095	434
Grp Volume(v), veh/h	118	475	108	150	175	177	135	503	62	120	299	301
Grp Sat Flow(s),veh/h/ln	1767	1763	1556	1767	1763	1730	1767	1763	1539	1767	1763	1766
Q Serve(g_s), s	7.9	15.4	2.3	10.0	10.6	10.9	9.0	16.4	0.0	8.0	20.0	20.2
Cycle Q Clear(g_c), s	7.9	15.4	2.3	10.0	10.6	10.9	9.0	16.4	0.0	8.0	20.0	20.2
Prop In Lane	1.00		1.00	1.00		0.38	1.00		1.00	1.00		0.25
Lane Grp Cap(c), veh/h	145	620	419	179	350	343	163	635	436	218	372	373
V/C Ratio(X)	0.82	0.77	0.26	0.84	0.50	0.52	0.83	0.79	0.14	0.55	0.80	0.81
Avail Cap(c_a), veh/h	246	861	525	290	474	466	275	961	578	246	451	452
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	0.99	0.99	0.99	0.59	0.59	0.59	0.93	0.93	0.93
Uniform Delay (d), s/veh	54.2	47.1	5.6	53.0	42.8	42.9	53.5	47.0	32.3	54.3	53.3	53.4
Incr Delay (d2), s/veh	10.6	2.8	0.3	11.0	5.0	5.4	6.3	1.6	0.1	2.0	7.9	8.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	6.9	1.8	4.9	5.0	5.1	4.2	7.2	1.3	3.8	10.3	10.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	64.8	49.9	6.0	64.0	47.8	48.3	59.8	48.6	32.4	56.3	61.2	61.6
LnGrp LOS	E	D	A	E	D	D	E	D	C	E	E	E
Approach Vol, veh/h	701			502			700			720		
Approach Delay, s/veh	45.6			52.8			49.3			60.6		
Approach LOS	D			D			D			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.8	26.8	16.4	30.6	15.1	29.5	20.1	26.9				
Change Period (Y+Rc), s	5.7	* 5.7	5.3	5.3	5.3	5.7	5.3	5.3				
Max Green Setting (Gmax), s	29.3	* 29	18.7	30.7	16.7	32.3	16.7	32.7				
Max Q Clear Time (g_c+I1), s	17.4	17.4	11.0	22.2	9.9	12.9	10.0	18.4				
Green Ext Time (p_c), s	0.2	2.6	0.2	2.3	0.1	1.8	0.1	2.9				

Intersection Summary

HCM 6th Ctrl Delay 52.1

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary

5: Ridley Ave & Guerneville Rd

Lance Drive Residential TIA
Existing AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	673	25	56	429	11	36	4	56	15	4	15
Future Volume (veh/h)	20	673	25	56	429	11	36	4	56	15	4	15
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	0.98		0.96	0.98		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	22	756	21	63	482	8	40	4	6	17	4	2
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	738	3001	83	623	3042	50	148	16	15	143	31	12
Arrive On Green	0.86	0.86	0.86	0.28	0.28	0.28	0.09	0.09	0.09	0.09	0.09	0.09
Sat Flow, veh/h	897	3501	97	688	3549	59	1100	188	176	1063	365	136
Grp Volume(v), veh/h	22	381	396	63	239	251	50	0	0	23	0	0
Grp Sat Flow(s),veh/h/ln	897	1763	1835	688	1763	1845	1463	0	0	1563	0	0
Q Serve(g_s), s	0.7	4.7	4.7	8.3	12.2	12.2	2.2	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	13.0	4.7	4.7	13.0	12.2	12.2	3.7	0.0	0.0	1.4	0.0	0.0
Prop In Lane	1.00		0.05	1.00		0.03	0.80		0.12	0.74		0.09
Lane Grp Cap(c), veh/h	738	1511	1573	623	1511	1581	179	0	0	186	0	0
V/C Ratio(X)	0.03	0.25	0.25	0.10	0.16	0.16	0.28	0.00	0.00	0.12	0.00	0.00
Avail Cap(c_a), veh/h	738	1511	1573	623	1511	1581	517	0	0	532	0	0
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.93	0.93	0.93	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	3.7	1.6	1.6	12.6	10.5	10.5	51.8	0.0	0.0	50.8	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.4	0.4	0.0	0.0	0.0	0.3	0.0	0.0	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.9	0.9	1.5	5.4	5.7	1.5	0.0	0.0	0.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	3.8	1.9	1.9	12.6	10.6	10.6	52.1	0.0	0.0	50.9	0.0	0.0
LnGrp LOS	A	A	A	B	B	B	D	A	A	D	A	A
Approach Vol, veh/h	799			553			50			23		
Approach Delay, s/veh	2.0			10.8			52.1			50.9		
Approach LOS	A			B			D			D		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	106.8			13.2			106.8			13.2		
Change Period (Y+Rc), s	3.9			3.0			3.9			3.0		
Max Green Setting (Gmax), s	74.1			39.0			74.1			39.0		
Max Q Clear Time (g_c+I1), s	15.0			3.4			15.0			5.7		
Green Ext Time (p_c), s	1.5			0.0			1.1			0.1		

Intersection Summary

HCM 6th Ctrl Delay	7.9
HCM 6th LOS	A

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

6: Lance Dr & Guerneville Rd

Lance Drive Residential TIA

Existing AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	702	24	22	426	42	12	43	60	55	77	58
Future Volume (veh/h)	21	702	24	22	426	42	12	43	60	55	77	58
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.99	0.99		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	25	836	27	26	507	24	14	51	47	65	92	59
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	50	908	29	60	939	409	51	141	115	106	124	72
Arrive On Green	0.01	0.09	0.09	0.07	0.53	0.53	0.16	0.16	0.16	0.16	0.16	0.16
Sat Flow, veh/h	1767	3482	112	1767	3526	1536	110	881	717	416	772	446
Grp Volume(v), veh/h	25	423	440	26	507	24	112	0	0	216	0	0
Grp Sat Flow(s), veh/h/ln	1767	1763	1832	1767	1763	1536	1707	0	0	1634	0	0
Q Serve(g_s), s	1.7	28.6	28.6	1.7	11.3	0.9	0.0	0.0	0.0	8.1	0.0	0.0
Cycle Q Clear(g_c), s	1.7	28.6	28.6	1.7	11.3	0.9	7.0	0.0	0.0	15.1	0.0	0.0
Prop In Lane	1.00		0.06	1.00		1.00	0.12		0.42	0.30		0.27
Lane Grp Cap(c), veh/h	50	460	478	60	939	409	307	0	0	301	0	0
V/C Ratio(X)	0.50	0.92	0.92	0.44	0.54	0.06	0.36	0.00	0.00	0.72	0.00	0.00
Avail Cap(c_a), veh/h	143	804	835	158	1636	713	580	0	0	563	0	0
HCM Platoon Ratio	0.33	0.33	0.33	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.98	0.98	0.98	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	58.6	53.6	53.6	54.8	23.2	20.8	45.3	0.0	0.0	48.5	0.0	0.0
Incr Delay (d2), s/veh	2.9	5.1	5.0	1.8	2.2	0.3	0.3	0.0	0.0	1.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	14.2	14.7	0.8	4.0	0.4	3.1	0.0	0.0	6.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.4	58.7	58.6	56.6	25.4	21.1	45.5	0.0	0.0	49.7	0.0	0.0
LnGrp LOS	E	E	E	E	C	C	D	A	A	D	A	A
Approach Vol, veh/h	888			557			112			216		
Approach Delay, s/veh	58.7			26.7			45.5			49.7		
Approach LOS	E			C			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.4	36.6		23.8	8.7	37.3		23.8				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		4.6				
Max Green Setting (Gmax), s	9.4	54.7		39.4	9.7	55.7		39.4				
Max Q Clear Time (g_c+13), s	9.4	30.6		17.1	3.7	13.3		9.0				
Green Ext Time (p_c), s	0.0	0.7		0.3	0.0	0.6		0.1				

Intersection Summary

HCM 6th Ctrl Delay 46.7

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

7: N Dutton Ave/Westberry Dr & Guerneville Rd

Lance Drive Residential TIA
Existing AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	811	100	234	442	7	79	2	363	20	3	6
Future Volume (veh/h)	3	811	100	234	442	7	79	2	363	20	3	6
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	4	977	115	282	533	7	96	0	106	24	4	0
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	11	1029	121	1450	2640	35	153	0	733	59	10	0
Arrive On Green	0.01	0.32	0.32	0.85	1.00	1.00	0.04	0.00	0.04	0.04	0.04	0.00
Sat Flow, veh/h	1767	3170	373	3428	3562	47	3534	0	1562	1525	254	0
Grp Volume(v), veh/h	4	543	549	282	264	276	96	0	106	28	0	0
Grp Sat Flow(s), veh/h/ln	1767	1763	1780	1714	1763	1846	1767	0	1562	1779	0	0
Q Serve(g_s), s	0.3	36.1	36.1	1.8	0.0	0.0	3.2	0.0	0.0	1.8	0.0	0.0
Cycle Q Clear(g_c), s	0.3	36.1	36.1	1.8	0.0	0.0	3.2	0.0	0.0	1.8	0.0	0.0
Prop In Lane	1.00		0.21	1.00		0.03	1.00		1.00	0.86		0.00
Lane Grp Cap(c), veh/h	11	572	578	1450	1306	1368	153	0	733	68	0	0
V/C Ratio(X)	0.36	0.95	0.95	0.19	0.20	0.20	0.63	0.00	0.14	0.41	0.00	0.00
Avail Cap(c_a), veh/h	90	667	673	1450	1306	1368	265	0	782	377	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.94	0.94	0.94	0.95	0.95	0.95	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	59.4	39.6	39.6	5.5	0.0	0.0	56.4	0.0	18.3	56.4	0.0	0.0
Incr Delay (d2), s/veh	6.8	26.0	25.9	0.0	0.3	0.3	1.6	0.0	0.0	1.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	19.2	19.4	0.6	0.1	0.1	1.4	0.0	1.6	0.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	66.2	65.5	65.5	5.5	0.3	0.3	58.0	0.0	18.4	57.8	0.0	0.0
LnGrp LOS	E	E	E	A	A	A	E	A	B	E	A	A
Approach Vol, veh/h	1096			822			202			28		
Approach Delay, s/veh	65.5			2.1			37.2			57.8		
Approach LOS	E			A			D			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	56.0	44.2		9.2	6.0	94.2		10.5				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		5.3				
Max Green Setting (Gmax), s	45.4	45.4		25.4	6.1	59.0		9.0				
Max Q Clear Time (g_c+I1), s	38.1	38.1		3.8	2.3	2.0		5.2				
Green Ext Time (p_c), s	0.0	0.8		0.0	0.0	0.4		0.0				

Intersection Summary

HCM 6th Ctrl Delay 38.5

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 8: Herbert St/Coffey Ln & Guerneville Rd

Lance Drive Residential TIA
Existing AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	123	1040	29	17	516	36	20	12	15	75	5	148
Future Volume (veh/h)	123	1040	29	17	516	36	20	12	15	75	5	148
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		0.96	1.00		0.93	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	143	1209	33	20	600	39	23	14	1	87	6	39
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	167	1232	34	595	1991	129	63	38	3	143	10	278
Arrive On Green	0.19	0.70	0.70	0.67	1.00	1.00	0.06	0.06	0.06	0.09	0.09	0.09
Sat Flow, veh/h	1767	3500	95	1767	3350	217	1083	659	47	1658	114	1507
Grp Volume(v), veh/h	143	609	633	20	315	324	38	0	0	93	0	39
Grp Sat Flow(s), veh/h/ln	1767	1763	1832	1767	1763	1805	1789	0	0	1773	0	1507
Q Serve(g_s), s	9.4	39.7	39.8	0.5	0.0	0.0	2.5	0.0	0.0	6.1	0.0	2.6
Cycle Q Clear(g_c), s	9.4	39.7	39.8	0.5	0.0	0.0	2.5	0.0	0.0	6.1	0.0	2.6
Prop In Lane	1.00		0.05	1.00		0.12	0.61		0.03	0.94		1.00
Lane Grp Cap(c), veh/h	167	620	645	595	1048	1073	103	0	0	153	0	278
V/C Ratio(X)	0.86	0.98	0.98	0.03	0.30	0.30	0.37	0.00	0.00	0.61	0.00	0.14
Avail Cap(c_a), veh/h	225	642	667	595	1048	1073	373	0	0	386	0	476
HCM Platoon Ratio	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.79	0.79	0.79	0.95	0.95	0.95	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	47.9	17.4	17.4	13.1	0.0	0.0	54.4	0.0	0.0	52.9	0.0	41.4
Incr Delay (d2), s/veh	13.9	27.9	27.5	0.0	0.7	0.7	0.8	0.0	0.0	1.5	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.3	11.1	11.5	0.2	0.2	0.2	1.1	0.0	0.0	2.7	0.0	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.8	45.3	44.9	13.1	0.7	0.7	55.2	0.0	0.0	54.4	0.0	41.5
LnGrp LOS	E	D	D	B	A	A	E	A	A	D	A	D
Approach Vol, veh/h	1385			659			38			132		
Approach Delay, s/veh	46.8			1.1			55.2			50.5		
Approach LOS	D			A			E			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	45.7	47.5		15.2	16.6	76.6		11.5				
Change Period (Y+Rc), s	5.3	5.3		4.9	5.3	5.3		4.6				
Max Green Setting (Gmax), s	43.7	43.7		26.1	15.3	33.5		25.0				
Max Q Clear Time (g_c+1/2), s	41.8	41.8		8.1	11.4	2.0		4.5				
Green Ext Time (p_c), s	0.0	0.4		0.1	0.0	0.5		0.0				
Intersection Summary												
HCM 6th Ctrl Delay				33.6								
HCM 6th LOS				C								

HCM 6th Signalized Intersection Summary

9: Range Ave & Guerneville Rd

Lance Drive Residential TIA
Existing AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	141	674	143	69	391	5	128	86	72	27	98	102
Future Volume (veh/h)	141	674	143	69	391	5	128	86	72	27	98	102
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.96	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No		No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	150	717	0	73	416	0	78	172	8	29	104	9
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	210	777		93	543		128	255	12	102	189	16
Arrive On Green	0.24	0.44	0.00	0.05	0.15	0.00	0.07	0.07	0.07	0.02	0.02	0.02
Sat Flow, veh/h	1767	3618	0	1767	3618	0	1767	3511	162	1767	3272	279
Grp Volume(v), veh/h	150	717	0	73	416	0	78	90	90	29	55	58
Grp Sat Flow(s), veh/h/ln	1767	1763	0	1767	1763	0	1767	1856	1818	1767	1763	1788
Q Serve(g_s), s	9.4	23.0	0.0	4.9	13.6	0.0	5.1	5.7	5.8	1.9	3.7	3.8
Cycle Q Clear(g_c), s	9.4	23.0	0.0	4.9	13.6	0.0	5.1	5.7	5.8	1.9	3.7	3.8
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.09	1.00		0.16
Lane Grp Cap(c), veh/h	210	777		93	543		128	135	132	102	102	103
V/C Ratio(X)	0.71	0.92		0.79	0.77		0.61	0.67	0.68	0.28	0.54	0.56
Avail Cap(c_a), veh/h	437	1548		246	1166		227	238	233	216	216	219
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	0.84	0.84	0.00	0.98	0.98	0.00	1.00	1.00	1.00	0.83	0.83	0.83
Uniform Delay (d), s/veh	43.9	32.6	0.0	56.2	48.7	0.0	54.0	54.2	54.3	56.4	57.3	57.3
Incr Delay (d2), s/veh	1.4	1.8	0.0	5.3	9.7	0.0	1.7	2.1	2.3	0.5	1.4	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	7.4	0.0	2.3	6.7	0.0	2.3	2.7	2.7	0.9	1.7	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.3	34.4	0.0	61.5	58.4	0.0	55.7	56.4	56.5	56.9	58.7	58.8
LnGrp LOS	D	C		E	E		E	E	E	E	E	E
Approach Vol, veh/h	867		A		489		A		258		142	
Approach Delay, s/veh	36.3				58.9				56.2		58.3	
Approach LOS	D				E				E		E	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	1.6	31.7		12.2	19.6	23.8		13.3				
Change Period (Y+Rc), s	5.3	5.3		5.3	5.3	5.3		4.6				
Max Green Setting (Gmax), s	6.3	52.7		14.7	29.7	39.7		15.4				
Max Q Clear Time (g_c+10), s	10.9	25.0		5.8	11.4	15.6		7.8				
Green Ext Time (p_c), s	0.0	0.8		0.0	0.0	0.5		0.1				

Intersection Summary

HCM 6th Ctrl Delay 47.3

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

10: Guerneville Rd & Steele Wy

Lance Drive Residential TIA
Existing AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	708	40	51	433	5	23	10	53	381	16	9
Future Volume (veh/h)	25	708	40	51	433	5	23	10	53	381	16	9
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	28	805	25	58	492	5	18	21	5	446	0	4
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	858	2067	1001	200	569	6	90	94	171	508	0	988
Arrive On Green	0.49	0.59	0.59	0.06	0.16	0.16	0.05	0.05	0.05	0.14	0.00	0.14
Sat Flow, veh/h	1767	3526	1571	3428	3574	36	1767	1856	1556	3534	0	1566
Grp Volume(v), veh/h	28	805	25	58	243	254	18	21	5	446	0	4
Grp Sat Flow(s), veh/h/ln	1767	1763	1571	1714	1763	1848	1767	1856	1556	1767	0	1566
Q Serve(g_s), s	1.0	14.7	0.7	1.9	16.1	16.1	1.2	1.3	0.3	14.8	0.0	0.0
Cycle Q Clear(g_c), s	1.0	14.7	0.7	1.9	16.1	16.1	1.2	1.3	0.3	14.8	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.02	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	858	2067	1001	200	281	294	90	94	171	508	0	988
V/C Ratio(X)	0.03	0.39	0.02	0.29	0.86	0.87	0.20	0.22	0.03	0.88	0.00	0.00
Avail Cap(c_a), veh/h	858	2067	1001	203	580	608	398	417	442	798	0	1117
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.92	0.92	0.92	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	16.1	13.3	8.0	54.1	49.2	49.2	54.6	54.7	47.8	50.3	0.0	8.3
Incr Delay (d2), s/veh	0.0	0.5	0.0	0.3	3.1	3.0	0.4	0.4	0.0	4.4	0.0	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	0.4	5.7	0.3	0.8	7.3	7.6	0.5	0.6	0.1	6.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	16.2	13.8	8.1	54.4	52.3	52.2	55.0	55.1	47.8	54.8	0.0	8.3
LnGrp LOS	B	B	A	D	D	D	E	E	D	D	A	A
Approach Vol, veh/h	858			555			44			450		
Approach Delay, s/veh	13.7			52.5			54.2			54.4		
Approach LOS	B			D			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	1.9	75.2		22.1	63.1	24.0		10.7				
Change Period (Y+Rc), s	4.9	4.9		4.9	4.9	4.9		4.6				
Max Green Setting (Gmax), s	39.5			27.1	7.1	39.5		27.0				
Max Q Clear Time (g_c+13), s	16.7			16.8	3.0	18.1		3.3				
Green Ext Time (p_c), s	0.0	1.1		0.1	0.0	0.4		0.0				

Intersection Summary

HCM 6th Ctrl Delay	35.5
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.
User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

11: Cleveland Ave & Guerneville Rd

Lance Drive Residential TIA
Existing AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰ ↱	↑ ↑		↰ ↱	↑ ↑	↱	↰	↑ ↑		↰ ↱	↱ ↰	
Traffic Volume (veh/h)	52	1092	32	172	796	184	28	87	141	223	63	34
Future Volume (veh/h)	52	1092	32	172	796	184	28	87	141	223	63	34
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	57	1200	32	189	875	118	31	96	48	245	69	25
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	211	1311	35	243	944	411	723	948	443	347	127	46
Arrive On Green	0.06	0.26	0.26	0.07	0.27	0.27	0.41	0.41	0.41	0.10	0.10	0.10
Sat Flow, veh/h	3428	5070	135	3428	3526	1535	1767	2317	1084	3534	1293	468
Grp Volume(v), veh/h	57	799	433	189	875	118	31	71	73	245	0	94
Grp Sat Flow(s), veh/h/ln	1714	1689	1828	1714	1763	1535	1767	1763	1639	1767	0	1761
Q Serve(g_s), s	1.9	27.6	27.6	6.5	29.0	7.3	1.3	3.0	3.3	8.1	0.0	6.1
Cycle Q Clear(g_c), s	1.9	27.6	27.6	6.5	29.0	7.3	1.3	3.0	3.3	8.1	0.0	6.1
Prop In Lane	1.00		0.07	1.00		1.00	1.00		0.66	1.00		0.27
Lane Grp Cap(c), veh/h	211	873	473	243	944	411	723	721	670	347	0	173
V/C Ratio(X)	0.27	0.92	0.92	0.78	0.93	0.29	0.04	0.10	0.11	0.71	0.00	0.54
Avail Cap(c_a), veh/h	211	1185	641	374	1413	615	723	721	670	857	0	427
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.75	0.75	0.75	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	53.7	43.2	43.2	54.8	42.8	34.8	21.3	21.8	21.9	52.4	0.0	51.5
Incr Delay (d2), s/veh	0.3	7.5	12.5	1.7	4.7	0.1	0.1	0.3	0.3	1.0	0.0	1.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	12.2	13.9	2.8	13.0	2.7	0.6	1.3	1.3	3.6	0.0	2.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.0	50.7	55.7	56.5	47.5	35.0	21.4	22.1	22.3	53.4	0.0	52.5
LnGrp LOS	D	D	E	E	D	C	C	C	C	D	A	D
Approach Vol, veh/h	1289			1182			175			339		
Approach Delay, s/veh	52.5			47.7			22.1			53.2		
Approach LOS	D			D			C			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	3.4	35.9		54.0	12.3	37.0		16.7				
Change Period (Y+Rc), s	4.9	4.9		4.9	4.9	4.9		4.9				
Max Green Setting (Gmax), s	42.1			16.1	7.1	48.1		29.1				
Max Q Clear Time (g_c+1/3), s	29.6			5.3	3.9	31.0		10.1				
Green Ext Time (p_c), s	0.0	1.4		0.1	0.0	1.1		0.1				

Intersection Summary

HCM 6th Ctrl Delay 48.9

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 12: US 101 SB Ramps & Guerneville Rd

Lance Drive Residential TIA
Existing AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑					↑	↑	↑
Traffic Volume (veh/h)	0	979	483	254	890	0	0	0	0	344	2	263
Future Volume (veh/h)	0	979	483	254	890	0	0	0	0	344	2	263
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1856	1856	1856	1856	0				1856	1856	1856
Adj Flow Rate, veh/h	0	1100	205	285	1000	0				388	0	258
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89				0.89	0.89	0.89
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	1218	371	338	1339	0				1912	0	851
Arrive On Green	0.00	0.24	0.24	0.10	0.38	0.00				0.54	0.00	0.54
Sat Flow, veh/h	0	5233	1543	3428	3618	0				3534	0	1572
Grp Volume(v), veh/h	0	1100	205	285	1000	0				388	0	258
Grp Sat Flow(s),veh/h/ln	0	1689	1543	1714	1763	0				1767	0	1572
Q Serve(g_s), s	0.0	25.3	14.0	9.8	29.5	0.0				6.8	0.0	10.8
Cycle Q Clear(g_c), s	0.0	25.3	14.0	9.8	29.5	0.0				6.8	0.0	10.8
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1218	371	338	1339	0				1912	0	851
V/C Ratio(X)	0.00	0.90	0.55	0.84	0.75	0.00				0.20	0.00	0.30
Avail Cap(c_a), veh/h	0	2030	619	546	2118	0				1912	0	851
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.37	0.37	0.84	0.84	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	44.2	39.9	53.2	32.2	0.0				14.2	0.0	15.1
Incr Delay (d2), s/veh	0.0	0.8	0.2	2.8	0.3	0.0				0.2	0.0	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	10.5	5.3	4.3	12.3	0.0				2.6	0.0	3.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	45.0	40.1	55.9	32.5	0.0				14.4	0.0	16.0
LnGrp LOS	A	D	D	E	C	A				B	A	B
Approach Vol, veh/h		1305			1285						646	
Approach Delay, s/veh		44.2			37.7						15.1	
Approach LOS		D			D						B	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	6.7	33.8		69.5		50.5						
Change Period (Y+Rc), s	4.9	4.9		4.6		4.9						
Max Green Setting (Gmax), s	48.1			38.4		72.1						
Max Q Clear Time (g_c+I1), s	27.3			12.8		31.5						
Green Ext Time (p_c), s	0.0	1.6		0.1		1.4						

Intersection Summary

HCM 6th Ctrl Delay	35.8
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

13: US 101 NB Ramps & Guerneville Rd/Steele Ln

Lance Drive Residential TIA
Existing AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↑↑			↑↑↑		↰	↰↱	↰			
Traffic Volume (veh/h)	347	976	0	0	788	203	356	1	411	0	0	0
Future Volume (veh/h)	347	976	0	0	788	203	356	1	411	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1856	1856	0	0	1856	1856	1856	1856	1856			
Adj Flow Rate, veh/h	390	1097	0	0	885	200	493	0	200			
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89			
Percent Heavy Veh, %	3	3	0	0	3	3	3	3	3			
Cap, veh/h	1671	2702	0	0	980	220	546	0	243			
Arrive On Green	0.97	1.00	0.00	0.00	0.24	0.24	0.15	0.00	0.15			
Sat Flow, veh/h	3428	3618	0	0	4280	924	3534	0	1572			
Grp Volume(v), veh/h	390	1097	0	0	726	359	493	0	200			
Grp Sat Flow(s),veh/h/ln	1714	1763	0	0	1689	1660	1767	0	1572			
Q Serve(g_s), s	0.4	0.0	0.0	0.0	25.0	25.2	16.4	0.0	14.8			
Cycle Q Clear(g_c), s	0.4	0.0	0.0	0.0	25.0	25.2	16.4	0.0	14.8			
Prop In Lane	1.00		0.00	0.00		0.56	1.00		1.00			
Lane Grp Cap(c), veh/h	1671	2702	0	0	805	396	546	0	243			
V/C Ratio(X)	0.23	0.41	0.00	0.00	0.90	0.91	0.90	0.00	0.82			
Avail Cap(c_a), veh/h	1671	2702	0	0	1185	582	1160	0	516			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.58	0.58	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.8	0.0	0.0	0.0	44.3	44.4	49.9	0.0	49.2			
Incr Delay (d2), s/veh	0.0	0.3	0.0	0.0	5.3	10.6	2.3	0.0	2.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.1	0.1	0.0	0.0	10.9	11.4	7.2	0.0	5.8			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.8	0.3	0.0	0.0	49.6	55.0	52.2	0.0	51.8			
LnGrp LOS	A	A	A	A	D	D	D	A	D			
Approach Vol, veh/h	1487			1085			693					
Approach Delay, s/veh	0.4			51.4			52.1					
Approach LOS	A			D			D					
Timer - Assigned Phs	2			5			6			8		
Phs Duration (G+Y+Rc), s	96.9			63.4			33.5			23.1		
Change Period (Y+Rc), s	4.9			4.9			4.9			4.6		
Max Green Setting (Gmax), s	71.1			24.1			42.1			39.4		
Max Q Clear Time (g_c+I1), s	2.0			2.4			27.2			18.4		
Green Ext Time (p_c), s	1.6			0.1			1.4			0.1		

Intersection Summary

HCM 6th Ctrl Delay	28.3
HCM 6th LOS	C










Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 14: Stony Point Rd/Marlow Rd & W College Ave

Lance Drive Residential TIA
Existing AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	71	338	135	149	183	117	73	568	157	164	545	54
Future Volume (veh/h)	71	338	135	149	183	117	73	568	157	164	545	54
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	79	376	114	166	203	44	81	631	88	182	606	53
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	495	465	139	563	617	131	103	741	824	211	889	78
Arrive On Green	0.28	0.17	0.17	0.32	0.21	0.21	0.06	0.21	0.21	0.12	0.27	0.27
Sat Flow, veh/h	1767	2661	795	1767	2890	613	1767	3526	1537	1767	3274	286
Grp Volume(v), veh/h	79	247	243	166	122	125	81	631	88	182	326	333
Grp Sat Flow(s),veh/h/ln	1767	1763	1693	1767	1763	1741	1767	1763	1537	1767	1763	1797
Q Serve(g_s), s	4.0	16.2	16.6	8.5	7.0	7.3	5.4	20.7	1.6	12.1	19.8	19.9
Cycle Q Clear(g_c), s	4.0	16.2	16.6	8.5	7.0	7.3	5.4	20.7	1.6	12.1	19.8	19.9
Prop In Lane	1.00		0.47	1.00		0.35	1.00		1.00	1.00		0.16
Lane Grp Cap(c), veh/h	495	308	296	563	376	372	103	741	824	211	479	488
V/C Ratio(X)	0.16	0.80	0.82	0.29	0.32	0.34	0.79	0.85	0.11	0.86	0.68	0.68
Avail Cap(c_a), veh/h	495	383	368	563	504	498	180	887	888	314	577	588
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.49	0.49	0.49	1.00	1.00	1.00	0.68	0.68	0.68
Uniform Delay (d), s/veh	32.6	47.5	47.7	30.7	39.9	40.0	55.8	45.6	4.8	51.8	39.0	39.1
Incr Delay (d2), s/veh	0.1	9.5	11.4	0.1	0.2	0.3	12.4	6.9	0.1	10.5	1.7	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	7.8	7.8	3.6	3.0	3.1	2.7	9.5	0.6	5.9	8.6	8.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.7	57.1	59.1	30.9	40.1	40.2	68.2	52.5	4.8	62.3	40.8	40.8
LnGrp LOS	C	E	E	C	D	D	E	D	A	E	D	D
Approach Vol, veh/h	569		413			800			841			
Approach Delay, s/veh	54.6		36.4			48.8			45.4			
Approach LOS	D		D			D			D			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	43.6	26.3	12.3	37.9	38.9	30.9	19.7	30.5				
Change Period (Y+Rc), s	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3				
Max Green Setting (Gmax), s	41.8	26.1	12.2	39.3	13.0	34.3	21.3	30.2				
Max Q Clear Time (g_c+I10), s	18.6	18.6	7.4	21.9	6.0	9.3	14.1	22.7				
Green Ext Time (p_c), s	0.3	1.7	0.1	3.5	0.1	1.3	0.3	2.6				

Intersection Summary

HCM 6th Ctrl Delay 47.0

HCM 6th LOS D

Notes









User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

15: N Dutton Ave & W College Ave

Lance Drive Residential TIA
Existing AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	84	673	89	81	502	270	75	346	93	185	206	49
Future Volume (veh/h)	84	673	89	81	502	270	75	346	93	185	206	49
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	90	724	86	87	540	209	81	372	80	199	222	36
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	113	796	94	109	638	246	649	446	95	724	598	95
Arrive On Green	0.06	0.25	0.25	0.06	0.26	0.26	0.37	0.15	0.15	0.41	0.20	0.20
Sat Flow, veh/h	1767	3166	376	1767	2482	957	1767	2879	612	1767	3035	484
Grp Volume(v), veh/h	90	403	407	87	383	366	81	226	226	199	127	131
Grp Sat Flow(s),veh/h/ln	1767	1763	1779	1767	1763	1677	1767	1763	1728	1767	1763	1756
Q Serve(g_s), s	6.0	26.6	26.7	5.8	24.7	24.9	3.6	14.9	15.3	9.0	7.5	7.7
Cycle Q Clear(g_c), s	6.0	26.6	26.7	5.8	24.7	24.9	3.6	14.9	15.3	9.0	7.5	7.7
Prop In Lane	1.00		0.21	1.00		0.57	1.00		0.35	1.00		0.28
Lane Grp Cap(c), veh/h	113	443	447	109	453	431	649	273	267	724	347	346
V/C Ratio(X)	0.80	0.91	0.91	0.80	0.85	0.85	0.12	0.83	0.84	0.27	0.37	0.38
Avail Cap(c_a), veh/h	177	604	609	177	604	574	649	383	376	724	574	572
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.69	0.69	0.69	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	55.4	43.6	43.6	55.6	42.3	42.4	25.2	49.2	49.3	23.6	41.7	41.8
Incr Delay (d2), s/veh	4.1	8.9	9.0	4.9	6.5	7.1	0.0	7.1	8.7	0.1	0.2	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	12.5	12.6	2.7	11.4	11.0	1.5	7.0	7.2	3.7	3.2	3.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.5	52.5	52.6	60.5	48.8	49.5	25.2	56.3	58.0	23.6	42.0	42.1
LnGrp LOS	E	D	D	E	D	D	C	E	E	C	D	D
Approach Vol, veh/h	900			836			533			457		
Approach Delay, s/veh	53.3			50.3			52.3			34.0		
Approach LOS	D			D			D			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	1.3	34.1	47.1	27.5	10.6	34.7	52.2	22.5				
Change Period (Y+Rc), s	3.9	* 3.9	3.0	3.9	3.0	3.9	3.0	3.9				
Max Green Setting (Gmax), s	2.0	* 41	14.0	39.1	12.0	41.1	27.0	26.1				
Max Q Clear Time (g_c+11), s	28.7	5.6	9.7	8.0	26.9	11.0	17.3					
Green Ext Time (p_c), s	0.0	1.5	0.0	0.4	0.0	1.5	0.1	0.7				

Intersection Summary

HCM 6th Ctrl Delay 48.9

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection

Intersection Delay, s/veh 7.6

Intersection LOS A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	0	1	0	0	1	48	0	0	0	77	0	0
Future Vol, veh/h	0	1	0	0	1	48	0	0	0	77	0	0
Peak Hour Factor	0.66	0.66	0.92	0.92	0.66	0.66	0.92	0.92	0.92	0.66	0.92	0.66
Heavy Vehicles, %	3	3	2	2	3	3	2	2	2	3	2	3
Mvmt Flow	0	2	0	0	2	73	0	0	0	117	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0























Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.3	6.9	0	8
HCM LOS	A	A	-	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	0%	0%	100%
Vol Thru, %	100%	100%	2%	0%
Vol Right, %	0%	0%	98%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	0	1	49	77
LT Vol	0	0	0	77
Through Vol	0	1	1	0
RT Vol	0	0	48	0
Lane Flow Rate	0	2	74	117
Geometry Grp	1	1	1	1
Degree of Util (X)	0	0.002	0.074	0.139
Departure Headway (Hd)	4.155	4.214	3.568	4.282
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	0	839	990	839
Service Time	2.203	2.291	1.638	2.3
HCM Lane V/C Ratio	0	0.002	0.075	0.139
HCM Control Delay	7.2	7.3	6.9	8
HCM Lane LOS	N	A	A	A
HCM 95th-tile Q	0	0	0.2	0.5

HCM 6th Signalized Intersection Summary







1: Marlow Rd & Marlow Ct/W Steele Ln

Lance Drive Residential TIA
Existing AM (120-140 Seconds)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	3	6	210	2	170	1	497	214	126	480	2
Future Volume (veh/h)	1	3	6	210	2	170	1	497	214	126	480	2
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.96	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	1	3	0	245	0	121	1	578	166	147	558	2
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	10	30	0	1899	0	995	2	730	1156	173	1086	4
Arrive On Green	0.02	0.02	0.00	0.54	0.00	0.54	0.00	0.21	0.21	0.10	0.30	0.30
Sat Flow, veh/h	458	1374	0	3534	0	1566	1767	3526	1502	1767	3603	13
Grp Volume(v), veh/h	4	0	0	245	0	121	1	578	166	147	273	287
Grp Sat Flow(s),veh/h/ln	1833	0	0	1767	0	1566	1767	1763	1502	1767	1763	1853
Q Serve(g_s), s	0.3	0.0	0.0	4.8	0.0	0.0	0.1	21.8	4.4	11.5	17.9	17.9
Cycle Q Clear(g_c), s	0.3	0.0	0.0	4.8	0.0	0.0	0.1	21.8	4.4	11.5	17.9	17.9
Prop In Lane	0.25		0.00	1.00		1.00	1.00		1.00	1.00		0.01
Lane Grp Cap(c), veh/h	40	0	0	1899	0	995	2	730	1156	173	531	559
V/C Ratio(X)	0.10	0.00	0.00	0.13	0.00	0.12	0.42	0.79	0.14	0.85	0.51	0.51
Avail Cap(c_a), veh/h	250	0	0	1899	0	995	77	992	1268	329	744	782
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.59	0.59	0.59	1.00	1.00	1.00
Uniform Delay (d), s/veh	67.1	0.0	0.0	16.1	0.0	10.1	69.8	52.6	5.1	62.1	40.4	40.4
Incr Delay (d2), s/veh	1.1	0.0	0.0	0.1	0.0	0.3	55.9	1.9	0.0	11.0	0.8	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	0.0	2.0	0.0	1.5	0.1	9.8	5.2	5.7	7.9	8.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	68.1	0.0	0.0	16.2	0.0	10.3	125.7	54.5	5.2	73.1	41.2	41.2
LnGrp LOS	E	A	A	B	A	B	F	D	A	E	D	D
Approach Vol, veh/h	4			366				745				707
Approach Delay, s/veh	68.1			14.3				43.6				47.8
Approach LOS	E			B				D				D
Timer - Assigned Phs	2		3	4		6		7	8			
Phs Duration (G+Y+Rc), s	79.8		5.1	47.1		8.0		18.6	33.6			
Change Period (Y+Rc), s	4.6		4.9	4.9		4.9		4.9	4.6			
Max Green Setting (Gmax), s	36.4		6.1	59.1		19.1		26.1	39.4			
Max Q Clear Time (g_c+I1), s	6.8		2.1	19.9		2.3		13.5	23.8			
Green Ext Time (p_c), s	1.3		0.0	3.6		0.0		0.3	3.9			
Intersection Summary												
HCM 6th Ctrl Delay	39.4											
HCM 6th LOS	D											
Notes												
User approved pedestrian interval to be less than phase max green.												
User approved volume balancing among the lanes for turning movement.												






















HCM 6th TWSC
2: Iroquois St/Apple Valley Ln & W Steele Ln

Lance Drive Residential TIA
Existing AM (120-140 Seconds)

Intersection												
Int Delay, s/veh	3.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	26	349	44	13	295	16	41	5	21	14	5	38
Future Vol, veh/h	26	349	44	13	295	16	41	5	21	14	5	38
Conflicting Peds, #/hr	12	0	24	24	0	12	4	0	4	4	0	4
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	60	-	-	80	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	31	420	53	16	355	19	49	6	25	17	6	46
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	386	0	0	497	0	0	960	951	475	937	968	381
Stage 1	-	-	-	-	-	-	533	533	-	409	409	-
Stage 2	-	-	-	-	-	-	427	418	-	528	559	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1167	-	-	1062	-	-	235	259	588	244	253	664
Stage 1	-	-	-	-	-	-	529	523	-	617	594	-
Stage 2	-	-	-	-	-	-	604	589	-	532	509	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1154	-	-	1038	-	-	202	240	572	218	234	654
Mov Cap-2 Maneuver	-	-	-	-	-	-	202	240	-	218	234	-
Stage 1	-	-	-	-	-	-	503	497	-	594	579	-
Stage 2	-	-	-	-	-	-	545	574	-	487	484	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.5			0.3			25.3			16		
HCM LOS							D			C		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	257	1154	-	-	1038	-	-	397				
HCM Lane V/C Ratio	0.314	0.027	-	-	0.015	-	-	0.173				
HCM Control Delay (s)	25.3	8.2	-	-	8.5	-	-	16				
HCM Lane LOS	D	A	-	-	A	-	-	C				
HCM 95th %tile Q(veh)	1.3	0.1	-	-	0	-	-	0.6				

HCM 6th Signalized Intersection Summary 3: Range Ave & W Steele Ln

Lance Drive Residential TIA
Existing AM (120-140 Seconds)











												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	405	44	44	265	38	37	170	25	26	142	29
Future Volume (veh/h)	40	405	44	44	265	38	37	170	25	26	142	29
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.95	1.00		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	45	460	45	50	301	38	42	193	16	30	161	11
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	807	1301	127	671	1261	159	54	367	30	43	374	25
Arrive On Green	0.78	0.78	0.78	0.78	0.78	0.78	0.03	0.11	0.11	0.02	0.11	0.11
Sat Flow, veh/h	1032	1663	163	886	1612	203	1767	3283	269	1767	3335	225
Grp Volume(v), veh/h	45	0	505	50	0	339	42	103	106	30	84	88
Grp Sat Flow(s),veh/h/ln	1032	0	1826	886	0	1815	1767	1763	1790	1767	1763	1797
Q Serve(g_s), s	1.7	0.0	11.7	2.5	0.0	7.0	3.3	7.7	7.9	2.4	6.2	6.4
Cycle Q Clear(g_c), s	8.7	0.0	11.7	14.2	0.0	7.0	3.3	7.7	7.9	2.4	6.2	6.4
Prop In Lane	1.00		0.09	1.00		0.11	1.00		0.15	1.00		0.13
Lane Grp Cap(c), veh/h	807	0	1428	671	0	1420	54	197	200	43	198	202
V/C Ratio(X)	0.06	0.00	0.35	0.07	0.00	0.24	0.78	0.52	0.53	0.69	0.43	0.43
Avail Cap(c_a), veh/h	807	0	1428	671	0	1420	189	404	410	126	341	348
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.79	0.79	0.79	1.00	1.00	1.00
Uniform Delay (d), s/veh	5.3	0.0	4.6	6.7	0.0	4.1	67.4	58.6	58.7	67.7	57.9	58.0
Incr Delay (d2), s/veh	0.1	0.0	0.7	0.2	0.0	0.4	6.9	0.6	0.6	7.0	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	4.0	0.5	0.0	2.4	1.6	3.4	3.6	1.1	2.8	2.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	5.4	0.0	5.3	6.9	0.0	4.5	74.3	59.3	59.4	74.8	58.5	58.5
LnGrp LOS	A	A	A	A	A	A	E	E	E	E	E	E
Approach Vol, veh/h		550			389			251			202	
Approach Delay, s/veh		5.3			4.8			61.8			60.9	
Approach LOS		A			A			E			E	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		113.1	7.3	19.6		113.1	7.3	19.6				
Change Period (Y+Rc), s		3.6	3.0	3.9		3.6	3.9	* 3.9				
Max Green Setting (Gmax), s		87.4	15.0	27.1		87.4	10.0	* 32				
Max Q Clear Time (g_c+I1), s		13.7	5.3	8.4		16.2	4.4	9.9				
Green Ext Time (p_c), s		1.1	0.0	0.2		0.8	0.0	0.3				
Intersection Summary												
HCM 6th Ctrl Delay			23.4									
HCM 6th LOS			C									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

HCM 6th Signalized Intersection Summary

4: Marlow Rd & Guerneville Rd

Lance Drive Residential TIA
Existing AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	109	437	141	138	262	89	124	463	162	110	484	80
Future Volume (veh/h)	109	437	141	138	262	89	124	463	162	110	484	80
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	118	475	108	150	285	67	135	503	62	120	526	74
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	143	606	411	177	550	127	161	627	431	210	635	89
Arrive On Green	0.08	0.17	0.17	0.10	0.19	0.19	0.09	0.18	0.18	0.12	0.21	0.21
Sat Flow, veh/h	1767	3526	1556	1767	2837	656	1767	3526	1539	1767	3095	434
Grp Volume(v), veh/h	118	475	108	150	175	177	135	503	62	120	299	301
Grp Sat Flow(s),veh/h/ln	1767	1763	1556	1767	1763	1730	1767	1763	1539	1767	1763	1766
Q Serve(g_s), s	8.5	16.8	2.4	10.9	11.6	11.9	9.8	17.8	0.0	8.3	21.1	21.3
Cycle Q Clear(g_c), s	8.5	16.8	2.4	10.9	11.6	11.9	9.8	17.8	0.0	8.3	21.1	21.3
Prop In Lane	1.00		1.00	1.00		0.38	1.00		1.00	1.00		0.25
Lane Grp Cap(c), veh/h	143	606	411	177	342	336	161	627	431	210	362	362
V/C Ratio(X)	0.82	0.78	0.26	0.85	0.51	0.53	0.84	0.80	0.14	0.57	0.83	0.83
Avail Cap(c_a), veh/h	241	849	518	295	479	470	281	995	592	254	471	471
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.99	0.99	0.99	0.59	0.59	0.59	0.92	0.92	0.92
Uniform Delay (d), s/veh	58.8	51.5	5.7	57.5	46.9	47.0	58.1	51.2	35.3	54.2	49.4	49.5
Incr Delay (d2), s/veh	11.1	3.2	0.3	11.1	5.3	5.8	6.7	1.5	0.1	2.3	8.4	8.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.2	7.6	2.0	5.3	5.5	5.6	4.6	7.9	1.5	3.8	10.0	10.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	70.0	54.8	6.0	68.6	52.2	52.8	64.8	52.8	35.4	56.4	57.8	58.3
LnGrp LOS	E	D	A	E	D	D	E	D	D	E	E	E
Approach Vol, veh/h	701			502			700			720		
Approach Delay, s/veh	49.8			57.3			53.5			57.8		
Approach LOS	D			E			D			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	28.0	17.2	32.0	15.8	30.9	20.7	28.4					
Change Period (Y+Rc), s	5.7	5.7	5.3	5.3	5.3	5.7	5.3	5.3				
Max Green Setting (Gmax), s	31	31	20.7	34.7	17.7	35.3	18.7	36.7				
Max Q Clear Time (g_c+I12, s)	18.8	18.8	11.8	23.3	10.5	13.9	10.3	19.8				
Green Ext Time (p_c), s	0.2	2.7	0.2	2.7	0.1	1.8	0.2	3.1				

Intersection Summary

HCM 6th Ctrl Delay 54.4

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.







* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary

5: Ridley Ave & Guerneville Rd

Lance Drive Residential TIA
Existing AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	673	25	56	429	11	36	4	56	15	4	15
Future Volume (veh/h)	20	673	25	56	429	11	36	4	56	15	4	15
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	0.98		0.96	0.98		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	22	756	21	63	482	8	40	4	6	17	4	2
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	832	3044	85	625	3086	51	136	15	14	132	29	11
Arrive On Green	0.87	0.87	0.87	1.00	1.00	1.00	0.08	0.08	0.08	0.08	0.08	0.08
Sat Flow, veh/h	897	3501	97	688	3549	59	1108	181	176	1075	356	136
Grp Volume(v), veh/h	22	381	396	63	239	251	50	0	0	23	0	0
Grp Sat Flow(s),veh/h/ln	897	1763	1835	688	1763	1845	1464	0	0	1568	0	0
Q Serve(g_s), s	0.5	5.0	5.0	0.6	0.0	0.0	2.6	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.5	5.0	5.0	5.6	0.0	0.0	4.3	0.0	0.0	1.7	0.0	0.0
Prop In Lane	1.00		0.05	1.00		0.03	0.80		0.12	0.74		0.09
Lane Grp Cap(c), veh/h	832	1533	1596	625	1533	1604	165	0	0	172	0	0
V/C Ratio(X)	0.03	0.25	0.25	0.10	0.16	0.16	0.30	0.00	0.00	0.13	0.00	0.00
Avail Cap(c_a), veh/h	832	1533	1596	625	1533	1604	484	0	0	499	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.94	0.94	0.94	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	1.2	1.5	1.5	0.1	0.0	0.0	61.0	0.0	0.0	59.9	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.4	0.4	0.0	0.0	0.0	0.4	0.0	0.0	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	1.0	1.0	0.0	0.0	0.0	1.7	0.0	0.0	0.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	1.3	1.9	1.9	0.1	0.0	0.0	61.3	0.0	0.0	60.0	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	E	A	A	E	A	A
Approach Vol, veh/h	799		553			50			23			
Approach Delay, s/veh	1.9		0.0			61.3			60.0			
Approach LOS	A		A			E			E			
Timer - Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	125.6		14.4		125.6		14.4					
Change Period (Y+Rc), s	3.9		3.0		3.9		3.0					
Max Green Setting (Gmax), s	90.1		43.0		90.1		43.0					
Max Q Clear Time (g_c+I1), s	7.0		3.7		7.6		6.3					
Green Ext Time (p_c), s	1.5		0.0		1.1		0.1					
Intersection Summary												
HCM 6th Ctrl Delay			4.2									
HCM 6th LOS			A									

HCM 6th Signalized Intersection Summary

6: Lance Dr & Guerneville Rd

Lance Drive Residential TIA
Existing AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	702	24	22	426	42	12	43	60	55	77	58
Future Volume (veh/h)	21	702	24	22	426	42	12	43	60	55	77	58
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.99	0.99		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	25	836	27	26	507	24	14	51	47	65	92	59
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	47	871	28	56	900	392	46	137	112	99	118	69
Arrive On Green	0.05	0.50	0.50	0.01	0.08	0.08	0.16	0.16	0.16	0.16	0.16	0.16
Sat Flow, veh/h	1767	3482	112	1767	3526	1536	111	868	708	416	747	437
Grp Volume(v), veh/h	25	423	440	26	507	24	112	0	0	216	0	0
Grp Sat Flow(s), veh/h/ln	1767	1763	1832	1767	1763	1536	1688	0	0	1601	0	0
Q Serve(g_s), s	1.9	32.3	32.3	2.0	19.4	2.0	0.0	0.0	0.0	10.1	0.0	0.0
Cycle Q Clear(g_c), s	1.9	32.3	32.3	2.0	19.4	2.0	8.2	0.0	0.0	18.3	0.0	0.0
Prop In Lane	1.00		0.06	1.00		1.00	0.12		0.42	0.30		0.27
Lane Grp Cap(c), veh/h	47	441	458	56	900	392	295	0	0	286	0	0
V/C Ratio(X)	0.53	0.96	0.96	0.46	0.56	0.06	0.38	0.00	0.00	0.76	0.00	0.00
Avail Cap(c_a), veh/h	135	852	886	135	1705	743	577	0	0	557	0	0
HCM Platoon Ratio	2.00	2.00	2.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.98	0.98	0.98	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	65.4	34.3	34.3	68.1	56.6	48.7	53.1	0.0	0.0	57.2	0.0	0.0
Incr Delay (d2), s/veh	3.4	5.9	5.7	2.1	2.5	0.3	0.3	0.0	0.0	1.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	11.1	11.5	1.0	9.5	0.8	3.6	0.0	0.0	7.6	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	68.8	40.2	40.0	70.2	59.1	49.0	53.4	0.0	0.0	58.7	0.0	0.0
LnGrp LOS	E	D	D	E	E	D	D	A	A	E	A	A
Approach Vol, veh/h	888			557			112			216		
Approach Delay, s/veh	40.9			59.2			53.4			58.7		
Approach LOS	D			E			D			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.8	40.3		26.7	9.0	41.0		26.7				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		4.6				
Max Green Setting (Gmax), s	10.5	67.7		46.4	10.7	67.7		46.4				
Max Q Clear Time (g_c+14), s	14.5	34.3		20.3	3.9	21.4		10.2				
Green Ext Time (p_c), s	0.0	0.7		0.3	0.0	0.6		0.1				

Intersection Summary

HCM 6th Ctrl Delay 49.6

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

7: N Dutton Ave/Westberry Dr & Guerneville Rd

Lance Drive Residential TIA
Existing AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	811	100	234	442	7	79	2	363	20	3	6
Future Volume (veh/h)	3	811	100	234	442	7	79	2	363	20	3	6
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	4	977	115	282	533	7	96	0	106	24	4	0
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	11	1023	120	1555	2742	36	145	0	777	55	9	0
Arrive On Green	0.01	0.32	0.32	0.91	1.00	1.00	0.04	0.00	0.04	0.04	0.04	0.00
Sat Flow, veh/h	1767	3170	373	3428	3562	47	3534	0	1561	1525	254	0
Grp Volume(v), veh/h	4	543	549	282	264	276	96	0	106	28	0	0
Grp Sat Flow(s), veh/h/ln	1767	1763	1780	1714	1763	1846	1767	0	1561	1779	0	0
Q Serve(g_s), s	0.3	42.2	42.3	1.3	0.0	0.0	3.7	0.0	0.0	2.2	0.0	0.0
Cycle Q Clear(g_c), s	0.3	42.2	42.3	1.3	0.0	0.0	3.7	0.0	0.0	2.2	0.0	0.0
Prop In Lane	1.00		0.21	1.00		0.03	1.00		1.00	0.86		0.00
Lane Grp Cap(c), veh/h	11	569	574	1555	1357	1421	145	0	777	65	0	0
V/C Ratio(X)	0.37	0.96	0.96	0.18	0.19	0.19	0.66	0.00	0.14	0.43	0.00	0.00
Avail Cap(c_a), veh/h	77	698	704	1555	1357	1421	220	0	810	352	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.95	0.95	0.95	0.96	0.96	0.96	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	69.3	46.4	46.4	3.6	0.0	0.0	66.2	0.0	19.2	66.0	0.0	0.0
Incr Delay (d2), s/veh	7.1	27.2	27.2	0.0	0.3	0.3	1.9	0.0	0.0	1.7	0.0	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	22.4	22.6	0.4	0.1	0.1	1.7	0.0	1.9	1.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	76.4	73.7	73.6	3.6	0.3	0.3	68.1	0.0	19.2	67.7	0.0	0.0
LnGrp LOS	E	E	E	A	A	A	E	A	B	E	A	A
Approach Vol, veh/h	1096			822			202			28		
Approach Delay, s/veh	73.6			1.4			42.4			67.7		
Approach LOS	E			A			D			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	68.8	50.5		9.7	6.2	113.1		11.1				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		5.3				
Max Green Setting (Gmax), s	77.8	55.4		27.7	6.1	77.0		8.7				
Max Q Clear Time (g_c+I1), s	13.3	44.3		4.2	2.3	2.0		5.7				
Green Ext Time (p_c), s	0.0	0.9		0.0	0.0	0.4		0.0				

Intersection Summary

HCM 6th Ctrl Delay 43.0

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 8: Herbert St/Coffey Ln & Guerneville Rd

Lance Drive Residential TIA
Existing AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	123	1040	29	17	516	36	20	12	15	75	5	148
Future Volume (veh/h)	123	1040	29	17	516	36	20	12	15	75	5	148
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		0.96	1.00		0.93	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	143	1209	33	20	600	39	23	14	1	87	6	39
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	164	1233	34	648	2099	136	59	36	3	137	9	271
Arrive On Green	0.19	0.70	0.70	0.37	0.63	0.63	0.05	0.05	0.05	0.08	0.08	0.08
Sat Flow, veh/h	1767	3500	95	1767	3350	217	1083	659	47	1658	114	1505
Grp Volume(v), veh/h	143	609	633	20	315	324	38	0	0	93	0	39
Grp Sat Flow(s), veh/h/ln	1767	1763	1832	1767	1763	1805	1789	0	0	1773	0	1505
Q Serve(g_s), s	11.0	46.1	46.3	1.0	11.4	11.4	2.9	0.0	0.0	7.1	0.0	3.1
Cycle Q Clear(g_c), s	11.0	46.1	46.3	1.0	11.4	11.4	2.9	0.0	0.0	7.1	0.0	3.1
Prop In Lane	1.00		0.05	1.00		0.12	0.61		0.03	0.94		1.00
Lane Grp Cap(c), veh/h	164	621	646	648	1104	1131	97	0	0	147	0	271
V/C Ratio(X)	0.87	0.98	0.98	0.03	0.29	0.29	0.39	0.00	0.00	0.63	0.00	0.14
Avail Cap(c_a), veh/h	263	786	817	648	1104	1131	321	0	0	333	0	429
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.79	0.79	0.79	0.95	0.95	0.95	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	56.2	20.2	20.2	28.4	11.9	11.9	63.9	0.0	0.0	62.1	0.0	48.8
Incr Delay (d2), s/veh	8.4	27.6	27.2	0.0	0.6	0.6	0.9	0.0	0.0	1.7	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.8	14.2	14.7	0.4	4.5	4.6	1.3	0.0	0.0	3.3	0.0	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	64.6	47.8	47.4	28.4	12.5	12.5	64.9	0.0	0.0	63.8	0.0	48.9
LnGrp LOS	E	D	D	C	B	B	E	A	A	E	A	D
Approach Vol, veh/h	1385			659			38			132		
Approach Delay, s/veh	49.4			13.0			64.9			59.4		
Approach LOS	D			B			E			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	56.7	54.6		16.5	18.3	93.0		12.2				
Change Period (Y+Rc), s	5.3	5.3		4.9	5.3	5.3		4.6				
Max Green Setting (Gmax), s	62.4	62.4		26.3	20.8	47.7		25.1				
Max Q Clear Time (g_c+13), s	48.3	48.3		9.1	13.0	13.4		4.9				
Green Ext Time (p_c), s	0.0	1.0		0.1	0.0	0.5		0.0				
Intersection Summary												
HCM 6th Ctrl Delay	39.4											
HCM 6th LOS	D											

HCM 6th Signalized Intersection Summary 9: Range Ave & Guerneville Rd

Lance Drive Residential TIA
Existing AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	141	674	143	69	391	5	128	86	72	27	98	102
Future Volume (veh/h)	141	674	143	69	391	5	128	86	72	27	98	102
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.96	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No		No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	150	717	0	73	416	0	78	172	8	29	104	9
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	219	794		93	543		157	311	14	102	189	16
Arrive On Green	0.12	0.23	0.00	0.05	0.15	0.00	0.09	0.09	0.09	0.06	0.06	0.06
Sat Flow, veh/h	1767	3618	0	1767	3618	0	1767	3512	162	1767	3272	279
Grp Volume(v), veh/h	150	717	0	73	416	0	78	90	90	29	55	58
Grp Sat Flow(s),veh/h/ln	1767	1763	0	1767	1763	0	1767	1856	1819	1767	1763	1788
Q Serve(g_s), s	9.8	23.7	0.0	4.9	13.6	0.0	5.0	5.6	5.7	1.9	3.7	3.8
Cycle Q Clear(g_c), s	9.8	23.7	0.0	4.9	13.6	0.0	5.0	5.6	5.7	1.9	3.7	3.8
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.09	1.00		0.16
Lane Grp Cap(c), veh/h	219	794		93	543		157	165	161	102	102	103
V/C Ratio(X)	0.69	0.90		0.79	0.77		0.50	0.55	0.56	0.28	0.54	0.56
Avail Cap(c_a), veh/h	275	1307		158	1072		492	516	506	161	160	162
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.85	0.85	0.00	0.98	0.98	0.00	1.00	1.00	1.00	0.81	0.81	0.81
Uniform Delay (d), s/veh	50.3	45.2	0.0	56.2	48.7	0.0	52.1	52.4	52.4	54.2	55.0	55.0
Incr Delay (d2), s/veh	2.4	2.9	0.0	5.3	9.8	0.0	0.9	1.1	1.1	0.5	1.3	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.4	10.4	0.0	2.3	6.7	0.0	2.3	2.7	2.6	0.8	1.6	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.8	48.1	0.0	61.5	58.4	0.0	53.0	53.4	53.5	54.6	56.3	56.5
LnGrp LOS	D	D		E	E		D	D	D	D	E	E
Approach Vol, veh/h	867		A		489		A		258		142	
Approach Delay, s/veh	48.9				58.9				53.3		56.0	
Approach LOS	D				E				D		E	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	1.6	32.3		12.2	20.1	23.8		15.2				
Change Period (Y+Rc), s	5.3	5.3		5.3	5.3	5.3		4.6				
Max Green Setting (Gmax), s	44.5	44.5		10.9	18.7	36.5		33.4				
Max Q Clear Time (g_c+10), s	25.7	25.7		5.8	11.8	15.6		7.7				
Green Ext Time (p_c), s	0.0	0.8		0.0	0.0	0.5		0.1				

Intersection Summary

HCM 6th Ctrl Delay	52.9
HCM 6th LOS	D

Notes

- User approved pedestrian interval to be less than phase max green.
- User approved volume balancing among the lanes for turning movement.
- Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary 10: Guerneville Rd & Steele Wy

Lance Drive Residential TIA
Existing AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	708	40	51	433	5	23	10	53	381	16	9
Future Volume (veh/h)	25	708	40	51	433	5	23	10	53	381	16	9
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	28	805	25	58	492	5	18	21	5	446	0	4
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	917	2201	1054	171	555	6	83	87	151	498	0	1037
Arrive On Green	0.52	0.62	0.62	0.05	0.16	0.16	0.05	0.05	0.05	0.14	0.00	0.14
Sat Flow, veh/h	1767	3526	1571	3428	3574	36	1767	1856	1554	3534	0	1566
Grp Volume(v), veh/h	28	805	25	58	243	254	18	21	5	446	0	4
Grp Sat Flow(s), veh/h/ln	1767	1763	1571	1714	1763	1848	1767	1856	1554	1767	0	1566
Q Serve(g_s), s	1.1	15.6	0.7	2.3	18.9	18.9	1.4	1.5	0.4	17.4	0.0	0.0
Cycle Q Clear(g_c), s	1.1	15.6	0.7	2.3	18.9	18.9	1.4	1.5	0.4	17.4	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.02	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	917	2201	1054	171	274	287	83	87	151	498	0	1037
V/C Ratio(X)	0.03	0.37	0.02	0.34	0.89	0.89	0.22	0.24	0.03	0.90	0.00	0.00
Avail Cap(c_a), veh/h	917	2201	1054	198	631	661	346	363	383	886	0	1209
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.92	0.92	0.92	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	16.5	12.8	7.7	64.3	57.9	57.9	64.2	64.3	57.3	59.1	0.0	8.1
Incr Delay (d2), s/veh	0.0	0.4	0.0	0.4	3.8	3.7	0.5	0.5	0.0	2.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	6.1	0.3	1.0	8.6	9.1	0.6	0.7	0.2	8.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.5	13.2	7.7	64.7	61.7	61.6	64.7	64.8	57.3	61.6	0.0	8.1
LnGrp LOS	B	B	A	E	E	E	E	E	E	E	A	A
Approach Vol, veh/h	858			555			44			450		
Approach Delay, s/veh	13.2			62.0			63.9			61.2		
Approach LOS	B			E			E			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	1.9	92.3		24.6	77.6	26.7		11.2				
Change Period (Y+Rc), s	4.9	4.9		4.9	4.9	4.9		4.6				
Max Green Setting (Gmax), s	50.1			35.1	8.1	50.1		27.4				
Max Q Clear Time (g_c+14), s	17.6			19.4	3.1	20.9		3.5				
Green Ext Time (p_c), s	0.0	1.1		0.1	0.0	0.4		0.0				

Intersection Summary

HCM 6th Ctrl Delay 39.9

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

11: Cleveland Ave & Guerneville Rd

Lance Drive Residential TIA
Existing AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↑↑↑		↔↔	↑↑	↔	↔	↑↑		↔	↔↔	
Traffic Volume (veh/h)	52	1092	32	172	796	184	28	87	141	223	63	34
Future Volume (veh/h)	52	1092	32	172	796	184	28	87	141	223	63	34
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	57	1200	32	189	875	118	31	96	48	245	69	25
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	204	1297	35	236	935	407	779	1021	478	335	123	44
Arrive On Green	0.06	0.26	0.26	0.07	0.27	0.27	0.44	0.44	0.44	0.09	0.09	0.09
Sat Flow, veh/h	3428	5070	135	3428	3526	1535	1767	2318	1084	3534	1292	468
Grp Volume(v), veh/h	57	799	433	189	875	118	31	71	73	245	0	94
Grp Sat Flow(s), veh/h/ln	1714	1689	1828	1714	1763	1535	1767	1763	1639	1767	0	1761
Q Serve(g_s), s	2.2	32.3	32.3	7.6	34.0	8.6	1.4	3.3	3.6	9.4	0.0	7.1
Cycle Q Clear(g_c), s	2.2	32.3	32.3	7.6	34.0	8.6	1.4	3.3	3.6	9.4	0.0	7.1
Prop In Lane	1.00		0.07	1.00		1.00	1.00		0.66	1.00		0.27
Lane Grp Cap(c), veh/h	204	864	467	236	935	407	779	777	722	335	0	167
V/C Ratio(X)	0.28	0.93	0.93	0.80	0.94	0.29	0.04	0.09	0.10	0.73	0.00	0.56
Avail Cap(c_a), veh/h	223	1257	680	394	1488	648	779	777	722	1088	0	542
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.73	0.73	0.73	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	63.0	50.8	50.8	64.3	50.3	41.0	22.3	22.8	22.9	61.6	0.0	60.6
Incr Delay (d2), s/veh	0.3	7.0	11.7	1.8	4.3	0.1	0.1	0.2	0.3	1.2	0.0	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	14.4	16.2	3.4	15.4	3.3	0.6	1.5	1.5	4.3	0.0	3.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	63.3	57.8	62.5	66.0	54.6	41.1	22.4	23.1	23.2	62.8	0.0	61.7
LnGrp LOS	E	E	E	E	D	D	C	C	C	E	A	E
Approach Vol, veh/h	1289			1182			175			339		
Approach Delay, s/veh	59.7			55.1			23.0			62.5		
Approach LOS	E			E			C			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	40.7			66.6	13.2	42.0		18.2				
Change Period (Y+Rc), s	4.9	4.9		4.9	4.9	4.9		4.9				
Max Green Setting (Gmax), s	52.1			9.1	9.1	59.1		43.1				
Max Q Clear Time (g_c+19.6)	34.3			5.6	4.2	36.0		11.4				
Green Ext Time (p_c), s	0.0	1.5		0.0	0.0	1.1		0.1				

Intersection Summary

HCM 6th Ctrl Delay 56.0

HCM 6th LOS E

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 12: US 101 SB Ramps & Guerneville Rd

Lance Drive Residential TIA
Existing AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑					↑	↑	↑
Traffic Volume (veh/h)	0	979	483	254	890	0	0	0	0	344	2	263
Future Volume (veh/h)	0	979	483	254	890	0	0	0	0	344	2	263
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1856	1856	1856	1856	0				1856	1856	1856
Adj Flow Rate, veh/h	0	1100	205	285	1000	0				388	0	258
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89				0.89	0.89	0.89
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	1201	366	331	1300	0				1992	0	886
Arrive On Green	0.00	0.24	0.24	0.10	0.37	0.00				0.56	0.00	0.56
Sat Flow, veh/h	0	5233	1543	3428	3618	0				3534	0	1572
Grp Volume(v), veh/h	0	1100	205	285	1000	0				388	0	258
Grp Sat Flow(s),veh/h/ln	0	1689	1543	1714	1763	0				1767	0	1572
Q Serve(g_s), s	0.0	29.6	16.4	11.5	35.0	0.0				7.5	0.0	12.0
Cycle Q Clear(g_c), s	0.0	29.6	16.4	11.5	35.0	0.0				7.5	0.0	12.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1201	366	331	1300	0				1992	0	886
V/C Ratio(X)	0.00	0.92	0.56	0.86	0.77	0.00				0.19	0.00	0.29
Avail Cap(c_a), veh/h	0	2066	629	566	2143	0				1992	0	886
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.36	0.36	0.85	0.85	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	52.0	47.0	62.3	39.0	0.0				15.0	0.0	16.0
Incr Delay (d2), s/veh	0.0	0.8	0.2	2.4	0.3	0.0				0.2	0.0	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	12.5	6.3	5.1	15.0	0.0				3.0	0.0	4.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	52.8	47.2	64.7	39.3	0.0				15.2	0.0	16.8
LnGrp LOS	A	D	D	E	D	A				B	A	B
Approach Vol, veh/h		1305			1285						646	
Approach Delay, s/veh		51.9			44.9						15.8	
Approach LOS		D			D						B	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	8.4	38.1		83.5		56.5						
Change Period (Y+Rc), s	4.9	4.9		4.6		4.9						
Max Green Setting (Gmax), s	28.5	57.1		45.4		85.1						
Max Q Clear Time (g_c+I1), s	13.5	31.6		14.0		37.0						
Green Ext Time (p_c), s	0.0	1.6		0.1		1.4						

Intersection Summary

HCM 6th Ctrl Delay 41.9
HCM 6th LOS D

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 13: US 101 NB Ramps & Guerneville Rd/Steele Ln

Lance Drive Residential TIA
Existing AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↑↑			↑↑↑		↰	↰↱	↰			
Traffic Volume (veh/h)	347	976	0	0	788	203	356	1	411	0	0	0
Future Volume (veh/h)	347	976	0	0	788	203	356	1	411	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1856	1856	0	0	1856	1856	1856	1856	1856			
Adj Flow Rate, veh/h	390	1097	0	0	885	200	493	0	200			
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89			
Percent Heavy Veh, %	3	3	0	0	3	3	3	3	3			
Cap, veh/h	1747	2750	0	0	968	218	538	0	239			
Arrive On Green	1.00	1.00	0.00	0.00	0.24	0.24	0.15	0.00	0.15			
Sat Flow, veh/h	3428	3618	0	0	4280	924	3534	0	1572			
Grp Volume(v), veh/h	390	1097	0	0	726	359	493	0	200			
Grp Sat Flow(s),veh/h/ln	1714	1763	0	0	1689	1660	1767	0	1572			
Q Serve(g_s), s	0.0	0.0	0.0	0.0	29.3	29.6	19.2	0.0	17.3			
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	29.3	29.6	19.2	0.0	17.3			
Prop In Lane	1.00		0.00	0.00		0.56	1.00		1.00			
Lane Grp Cap(c), veh/h	1747	2750	0	0	795	391	538	0	239			
V/C Ratio(X)	0.22	0.40	0.00	0.00	0.91	0.92	0.92	0.00	0.84			
Avail Cap(c_a), veh/h	1747	2750	0	0	1209	594	1171	0	521			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.57	0.57	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	52.1	52.2	58.5	0.0	57.6			
Incr Delay (d2), s/veh	0.0	0.2	0.0	0.0	5.5	11.0	2.7	0.0	2.9			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	0.1	0.0	0.0	12.9	13.4	8.6	0.0	6.9			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.2	0.0	0.0	57.7	63.2	61.2	0.0	60.6			
LnGrp LOS	A	A	A	A	E	E	E	A	E			
Approach Vol, veh/h	1487			1085			693					
Approach Delay, s/veh	0.2			59.5			61.0					
Approach LOS	A			E			E					
Timer - Assigned Phs	2			5		6	8					
Phs Duration (G+Y+Rc), s	114.1			76.2		37.8	25.9					
Change Period (Y+Rc), s	4.9			4.9		4.9	4.6					
Max Green Setting (Gmax), s	84.1			29.1		50.1	46.4					
Max Q Clear Time (g_c+I1), s	2.0			2.0		31.6	21.2					
Green Ext Time (p_c), s	1.6			0.1		1.4	0.1					

Intersection Summary

HCM 6th Ctrl Delay	32.8
HCM 6th LOS	C

Notes










User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

14: Stony Point Rd/Marlow Rd & W College Ave

Lance Drive Residential TIA
Existing AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	71	338	135	149	183	117	73	568	157	164	545	54
Future Volume (veh/h)	71	338	135	149	183	117	73	568	157	164	545	54
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	79	376	114	166	203	44	81	631	88	182	606	53
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	557	451	135	622	597	127	102	738	875	208	883	77
Arrive On Green	0.32	0.17	0.17	0.35	0.21	0.21	0.06	0.21	0.21	0.12	0.27	0.27
Sat Flow, veh/h	1767	2661	795	1767	2890	613	1767	3526	1537	1767	3274	286
Grp Volume(v), veh/h	79	247	243	166	122	125	81	631	88	182	326	333
Grp Sat Flow(s),veh/h/ln	1767	1763	1693	1767	1763	1741	1767	1763	1537	1767	1763	1797
Q Serve(g_s), s	4.5	19.0	19.5	9.4	8.3	8.6	6.3	24.1	1.8	14.2	23.2	23.3
Cycle Q Clear(g_c), s	4.5	19.0	19.5	9.4	8.3	8.6	6.3	24.1	1.8	14.2	23.2	23.3
Prop In Lane	1.00		0.47	1.00		0.35	1.00		1.00	1.00		0.16
Lane Grp Cap(c), veh/h	557	299	287	622	364	359	102	738	875	208	475	484
V/C Ratio(X)	0.14	0.83	0.85	0.27	0.34	0.35	0.80	0.86	0.10	0.87	0.69	0.69
Avail Cap(c_a), veh/h	557	387	371	622	512	506	173	924	957	324	613	625
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.48	0.48	0.48	1.00	1.00	1.00	0.68	0.68	0.68
Uniform Delay (d), s/veh	34.4	56.2	56.4	32.4	47.4	47.5	65.2	53.3	5.0	60.7	45.8	45.8
Incr Delay (d2), s/veh	0.1	11.0	13.2	0.1	0.3	0.3	13.2	6.6	0.0	10.8	1.5	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	9.2	9.3	4.0	3.6	3.7	3.2	11.2	0.7	6.9	10.2	10.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.5	67.2	69.6	32.5	47.6	47.8	78.4	59.9	5.0	71.5	47.3	47.3
LnGrp LOS	C	E	E	C	D	D	E	E	A	E	D	D
Approach Vol, veh/h	569				413		800				841	
Approach Delay, s/veh	63.7				41.6		55.7				52.5	
Approach LOS	E				D		E				D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	54.6	29.0	13.3	43.0	49.4	34.2	21.8	34.6				
Change Period (Y+Rc), s	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3				
Max Green Setting (Gmax), s	25.3	30.7	13.7	48.7	15.7	40.7	25.7	36.7				
Max Q Clear Time (g_c+I1), s	11.4	21.5	8.3	25.3	6.5	10.6	16.2	26.1				
Green Ext Time (p_c), s	0.3	1.9	0.1	3.9	0.1	1.3	0.3	3.2				

Intersection Summary

HCM 6th Ctrl Delay 54.2

HCM 6th LOS D

Notes









User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

15: N Dutton Ave & W College Ave

Lance Drive Residential TIA
Existing AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	84	673	89	81	502	270	75	346	93	185	206	49
Future Volume (veh/h)	84	673	89	81	502	270	75	346	93	185	206	49
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	90	724	86	87	540	209	81	372	80	199	222	36
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	111	787	93	108	629	242	694	432	92	770	584	93
Arrive On Green	0.06	0.25	0.25	0.06	0.25	0.25	0.39	0.15	0.15	0.44	0.19	0.19
Sat Flow, veh/h	1767	3166	376	1767	2482	957	1767	2879	612	1767	3035	484
Grp Volume(v), veh/h	90	403	407	87	383	366	81	226	226	199	127	131
Grp Sat Flow(s),veh/h/ln	1767	1763	1779	1767	1763	1677	1767	1763	1728	1767	1763	1756
Q Serve(g_s), s	7.0	31.2	31.2	6.8	29.0	29.2	4.1	17.5	17.9	10.0	8.8	9.1
Cycle Q Clear(g_c), s	7.0	31.2	31.2	6.8	29.0	29.2	4.1	17.5	17.9	10.0	8.8	9.1
Prop In Lane	1.00		0.21	1.00		0.57	1.00		0.35	1.00		0.28
Lane Grp Cap(c), veh/h	111	438	442	108	446	425	694	264	259	770	339	338
V/C Ratio(X)	0.81	0.92	0.92	0.81	0.86	0.86	0.12	0.85	0.87	0.26	0.38	0.39
Avail Cap(c_a), veh/h	189	618	624	252	681	648	694	530	520	770	568	566
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.68	0.68	0.68	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	64.8	51.2	51.2	64.9	49.9	49.9	27.0	58.0	58.2	25.1	49.2	49.3
Incr Delay (d2), s/veh	3.7	9.1	9.2	5.3	4.4	4.9	0.0	3.1	3.6	0.1	0.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	14.7	14.9	3.2	13.2	12.7	1.7	8.0	8.0	4.2	3.9	4.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	68.4	60.4	60.4	70.2	54.3	54.8	27.1	61.1	61.8	25.2	49.4	49.6
LnGrp LOS	E	E	E	E	D	D	C	E	E	C	D	D
Approach Vol, veh/h	900				836				533			
Approach Delay, s/veh	61.2				56.2				56.2			
Approach LOS	E				E				E			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	2.4	38.7	58.0	30.9	11.8	39.4	64.0	24.9				
Change Period (Y+Rc), s	3.9	* 3.9	3.0	3.9	3.0	3.9	3.0	3.9				
Max Green Setting (Gmax), s	49.0	* 49	12.0	45.1	15.0	54.1	15.0	42.1				
Max Q Clear Time (g_c+1/3), s	33.2	33.2	6.1	11.1	9.0	31.2	12.0	19.9				
Green Ext Time (p_c), s	0.0	1.6	0.0	0.4	0.0	1.6	0.0	0.9				

Intersection Summary

HCM 6th Ctrl Delay 54.9

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection

Intersection Delay, s/veh 7.6

Intersection LOS A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	0	1	0	0	1	48	0	0	0	77	0	0
Future Vol, veh/h	0	1	0	0	1	48	0	0	0	77	0	0
Peak Hour Factor	0.66	0.66	0.92	0.92	0.66	0.66	0.92	0.92	0.92	0.66	0.92	0.66
Heavy Vehicles, %	3	3	2	2	3	3	2	2	2	3	2	3
Mvmt Flow	0	2	0	0	2	73	0	0	0	117	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.3	6.9	0	8
HCM LOS	A	A	-	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	0%	0%	100%
Vol Thru, %	100%	100%	2%	0%
Vol Right, %	0%	0%	98%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	0	1	49	77
LT Vol	0	0	0	77
Through Vol	0	1	1	0
RT Vol	0	0	48	0
Lane Flow Rate	0	2	74	117
Geometry Grp	1	1	1	1
Degree of Util (X)	0	0.002	0.074	0.139
Departure Headway (Hd)	4.155	4.214	3.568	4.282
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	0	839	990	839
Service Time	2.203	2.291	1.638	2.3
HCM Lane V/C Ratio	0	0.002	0.075	0.139
HCM Control Delay	7.2	7.3	6.9	8
HCM Lane LOS	N	A	A	A
HCM 95th-tile Q	0	0	0.2	0.5







HCM 6th Signalized Intersection Summary 1: Marlow Rd & Marlow Ct/W Steele Ln

Lance Drive Residential TIA
Existing PM (95-120 Seconds)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (veh/h)	2	0	2	163	4	134	5	623	161	105	707	2
Future Volume (veh/h)	2	0	2	163	4	134	5	623	161	105	707	2
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.96	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	2	0	0	175	0	83	5	656	116	111	744	2
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	42	0	0	1903	0	932	11	738	1164	98	932	3
Arrive On Green	0.02	0.00	0.00	0.54	0.00	0.54	0.01	0.21	0.21	0.06	0.26	0.26
Sat Flow, veh/h	1767	0	0	3534	0	1568	1767	3526	1514	1767	3607	10
Grp Volume(v), veh/h	2	0	0	175	0	83	5	656	116	111	364	382
Grp Sat Flow(s),veh/h/ln	1767	0	0	1767	0	1568	1767	1763	1514	1767	1763	1854
Q Serve(g_s), s	0.1	0.0	0.0	2.6	0.0	0.0	0.3	19.9	2.3	6.1	21.2	21.2
Cycle Q Clear(g_c), s	0.1	0.0	0.0	2.6	0.0	0.0	0.3	19.9	2.3	6.1	21.2	21.2
Prop In Lane	1.00		0.00	1.00		1.00	1.00		1.00	1.00		0.01
Lane Grp Cap(c), veh/h	42	0	0	1903	0	932	11	738	1164	98	456	479
V/C Ratio(X)	0.05	0.00	0.00	0.09	0.00	0.09	0.44	0.89	0.10	1.13	0.80	0.80
Avail Cap(c_a), veh/h	482	0	0	1903	0	932	80	769	1177	98	456	479
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.63	0.63	0.63	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.5	0.0	0.0	12.3	0.0	9.6	54.4	42.2	3.8	52.0	38.1	38.1
Incr Delay (d2), s/veh	0.5	0.0	0.0	0.1	0.0	0.2	15.9	8.1	0.0	131.1	9.7	9.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.0	1.1	0.0	0.9	0.2	9.3	2.6	6.2	10.2	10.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.9	0.0	0.0	12.4	0.0	9.8	70.3	50.3	3.8	183.1	47.8	47.3
LnGrp LOS	D	A	A	B	A	A	E	D	A	F	D	D
Approach Vol, veh/h		2			258			777			857	
Approach Delay, s/veh		52.9			11.6			43.5			65.1	
Approach LOS		D			B			D			E	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		63.8	5.6	33.3		7.2	11.0	27.9				
Change Period (Y+Rc), s		4.6	4.9	4.9		4.6	4.9	4.9				
Max Green Setting (Gmax), s		30.9	5.0	25.1		30.0	6.1	24.0				
Max Q Clear Time (g_c+I1), s		4.6	2.3	23.2		2.1	8.1	21.9				
Green Ext Time (p_c), s		0.9	0.0	0.9		0.0	0.0	1.0				
Intersection Summary												
HCM 6th Ctrl Delay			48.9									
HCM 6th LOS			D									
Notes												
User approved pedestrian interval to be less than phase max green.												
User approved volume balancing among the lanes for turning movement.												

HCM 6th TWSC
2: Iroquois St/Apple Valley Ln & W Steele Ln

Lance Drive Residential TIA
Existing PM (95-120 Seconds)

Intersection												
Int Delay, s/veh	3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	24	278	36	35	438	37	38	4	18	22	9	23
Future Vol, veh/h	24	278	36	35	438	37	38	4	18	22	9	23
Conflicting Peds, #/hr	9	0	9	9	0	9	1	0	2	2	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	60	-	-	80	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	25	293	38	37	461	39	40	4	19	23	9	24






















Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	509	0	0	340	0	0	943	954	323	940	954	491
Stage 1	-	-	-	-	-	-	371	371	-	564	564	-
Stage 2	-	-	-	-	-	-	572	583	-	376	390	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1051	-	-	1214	-	-	242	258	716	243	258	575
Stage 1	-	-	-	-	-	-	647	618	-	509	507	-
Stage 2	-	-	-	-	-	-	503	497	-	643	606	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1042	-	-	1204	-	-	213	240	709	221	240	570
Mov Cap-2 Maneuver	-	-	-	-	-	-	213	240	-	221	240	-
Stage 1	-	-	-	-	-	-	626	598	-	493	487	-
Stage 2	-	-	-	-	-	-	457	477	-	605	586	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.6			0.6			22.2			19.5		
HCM LOS							C			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	272	1042	-	-	1204	-	-	304
HCM Lane V/C Ratio	0.232	0.024	-	-	0.031	-	-	0.187
HCM Control Delay (s)	22.2	8.5	-	-	8.1	-	-	19.5
HCM Lane LOS	C	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.9	0.1	-	-	0.1	-	-	0.7

HCM 6th Signalized Intersection Summary 3: Range Ave & W Steele Ln

Lance Drive Residential TIA
Existing PM (95-120 Seconds)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	307	60	56	416	44	79	191	40	58	418	48
Future Volume (veh/h)	35	307	60	56	416	44	79	191	40	58	418	48
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.96	1.00		0.93
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	36	320	55	58	433	42	82	199	24	60	435	39
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	564	1010	174	641	1093	106	105	455	54	140	564	50
Arrive On Green	0.66	0.66	0.66	0.66	0.66	0.66	0.06	0.14	0.14	0.08	0.17	0.17
Sat Flow, veh/h	911	1538	264	998	1664	161	1767	3158	375	1767	3249	290
Grp Volume(v), veh/h	36	0	375	58	0	475	82	110	113	60	235	239
Grp Sat Flow(s),veh/h/ln	911	0	1802	998	0	1826	1767	1763	1771	1767	1763	1776
Q Serve(g_s), s	1.8	0.0	8.6	2.5	0.0	11.5	4.3	5.4	5.6	3.1	12.1	12.2
Cycle Q Clear(g_c), s	13.3	0.0	8.6	11.1	0.0	11.5	4.3	5.4	5.6	3.1	12.1	12.2
Prop In Lane	1.00		0.15	1.00		0.09	1.00		0.21	1.00		0.16
Lane Grp Cap(c), veh/h	564	0	1184	641	0	1199	105	254	255	140	306	308
V/C Ratio(X)	0.06	0.00	0.32	0.09	0.00	0.40	0.78	0.43	0.44	0.43	0.77	0.78
Avail Cap(c_a), veh/h	564	0	1184	641	0	1199	223	466	468	205	447	450
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.49	0.49	0.49	1.00	1.00	1.00
Uniform Delay (d), s/veh	10.6	0.0	7.1	9.5	0.0	7.6	44.1	37.1	37.2	41.7	37.4	37.5
Incr Delay (d2), s/veh	0.2	0.0	0.7	0.3	0.0	1.0	2.4	0.2	0.2	0.8	2.4	2.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	3.1	0.6	0.0	4.2	1.9	2.3	2.3	1.3	5.2	5.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.9	0.0	7.8	9.8	0.0	8.5	46.5	37.3	37.4	42.5	39.8	40.2
LnGrp LOS	B	A	A	A	A	A	D	D	D	D	D	D
Approach Vol, veh/h		411			533			305			534	
Approach Delay, s/veh		8.0			8.7			39.8			40.3	
Approach LOS		A			A			D			D	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		66.0	8.6	20.4		66.0	11.4	17.6				
Change Period (Y+Rc), s		3.6	3.0	3.9		3.6	3.9	* 3.9				
Max Green Setting (Gmax), s		48.4	12.0	24.1		48.4	11.0	* 25				
Max Q Clear Time (g_c+I1), s		15.3	6.3	14.2		13.5	5.1	7.6				
Green Ext Time (p_c), s		0.8	0.0	0.7		1.1	0.0	0.3				
Intersection Summary												
HCM 6th Ctrl Delay			23.3									
HCM 6th LOS			C									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												











HCM 6th Signalized Intersection Summary

4: Marlow Rd & Guerneville Rd

Lance Drive Residential TIA

Existing PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	166	394	117	254	445	109	130	599	153	64	700	67
Future Volume (veh/h)	166	394	117	254	445	109	130	599	153	64	700	67
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	175	415	66	267	468	95	137	631	81	67	737	65
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	186	612	393	235	599	121	141	796	557	221	887	78
Arrive On Green	0.11	0.17	0.17	0.13	0.21	0.21	0.08	0.23	0.23	0.13	0.27	0.27
Sat Flow, veh/h	1767	3526	1536	1767	2909	586	1767	3526	1537	1767	3271	288
Grp Volume(v), veh/h	175	415	66	267	282	281	137	631	81	67	397	405
Grp Sat Flow(s),veh/h/ln	1767	1763	1536	1767	1763	1733	1767	1763	1537	1767	1763	1797
Q Serve(g_s), s	9.3	10.5	1.4	12.6	14.4	14.6	7.3	16.0	0.0	3.3	20.1	20.2
Cycle Q Clear(g_c), s	9.3	10.5	1.4	12.6	14.4	14.6	7.3	16.0	0.0	3.3	20.1	20.2
Prop In Lane	1.00		1.00	1.00		0.34	1.00		1.00	1.00		0.16
Lane Grp Cap(c), veh/h	186	612	393	235	363	357	141	796	557	221	478	487
V/C Ratio(X)	0.94	0.68	0.17	1.13	0.78	0.79	0.97	0.79	0.15	0.30	0.83	0.83
Avail Cap(c_a), veh/h	186	1006	564	235	479	471	141	1054	669	221	557	567
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.97	0.97	0.97	0.48	0.48	0.48	0.70	0.70	0.70
Uniform Delay (d), s/veh	42.2	36.8	7.2	41.2	35.7	35.8	43.6	34.7	20.6	37.8	32.6	32.6
Incr Delay (d2), s/veh	49.1	1.3	0.2	98.9	14.7	15.6	43.9	1.5	0.1	0.5	6.6	6.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.5	4.5	0.8	11.8	7.4	7.4	4.8	6.7	1.2	1.4	9.1	9.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	91.3	38.1	7.4	140.1	50.4	51.3	87.5	36.2	20.6	38.3	39.1	39.1
LnGrp LOS	F	D	A	F	D	D	F	D	C	D	D	D
Approach Vol, veh/h	656					830		849		869		
Approach Delay, s/veh	49.2					79.6		43.0		39.0		
Approach LOS	D					E		D		D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	22.2	12.9	31.1	15.3	25.3	17.2	26.8					
Change Period (Y+Rc), s	5.7	* 5.7	5.3	5.3	5.3	5.7	5.3	5.3				
Max Green Setting (Gmax), s	27	* 27	7.6	30.0	10.0	25.8	9.2	28.4				
Max Q Clear Time (g_c+14.6), s	12.5	12.5	9.3	22.2	11.3	16.6	5.3	18.0				
Green Ext Time (p_c), s	0.0	2.4	0.0	3.0	0.0	2.2	0.0	3.1				

Intersection Summary

HCM 6th Ctrl Delay 52.7

HCM 6th LOS D

Notes







User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary 5: Ridley Ave & Guerneville Rd

Lance Drive Residential TIA
Existing PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	609	33	62	777	2	14	0	39	3	0	8
Future Volume (veh/h)	5	609	33	62	777	2	14	0	39	3	0	8
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	0.99		0.98	0.99		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	5	655	26	67	835	2	15	0	2	3	0	0
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	658	3091	123	731	3227	8	113	0	6	126	0	0
Arrive On Green	0.89	0.89	0.89	1.00	1.00	1.00	0.03	0.00	0.03	0.03	0.00	0.00
Sat Flow, veh/h	651	3456	137	753	3608	9	1259	0	168	1517	0	0
Grp Volume(v), veh/h	5	334	347	67	408	429	17	0	0	3	0	0
Grp Sat Flow(s),veh/h/ln	651	1763	1830	753	1763	1854	1427	0	0	1518	0	0
Q Serve(g_s), s	0.1	2.3	2.3	0.3	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.1	2.3	2.3	2.6	0.0	0.0	1.1	0.0	0.0	0.2	0.0	0.0
Prop In Lane	1.00		0.07	1.00		0.00	0.88		0.12	1.00		0.00
Lane Grp Cap(c), veh/h	658	1576	1637	731	1576	1658	118	0	0	126	0	0
V/C Ratio(X)	0.01	0.21	0.21	0.09	0.26	0.26	0.14	0.00	0.00	0.02	0.00	0.00
Avail Cap(c_a), veh/h	658	1576	1637	731	1576	1658	502	0	0	505	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.93	0.93	0.93	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.5	0.7	0.7	0.0	0.0	0.0	44.9	0.0	0.0	44.5	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.3	0.3	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.1	0.1	0.0	0.0	0.0	0.4	0.0	0.0	0.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.6	0.9	0.9	0.1	0.0	0.0	45.1	0.0	0.0	44.5	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	D	A	A	D	A	A
Approach Vol, veh/h	686					904		17		3		
Approach Delay, s/veh	0.9					0.0		45.1		44.5		
Approach LOS	A					A		D		D		
Timer - Assigned Phs	2		4			6		8				
Phs Duration (G+Y+Rc), s	88.9		6.1			88.9		6.1				
Change Period (Y+Rc), s	3.9		3.0			3.9		3.0				
Max Green Setting (Gmax), s	59.1		29.0			59.1		29.0				
Max Q Clear Time (g_c+I1), s	4.3		2.2			4.6		3.1				
Green Ext Time (p_c), s	1.3		0.0			1.8		0.0				
Intersection Summary												
HCM 6th Ctrl Delay			1.0									
HCM 6th LOS			A									

HCM 6th Signalized Intersection Summary

6: Lance Dr & Guerneville Rd

Lance Drive Residential TIA

Existing PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	562	11	53	842	97	4	25	37	43	32	28
Future Volume (veh/h)	50	562	11	53	842	97	4	25	37	43	32	28
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	0.99		0.99	0.99		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	52	585	10	55	877	83	4	26	4	45	33	17
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	83	647	11	238	952	414	50	148	21	116	69	28
Arrive On Green	0.09	0.36	0.36	0.18	0.36	0.36	0.10	0.10	0.10	0.10	0.10	0.10
Sat Flow, veh/h	1767	3545	61	1767	3526	1535	82	1491	210	602	694	282
Grp Volume(v), veh/h	52	291	304	55	877	83	34	0	0	95	0	0
Grp Sat Flow(s), veh/h/ln	1767	1763	1843	1767	1763	1535	1783	0	0	1578	0	0
Q Serve(g_s), s	2.7	14.9	14.9	2.5	22.6	3.5	0.0	0.0	0.0	3.7	0.0	0.0
Cycle Q Clear(g_c), s	2.7	14.9	14.9	2.5	22.6	3.5	1.6	0.0	0.0	5.4	0.0	0.0
Prop In Lane	1.00		0.03	1.00		1.00	0.12		0.12	0.47		0.18
Lane Grp Cap(c), veh/h	83	322	336	238	952	414	219	0	0	213	0	0
V/C Ratio(X)	0.62	0.90	0.91	0.23	0.92	0.20	0.15	0.00	0.00	0.45	0.00	0.00
Avail Cap(c_a), veh/h	162	737	770	238	1473	641	621	0	0	567	0	0
HCM Platoon Ratio	2.00	2.00	2.00	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.92	0.92	0.92	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	42.2	29.4	29.4	34.8	29.5	23.4	39.3	0.0	0.0	40.9	0.0	0.0
Incr Delay (d2), s/veh	2.8	3.9	3.8	0.2	14.5	1.0	0.1	0.0	0.0	0.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	5.1	5.3	1.1	10.1	1.3	0.7	0.0	0.0	2.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.0	33.3	33.2	34.9	44.0	24.4	39.4	0.0	0.0	41.4	0.0	0.0
LnGrp LOS	D	C	C	C	D	C	D	A	A	D	A	A
Approach Vol, veh/h	647			1015			34			95		
Approach Delay, s/veh	34.2			41.9			39.4			41.4		
Approach LOS	C			D			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	22.6			14.0	9.8	30.9		14.0				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		4.6				
Max Green Setting (Gmax), s	39.7			31.4	8.7	39.7		31.4				
Max Q Clear Time (g_c+14), s	16.9			7.4	4.7	24.6		3.6				
Green Ext Time (p_c), s	0.0	0.5		0.1	0.0	1.0		0.0				

Intersection Summary

HCM 6th Ctrl Delay 39.0

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

7: N Dutton Ave/Westberry Dr & Guerneville Rd

Lance Drive Residential TIA
Existing PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	601	94	440	808	17	150	4	429	6	4	4
Future Volume (veh/h)	3	601	94	440	808	17	150	4	429	6	4	4
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	3	646	95	473	869	17	164	0	123	6	4	0
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	8	719	106	1598	2457	48	212	0	826	26	17	0
Arrive On Green	0.00	0.23	0.23	0.47	0.70	0.70	0.06	0.00	0.06	0.02	0.02	0.00
Sat Flow, veh/h	1767	3073	451	3428	3535	69	3534	0	1557	1081	721	0
Grp Volume(v), veh/h	3	370	371	473	433	453	164	0	123	10	0	0
Grp Sat Flow(s), veh/h/ln	1767	1763	1762	1714	1763	1841	1767	0	1557	1801	0	0
Q Serve(g_s), s	0.2	19.3	19.4	8.1	9.4	9.4	4.3	0.0	0.0	0.5	0.0	0.0
Cycle Q Clear(g_c), s	0.2	19.3	19.4	8.1	9.4	9.4	4.3	0.0	0.0	0.5	0.0	0.0
Prop In Lane	1.00		0.26	1.00		0.04	1.00		1.00	0.60		0.00
Lane Grp Cap(c), veh/h	8	412	412	1598	1226	1280	212	0	826	44	0	0
V/C Ratio(X)	0.35	0.90	0.90	0.30	0.35	0.35	0.77	0.00	0.15	0.23	0.00	0.00
Avail Cap(c_a), veh/h	112	471	471	1598	1226	1280	212	0	826	525	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.98	0.98	0.98	0.73	0.73	0.73	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	47.1	35.3	35.3	15.7	5.9	5.9	44.0	0.0	11.6	45.5	0.0	0.0
Incr Delay (d2), s/veh	8.8	24.5	24.8	0.0	0.6	0.6	14.8	0.0	0.0	1.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	10.7	10.8	3.0	2.9	3.0	2.3	0.0	1.2	0.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.9	59.8	60.1	15.7	6.4	6.4	58.8	0.0	11.6	46.5	0.0	0.0
LnGrp LOS	E	E	E	B	A	A	E	A	B	D	A	A
Approach Vol, veh/h	744			1359			287			10		
Approach Delay, s/veh	59.9			9.7			38.6			46.5		
Approach LOS	E			A			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	49.6	27.5		6.9	5.8	71.3		11.0				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		5.3				
Max Green Setting (Gmax), s	45.3	25.4		27.7	6.0	35.1		5.7				
Max Q Clear Time (g_c+I10, s)	11.0	21.4		2.5	2.2	11.4		6.3				
Green Ext Time (p_c), s	0.1	0.4		0.0	0.0	0.7		0.0				

Intersection Summary

HCM 6th Ctrl Delay 28.9

HCM 6th LOS C

Notes








User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

8: Herbert St/Coffey Ln & Guerneville Rd

Lance Drive Residential TIA
Existing PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	162	812	52	48	1036	88	37	20	28	97	23	217
Future Volume (veh/h)	162	812	52	48	1036	88	37	20	28	97	23	217
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.99	1.00		0.93	1.00		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	176	883	54	52	1126	91	40	22	14	105	25	69
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	149	940	57	605	1773	143	80	44	28	167	40	305
Arrive On Green	0.08	0.28	0.28	0.34	0.54	0.54	0.09	0.09	0.09	0.12	0.12	0.12
Sat Flow, veh/h	1767	3365	206	1767	3301	267	908	499	318	1441	343	1484
Grp Volume(v), veh/h	176	463	474	52	601	616	76	0	0	130	0	69
Grp Sat Flow(s),veh/h/ln	1767	1763	1808	1767	1763	1805	1725	0	0	1784	0	1484
Q Serve(g_s), s	9.7	29.5	29.5	2.3	27.5	27.6	4.8	0.0	0.0	8.0	0.0	4.5
Cycle Q Clear(g_c), s	9.7	29.5	29.5	2.3	27.5	27.6	4.8	0.0	0.0	8.0	0.0	4.5
Prop In Lane	1.00		0.11	1.00		0.15	0.53		0.18	0.81		1.00
Lane Grp Cap(c), veh/h	149	492	505	605	947	969	152	0	0	207	0	305
V/C Ratio(X)	1.18	0.94	0.94	0.09	0.63	0.64	0.50	0.00	0.00	0.63	0.00	0.23
Avail Cap(c_a), veh/h	149	581	596	605	947	969	375	0	0	403	0	468
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.86	0.86	0.86	0.85	0.85	0.85	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	52.7	40.5	40.5	25.6	18.7	18.7	50.0	0.0	0.0	48.5	0.0	38.6
Incr Delay (d2), s/veh	125.4	25.3	24.9	0.0	2.8	2.7	1.0	0.0	0.0	1.2	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	15.8	16.1	1.0	11.2	11.4	2.1	0.0	0.0	3.6	0.0	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	178.0	65.8	65.4	25.7	21.5	21.4	51.0	0.0	0.0	49.7	0.0	38.7
LnGrp LOS	F	E	E	C	C	C	D	A	A	D	A	D
Approach Vol, veh/h	1113		1269				76		199			
Approach Delay, s/veh	83.4		21.6				51.0		45.9			
Approach LOS	F		C				D		D			
Timer - Assigned Phs	1	2	4		5	6	8					
Phs Duration (G+Y+Rc), s	44.6	37.4	18.2		15.0	67.1	14.7					
Change Period (Y+Rc), s	5.3	5.3	4.9		5.3	5.3	4.6					
Max Green Setting (Gmax), s	60.0	37.9	26.0		9.7	34.2	25.0					
Max Q Clear Time (g_c+14.3), s	14.3	31.5	10.0		11.7	29.6	6.8					
Green Ext Time (p_c), s	0.0	0.6	0.1		0.0	0.8	0.1					
Intersection Summary												
HCM 6th Ctrl Delay	50.1											
HCM 6th LOS	D											

HCM 6th Signalized Intersection Summary

9: Range Ave & Guerneville Rd

Lance Drive Residential TIA
Existing PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	145	572	196	81	696	14	268	151	134	82	217	235
Future Volume (veh/h)	145	572	196	81	696	14	268	151	134	82	217	235
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.93
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No		No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	151	596	0	84	725	0	173	306	83	85	226	84
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	532	1705		107	856		294	467	124	130	183	65
Arrive On Green	0.30	0.48	0.00	0.06	0.24	0.00	0.17	0.17	0.17	0.02	0.02	0.02
Sat Flow, veh/h	1767	3618	0	1767	3618	0	1767	2808	746	1767	2490	886
Grp Volume(v), veh/h	151	596	0	84	725	0	173	200	189	85	157	153
Grp Sat Flow(s),veh/h/ln	1767	1763	0	1767	1763	0	1767	1856	1698	1767	1763	1613
Q Serve(g_s), s	6.2	10.0	0.0	4.5	18.6	0.0	8.6	9.6	9.9	4.5	7.0	7.0
Cycle Q Clear(g_c), s	6.2	10.0	0.0	4.5	18.6	0.0	8.6	9.6	9.9	4.5	7.0	7.0
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.44	1.00		0.55
Lane Grp Cap(c), veh/h	532	1705		107	856		294	309	283	130	130	119
V/C Ratio(X)	0.28	0.35		0.79	0.85		0.59	0.65	0.67	0.65	1.21	1.29
Avail Cap(c_a), veh/h	532	1705		112	1058		614	645	590	130	130	119
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	0.82	0.82	0.00	0.95	0.95	0.00	1.00	1.00	1.00	0.62	0.62	0.62
Uniform Delay (d), s/veh	25.4	15.2	0.0	44.0	34.3	0.0	36.6	37.0	37.1	45.1	46.3	46.3
Incr Delay (d2), s/veh	0.1	0.5	0.0	25.2	4.4	0.0	0.7	0.9	1.0	5.6	130.0	162.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	3.8	0.0	2.7	8.2	0.0	3.7	4.4	4.1	2.2	7.8	8.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.5	15.7	0.0	69.3	38.6	0.0	37.3	37.8	38.1	50.8	176.3	208.9
LnGrp LOS	C	B		E	D		D	D	D	D	F	F
Approach Vol, veh/h	747		A		809		A		562		395	
Approach Delay, s/veh	17.7				41.8				37.8		161.9	
Approach LOS	B				D				D		F	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.1	51.2		12.3	33.9	28.4		20.4				
Change Period (Y+Rc), s	5.3	5.3		5.3	5.3	5.3		4.6				
Max Green Setting (Gmax), s	6.0	28.5		7.0	6.0	28.5		33.0				
Max Q Clear Time (g_c+10), s	10.5	12.0		9.0	8.2	20.6		11.9				
Green Ext Time (p_c), s	0.0	0.7		0.0	0.0	0.8		0.3				

Intersection Summary

HCM 6th Ctrl Delay 52.6

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.












User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary 10: Guerneville Rd & Steele Wy

Lance Drive Residential TIA
Existing PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	674	98	128	713	8	61	34	156	311	48	17
Future Volume (veh/h)	16	674	98	128	713	8	61	34	156	311	48	17
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No				No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	16	688	69	131	728	7	48	54	70	352	0	5
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	690	1940	982	218	799	8	145	152	226	454	0	810
Arrive On Green	0.39	0.55	0.55	0.06	0.22	0.22	0.08	0.08	0.08	0.13	0.00	0.13
Sat Flow, veh/h	1767	3526	1550	3428	3577	34	1767	1856	1532	3534	0	1526
Grp Volume(v), veh/h	16	688	69	131	359	376	48	54	70	352	0	5
Grp Sat Flow(s),veh/h/ln	1767	1763	1550	1714	1763	1849	1767	1856	1532	1767	0	1526
Q Serve(g_s), s	0.6	12.0	1.9	4.1	21.8	21.8	2.8	3.0	4.5	10.6	0.0	0.0
Cycle Q Clear(g_c), s	0.6	12.0	1.9	4.1	21.8	21.8	2.8	3.0	4.5	10.6	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.02	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	690	1940	982	218	394	413	145	152	226	454	0	810
V/C Ratio(X)	0.02	0.35	0.07	0.60	0.91	0.91	0.33	0.35	0.31	0.77	0.00	0.01
Avail Cap(c_a), veh/h	690	1940	982	221	476	499	434	455	476	868	0	989
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.86	0.86	0.86	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	20.6	13.8	7.8	50.1	41.7	41.7	47.6	47.7	42.1	46.4	0.0	12.8
Incr Delay (d2), s/veh	0.0	0.4	0.1	3.0	17.7	17.1	0.5	0.5	0.3	1.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	4.7	0.8	1.8	11.2	11.7	1.3	1.4	1.7	4.7	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.6	14.3	7.9	53.2	59.4	58.8	48.1	48.2	42.3	47.5	0.0	12.8
LnGrp LOS	C	B	A	D	E	E	D	D	D	D	A	B
Approach Vol, veh/h	773		866				172				357	
Approach Delay, s/veh	13.8		58.2				45.8				47.0	
Approach LOS	B		E				D				D	
Timer - Assigned Phs	1	2	4		5	6	8					
Phs Duration (G+Y+Rc), s	1.9	65.4	19.0		47.9	29.5	13.6					
Change Period (Y+Rc), s	4.9	4.9	4.9		4.9	4.9	4.6					
Max Green Setting (Gmax), s	29.6		27.0		7.0	29.7	27.0					
Max Q Clear Time (g_c+10), s	14.0		12.6		2.6	23.8	6.5					
Green Ext Time (p_c), s	0.0	0.9	0.1		0.0	0.5	0.0					

Intersection Summary

HCM 6th Ctrl Delay 39.5

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

11: Cleveland Ave & Guerneville Rd

Lance Drive Residential TIA
Existing PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	RT	LT	RT	RT	LT	RT	RT	LT	RT	RT	LT	RT
Traffic Volume (veh/h)	110	983	74	302	1130	197	85	130	227	405	340	111
Future Volume (veh/h)	110	983	74	302	1130	197	85	130	227	405	340	111
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.98	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	115	1024	68	315	1177	129	89	135	68	292	536	99
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	240	1483	98	385	1228	536	293	381	181	370	636	117
Arrive On Green	0.07	0.31	0.31	0.04	0.11	0.11	0.17	0.17	0.17	0.21	0.21	0.21
Sat Flow, veh/h	3428	4844	321	3428	3526	1538	1767	2301	1092	1767	3033	558
Grp Volume(v), veh/h	115	713	379	315	1177	129	89	101	102	292	327	308
Grp Sat Flow(s), veh/h/ln	1714	1689	1788	1714	1763	1538	1767	1763	1630	1767	1856	1735
Q Serve(g_s), s	3.1	17.7	17.7	8.7	31.5	7.3	4.2	4.8	5.3	14.9	16.1	16.2
Cycle Q Clear(g_c), s	3.1	17.7	17.7	8.7	31.5	7.3	4.2	4.8	5.3	14.9	16.1	16.2
Prop In Lane	1.00		0.18	1.00		1.00	1.00		0.67	1.00		0.32
Lane Grp Cap(c), veh/h	240	1034	547	385	1228	536	293	292	270	370	389	364
V/C Ratio(X)	0.48	0.69	0.69	0.82	0.96	0.24	0.30	0.35	0.38	0.79	0.84	0.85
Avail Cap(c_a), veh/h	253	1034	547	422	1228	536	293	292	270	502	527	493
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.51	0.51	0.51	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.5	29.0	29.0	44.8	41.4	30.6	34.8	35.1	35.3	35.5	36.0	36.1
Incr Delay (d2), s/veh	0.5	1.6	3.1	5.3	10.2	0.0	2.7	3.3	4.0	4.0	6.7	7.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	7.1	7.8	4.1	16.5	2.8	2.0	2.3	2.4	6.6	7.8	7.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.0	30.6	32.1	50.1	51.6	30.6	37.5	38.3	39.2	39.5	42.7	43.7
LnGrp LOS	D	C	C	D	D	C	D	D	D	D	D	D
Approach Vol, veh/h	1207			1621			292			927		
Approach Delay, s/veh	32.3			49.6			38.4			42.1		
Approach LOS	C			D			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.6	34.0		20.6	11.6	38.0		24.8				
Change Period (Y+Rc), s	4.9	4.9		4.9	4.9	4.9		4.9				
Max Green Setting (Gmax), s	11.3	28.4		8.3	7.0	33.1		27.0				
Max Q Clear Time (g_c+I10), s	19.7			7.3	5.1	33.5		18.2				
Green Ext Time (p_c), s	0.0	1.2		0.0	0.0	0.0		0.5				

Intersection Summary

HCM 6th Ctrl Delay 41.9
HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.
User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

12: US 101 SB Ramps & Guerneville Rd

Lance Drive Residential TIA
Existing PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑					↑	↑	↑
Traffic Volume (veh/h)	0	1103	538	291	1343	0	0	0	0	289	63	300
Future Volume (veh/h)	0	1103	538	291	1343	0	0	0	0	289	63	300
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1856	1856	1856	1856	0				1856	1856	1856
Adj Flow Rate, veh/h	0	1137	230	300	1385	0				344	0	270
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	1320	394	367	1477	0				1700	0	756
Arrive On Green	0.00	0.26	0.26	0.11	0.42	0.00				0.48	0.00	0.48
Sat Flow, veh/h	0	5233	1511	3428	3618	0				3534	0	1572
Grp Volume(v), veh/h	0	1137	230	300	1385	0				344	0	270
Grp Sat Flow(s),veh/h/ln	0	1689	1511	1714	1763	0				1767	0	1572
Q Serve(g_s), s	0.0	20.3	12.6	8.1	35.7	0.0				5.3	0.0	10.2
Cycle Q Clear(g_c), s	0.0	20.3	12.6	8.1	35.7	0.0				5.3	0.0	10.2
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1320	394	367	1477	0				1700	0	756
V/C Ratio(X)	0.00	0.86	0.58	0.82	0.94	0.00				0.20	0.00	0.36
Avail Cap(c_a), veh/h	0	1925	574	516	2052	0				1700	0	756
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.58	0.58	0.74	0.74	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	33.5	30.6	41.5	26.4	0.0				14.2	0.0	15.5
Incr Delay (d2), s/veh	0.0	1.2	0.3	3.6	4.7	0.0				0.3	0.0	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	8.2	4.5	3.5	14.9	0.0				2.0	0.0	3.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	34.7	30.9	45.1	31.1	0.0				14.4	0.0	16.8
LnGrp LOS	A	C	C	D	C	A				B	A	B
Approach Vol, veh/h		1367			1685						614	
Approach Delay, s/veh		34.0			33.6						15.5	
Approach LOS		C			C						B	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	5.1	29.7		50.3		44.7						
Change Period (Y+Rc), s	4.9	4.9		4.6		4.9						
Max Green Setting (Gmax), s	4.3	36.1		30.2		55.3						
Max Q Clear Time (g_c+I10, s)	11.0	22.3		12.2		37.7						
Green Ext Time (p_c), s	0.0	1.6		0.1		2.1						

Intersection Summary

HCM 6th Ctrl Delay 30.7
HCM 6th LOS C

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 13: US 101 NB Ramps & Guerneville Rd/Steele Ln

Lance Drive Residential TIA
Existing PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↑↑			↑↑↑		↰	↰↱	↰			
Traffic Volume (veh/h)	376	1016	0	0	983	232	651	1	329	0	0	0
Future Volume (veh/h)	376	1016	0	0	983	232	651	1	329	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1856	1856	0	0	1856	1856	1856	1856	1856			
Adj Flow Rate, veh/h	392	1058	0	0	1024	214	751	0	156			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	3	3	0	0	3	3	3	3	3			
Cap, veh/h	1186	2362	0	0	1139	238	813	0	362			
Arrive On Green	0.69	1.00	0.00	0.00	0.27	0.27	0.23	0.00	0.23			
Sat Flow, veh/h	3428	3618	0	0	4347	872	3534	0	1572			
Grp Volume(v), veh/h	392	1058	0	0	827	411	751	0	156			
Grp Sat Flow(s),veh/h/ln	1714	1763	0	0	1689	1674	1767	0	1572			
Q Serve(g_s), s	4.3	0.0	0.0	0.0	22.4	22.5	19.7	0.0	8.1			
Cycle Q Clear(g_c), s	4.3	0.0	0.0	0.0	22.4	22.5	19.7	0.0	8.1			
Prop In Lane	1.00		0.00	0.00		0.52	1.00		1.00			
Lane Grp Cap(c), veh/h	1186	2362	0	0	920	456	813	0	362			
V/C Ratio(X)	0.33	0.45	0.00	0.00	0.90	0.90	0.92	0.00	0.43			
Avail Cap(c_a), veh/h	1186	2362	0	0	1177	583	1168	0	520			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.62	0.62	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	10.2	0.0	0.0	0.0	33.3	33.3	35.8	0.0	31.3			
Incr Delay (d2), s/veh	0.0	0.4	0.0	0.0	6.9	12.7	7.6	0.0	0.3			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	1.4	0.1	0.0	0.0	9.7	10.4	8.8	0.0	2.9			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.3	0.4	0.0	0.0	40.1	46.1	43.3	0.0	31.6			
LnGrp LOS	B	A	A	A	D	D	D	A	C			
Approach Vol, veh/h	1450			1238			907					
Approach Delay, s/veh	3.1			42.1			41.3					
Approach LOS	A			D			D					
Timer - Assigned Phs	2			5			6			8		
Phs Duration (G+Y+Rc), s	68.6			37.8			30.8			26.4		
Change Period (Y+Rc), s	4.9			4.9			4.9			4.6		
Max Green Setting (Gmax), s	54.1			16.1			33.1			31.4		
Max Q Clear Time (g_c+I1), s	2.0			6.3			24.5			21.7		
Green Ext Time (p_c), s	1.5			0.1			1.4			0.1		

Intersection Summary

HCM 6th Ctrl Delay	26.2
HCM 6th LOS	C

Notes










User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

14: Stony Point Rd/Marlow Rd & W College Ave

Lance Drive Residential TIA
Existing PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	63	236	104	211	331	191	153	738	248	152	803	100
Future Volume (veh/h)	63	236	104	211	331	191	153	738	248	152	803	100
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	66	248	66	222	348	133	161	777	128	160	845	96
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	382	364	95	492	486	182	173	880	823	206	855	97
Arrive On Green	0.22	0.13	0.13	0.28	0.19	0.19	0.10	0.25	0.25	0.12	0.27	0.27
Sat Flow, veh/h	1767	2756	716	1767	2495	936	1767	3526	1543	1767	3184	362
Grp Volume(v), veh/h	66	157	157	222	244	237	161	777	128	160	468	473
Grp Sat Flow(s),veh/h/ln	1767	1763	1710	1767	1763	1669	1767	1763	1543	1767	1763	1783
Q Serve(g_s), s	2.9	8.0	8.4	9.9	12.3	12.7	8.6	20.2	1.6	8.4	25.1	25.1
Cycle Q Clear(g_c), s	2.9	8.0	8.4	9.9	12.3	12.7	8.6	20.2	1.6	8.4	25.1	25.1
Prop In Lane	1.00		0.42	1.00		0.56	1.00		1.00	1.00		0.20
Lane Grp Cap(c), veh/h	382	233	226	492	343	325	173	880	823	206	473	479
V/C Ratio(X)	0.17	0.67	0.70	0.45	0.71	0.73	0.93	0.88	0.16	0.78	0.99	0.99
Avail Cap(c_a), veh/h	382	482	468	492	542	513	173	931	845	206	473	479
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.48	0.48	0.48	1.00	1.00	1.00	0.50	0.50	0.50
Uniform Delay (d), s/veh	30.3	39.3	39.4	28.3	35.8	35.9	42.5	34.3	3.4	40.7	34.6	34.6
Incr Delay (d2), s/veh	0.2	3.3	3.8	0.3	1.3	1.5	48.6	9.7	0.1	8.9	26.4	26.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	3.6	3.6	4.0	5.2	5.1	6.0	9.4	0.6	4.0	13.6	13.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.5	42.6	43.2	28.6	37.1	37.5	91.2	44.0	3.5	49.7	61.0	60.9
LnGrp LOS	C	D	D	C	D	D	F	D	A	D	E	E
Approach Vol, veh/h	380				703		1066				1101	
Approach Delay, s/veh	40.8				34.5		46.2				59.3	
Approach LOS	D				C		D				E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	17.9	17.9	14.6	30.8	25.8	23.8	16.4	29.0				
Change Period (Y+Rc), s	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3				
Max Green Setting (Gmax), s	26.0	26.0	9.3	25.5	9.8	29.2	9.7	25.1				
Max Q Clear Time (g_c+I1), s	10.4	10.4	10.6	27.1	4.9	14.7	10.4	22.2				
Green Ext Time (p_c), s	0.1	1.5	0.0	0.0	0.0	2.3	0.0	1.5				

Intersection Summary

HCM 6th Ctrl Delay 47.5

HCM 6th LOS D

Notes









User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

15: N Dutton Ave & W College Ave

Lance Drive Residential TIA
Existing PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	76	558	96	180	747	156	134	314	124	288	483	132
Future Volume (veh/h)	76	558	96	180	747	156	134	314	124	288	483	132
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	79	581	88	188	778	144	140	327	95	300	503	118
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	101	653	99	220	859	159	496	419	119	622	640	149
Arrive On Green	0.06	0.21	0.21	0.12	0.29	0.29	0.28	0.16	0.16	0.35	0.23	0.23
Sat Flow, veh/h	1767	3063	463	1767	2961	548	1767	2692	768	1767	2825	659
Grp Volume(v), veh/h	79	334	335	188	463	459	140	212	210	300	313	308
Grp Sat Flow(s),veh/h/ln	1767	1763	1763	1767	1763	1747	1767	1763	1698	1767	1763	1721
Q Serve(g_s), s	4.2	17.5	17.6	9.9	24.0	24.0	5.9	11.0	11.3	12.6	15.8	16.0
Cycle Q Clear(g_c), s	4.2	17.5	17.6	9.9	24.0	24.0	5.9	11.0	11.3	12.6	15.8	16.0
Prop In Lane	1.00		0.26	1.00		0.31	1.00		0.45	1.00		0.38
Lane Grp Cap(c), veh/h	101	376	376	220	511	507	496	274	264	622	399	390
V/C Ratio(X)	0.78	0.89	0.89	0.85	0.91	0.91	0.28	0.77	0.80	0.48	0.78	0.79
Avail Cap(c_a), veh/h	130	429	429	260	559	553	496	408	393	622	501	489
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.82	0.82	0.82	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.2	36.3	36.3	40.7	32.5	32.5	26.7	38.5	38.7	24.0	34.5	34.6
Incr Delay (d2), s/veh	12.9	14.4	14.9	18.3	16.6	16.8	0.1	2.5	3.6	0.2	4.8	5.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	8.8	8.9	5.3	12.2	12.1	2.4	4.8	4.9	5.0	7.0	7.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.1	50.6	51.2	59.0	49.1	49.2	26.8	41.1	42.3	24.2	39.3	39.9
LnGrp LOS	E	D	D	E	D	D	C	D	D	C	D	D
Approach Vol, veh/h	748				1110				562		921	
Approach Delay, s/veh	51.6				50.8				38.0		34.6	
Approach LOS	D				D				D		C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), \$5.7	24.2	29.7	25.4	8.4	31.5	36.4	18.7					
Change Period (Y+Rc), s	3.9	* 3.9	3.0	3.9	3.0	3.9	3.0	3.9				
Max Green Setting (Gmax),s	4.0	* 23	17.1	27.0	7.0	30.1	22.1	22.0				
Max Q Clear Time (g_c+I1),s	11.9	19.6	7.9	18.0	6.2	26.0	14.6	13.3				
Green Ext Time (p_c), s	0.0	0.6	0.0	0.9	0.0	1.0	0.1	0.6				

Intersection Summary

HCM 6th Ctrl Delay 44.4

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection

Intersection Delay, s/veh 7.2

Intersection LOS A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	0	0	0	73	0	0	0	61	0	0
Future Vol, veh/h	0	0	0	0	0	73	0	0	0	61	0	0
Peak Hour Factor	0.86	0.86	0.92	0.92	0.86	0.86	0.92	0.92	0.92	0.86	0.92	0.86
Heavy Vehicles, %	3	3	2	2	3	3	2	2	2	3	2	3
Mvmt Flow	0	0	0	0	0	85	0	0	0	71	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0





















Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	0	6.8	0	7.7
HCM LOS	-	A	-	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	0%	0%	100%
Vol Thru, %	100%	100%	0%	0%
Vol Right, %	0%	0%	100%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	0	0	73	61
LT Vol	0	0	0	61
Through Vol	0	0	0	0
RT Vol	0	0	73	0
Lane Flow Rate	0	0	85	71
Geometry Grp	1	1	1	1
Degree of Util (X)	0	0	0.082	0.085
Departure Headway (Hd)	4.136	4.14	3.474	4.299
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	0	0	1025	836
Service Time	2.17	2.19	1.517	2.313
HCM Lane V/C Ratio	0	0	0.083	0.085
HCM Control Delay	7.2	7.2	6.8	7.7
HCM Lane LOS	N	N	A	A
HCM 95th-tile Q	0	0	0.3	0.3

HCM 6th Signalized Intersection Summary







1: Marlow Rd & Marlow Ct/W Steele Ln

Lance Drive Residential TIA
Existing PM (120 Seconds)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	0	2	163	4	134	5	623	161	105	707	2
Future Volume (veh/h)	2	0	2	163	4	134	5	623	161	105	707	2
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.96	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	2	0	0	175	0	83	5	656	116	111	744	2
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	25	0	0	1853	0	946	11	793	1165	139	1072	3
Arrive On Green	0.01	0.00	0.00	0.52	0.00	0.52	0.01	0.22	0.22	0.08	0.30	0.30
Sat Flow, veh/h	1767	0	0	3534	0	1568	1767	3526	1516	1767	3607	10
Grp Volume(v), veh/h	2	0	0	175	0	83	5	656	116	111	364	382
Grp Sat Flow(s),veh/h/ln	1767	0	0	1767	0	1568	1767	1763	1516	1767	1763	1854
Q Serve(g_s), s	0.1	0.0	0.0	3.0	0.0	0.0	0.3	21.3	2.5	7.4	21.9	21.9
Cycle Q Clear(g_c), s	0.1	0.0	0.0	3.0	0.0	0.0	0.3	21.3	2.5	7.4	21.9	21.9
Prop In Lane	1.00		0.00	1.00		1.00	1.00		1.00	1.00		0.01
Lane Grp Cap(c), veh/h	25	0	0	1853	0	946	11	793	1165	139	524	551
V/C Ratio(X)	0.08	0.00	0.00	0.09	0.00	0.09	0.44	0.83	0.10	0.80	0.69	0.69
Avail Cap(c_a), veh/h	227	0	0	1853	0	946	149	1031	1268	517	883	928
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.66	0.66	0.66	1.00	1.00	1.00
Uniform Delay (d), s/veh	58.4	0.0	0.0	14.3	0.0	10.0	59.4	44.3	4.1	54.3	37.3	37.3
Incr Delay (d2), s/veh	1.4	0.0	0.0	0.1	0.0	0.2	16.9	3.0	0.0	10.0	1.7	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.0	1.2	0.0	0.9	0.2	9.5	2.9	3.7	9.6	10.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.8	0.0	0.0	14.4	0.0	10.2	76.3	47.3	4.1	64.3	39.0	38.9
LnGrp LOS	E	A	A	B	A	B	E	D	A	E	D	D
Approach Vol, veh/h	2			258			777			857		
Approach Delay, s/veh	59.8			13.0			41.0			42.3		
Approach LOS	E			B			D			D		
Timer - Assigned Phs	2		3	4		6		7	8			
Phs Duration (G+Y+Rc), s	67.5		5.7	40.6		6.3		14.3	31.9			
Change Period (Y+Rc), s	4.6		4.9	4.9		4.6		4.9	4.9			
Max Green Setting (Gmax), s	15.4		10.1	60.1		15.4		35.1	35.1			
Max Q Clear Time (g_c+I1), s	5.0		2.3	23.9		2.1		9.4	23.3			
Green Ext Time (p_c), s	0.6		0.0	5.0		0.0		0.3	3.7			
Intersection Summary												
HCM 6th Ctrl Delay	37.8											
HCM 6th LOS	D											
Notes												
User approved pedestrian interval to be less than phase max green.												
User approved volume balancing among the lanes for turning movement.												






















HCM 6th TWSC
2: Iroquois St/Apple Valley Ln & W Steele Ln

Lance Drive Residential TIA
Existing PM (120 Seconds)

Intersection												
Int Delay, s/veh	3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	24	278	36	35	438	37	38	4	18	22	9	23
Future Vol, veh/h	24	278	36	35	438	37	38	4	18	22	9	23
Conflicting Peds, #/hr	9	0	9	9	0	9	1	0	2	2	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	60	-	-	80	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	25	293	38	37	461	39	40	4	19	23	9	24
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	509	0	0	340	0	0	943	954	323	940	954	491
Stage 1	-	-	-	-	-	-	371	371	-	564	564	-
Stage 2	-	-	-	-	-	-	572	583	-	376	390	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1051	-	-	1214	-	-	242	258	716	243	258	575
Stage 1	-	-	-	-	-	-	647	618	-	509	507	-
Stage 2	-	-	-	-	-	-	503	497	-	643	606	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1042	-	-	1204	-	-	213	240	709	221	240	570
Mov Cap-2 Maneuver	-	-	-	-	-	-	213	240	-	221	240	-
Stage 1	-	-	-	-	-	-	626	598	-	493	487	-
Stage 2	-	-	-	-	-	-	457	477	-	605	586	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.6			0.6			22.2			19.5		
HCM LOS							C			C		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	272	1042	-	-	1204	-	-	304				
HCM Lane V/C Ratio	0.232	0.024	-	-	0.031	-	-	0.187				
HCM Control Delay (s)	22.2	8.5	-	-	8.1	-	-	19.5				
HCM Lane LOS	C	A	-	-	A	-	-	C				
HCM 95th %tile Q(veh)	0.9	0.1	-	-	0.1	-	-	0.7				

HCM 6th Signalized Intersection Summary 3: Range Ave & W Steele Ln

Lance Drive Residential TIA
Existing PM (120 Seconds)












												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	307	60	56	416	44	79	191	40	58	418	48
Future Volume (veh/h)	35	307	60	56	416	44	79	191	40	58	418	48
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.96	1.00		0.92
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	36	320	55	58	433	42	82	199	24	60	435	39
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	599	1073	184	677	1161	113	103	413	49	135	508	45
Arrive On Green	0.70	0.70	0.70	0.70	0.70	0.70	0.06	0.13	0.13	0.08	0.16	0.16
Sat Flow, veh/h	911	1538	264	998	1664	161	1767	3157	375	1767	3247	289
Grp Volume(v), veh/h	36	0	375	58	0	475	82	110	113	60	235	239
Grp Sat Flow(s),veh/h/ln	911	0	1802	998	0	1826	1767	1763	1769	1767	1763	1773
Q Serve(g_s), s	2.0	0.0	9.5	2.8	0.0	12.8	5.5	6.9	7.1	3.9	15.6	15.8
Cycle Q Clear(g_c), s	14.8	0.0	9.5	12.4	0.0	12.8	5.5	6.9	7.1	3.9	15.6	15.8
Prop In Lane	1.00		0.15	1.00		0.09	1.00		0.21	1.00		0.16
Lane Grp Cap(c), veh/h	599	0	1257	677	0	1274	103	230	231	135	276	277
V/C Ratio(X)	0.06	0.00	0.30	0.09	0.00	0.37	0.79	0.48	0.49	0.44	0.85	0.86
Avail Cap(c_a), veh/h	599	0	1257	677	0	1274	236	560	562	162	486	489
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.57	0.57	0.57	1.00	1.00	1.00
Uniform Delay (d), s/veh	10.4	0.0	6.9	9.3	0.0	7.4	55.8	48.4	48.4	53.0	49.3	49.4
Incr Delay (d2), s/veh	0.2	0.0	0.6	0.2	0.0	0.8	2.9	0.3	0.3	0.8	2.9	3.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	3.5	0.6	0.0	4.8	2.5	3.0	3.1	1.7	6.9	7.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.6	0.0	7.5	9.5	0.0	8.3	58.7	48.7	48.8	53.8	52.2	52.5
LnGrp LOS	B	A	A	A	A	A	E	D	D	D	D	D
Approach Vol, veh/h		411			533			305			534	
Approach Delay, s/veh		7.8			8.4			51.4			52.5	
Approach LOS		A			A			D			D	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		87.3	10.0	22.7		87.3	13.1	19.6				
Change Period (Y+Rc), s		3.6	3.0	3.9		3.6	3.9	* 3.9				
Max Green Setting (Gmax), s		60.4	16.0	33.1		60.4	11.0	* 38				
Max Q Clear Time (g_c+I1), s		16.8	7.5	17.8		14.8	5.9	9.1				
Green Ext Time (p_c), s		0.8	0.0	0.8		1.1	0.0	0.4				
Intersection Summary												
HCM 6th Ctrl Delay			28.8									
HCM 6th LOS			C									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

HCM 6th Signalized Intersection Summary

4: Marlow Rd & Guerneville Rd

Lance Drive Residential TIA
Existing PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	166	394	117	254	445	109	130	599	153	64	700	67
Future Volume (veh/h)	166	394	117	254	445	109	130	599	153	64	700	67
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	175	415	66	267	468	95	137	631	81	67	737	65
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	204	564	391	296	627	126	164	766	597	229	832	73
Arrive On Green	0.12	0.16	0.16	0.17	0.22	0.22	0.09	0.22	0.22	0.04	0.08	0.08
Sat Flow, veh/h	1767	3526	1534	1767	2910	586	1767	3526	1537	1767	3271	288
Grp Volume(v), veh/h	175	415	66	267	282	281	137	631	81	67	397	405
Grp Sat Flow(s),veh/h/ln	1767	1763	1534	1767	1763	1734	1767	1763	1537	1767	1763	1797
Q Serve(g_s), s	11.7	13.4	1.6	17.8	17.9	18.2	9.2	20.5	0.0	4.4	26.7	26.8
Cycle Q Clear(g_c), s	11.7	13.4	1.6	17.8	17.9	18.2	9.2	20.5	0.0	4.4	26.7	26.8
Prop In Lane	1.00		1.00	1.00		0.34	1.00		1.00	1.00		0.16
Lane Grp Cap(c), veh/h	204	564	391	296	380	373	164	766	597	229	449	457
V/C Ratio(X)	0.86	0.74	0.17	0.90	0.74	0.75	0.84	0.82	0.14	0.29	0.89	0.89
Avail Cap(c_a), veh/h	284	831	507	349	480	472	202	1064	727	229	480	490
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	0.97	0.97	0.97	0.58	0.58	0.58	0.83	0.83	0.83
Uniform Delay (d), s/veh	52.1	48.0	8.5	49.0	44.0	44.1	53.6	44.8	24.0	52.1	53.2	53.2
Incr Delay (d2), s/veh	16.9	1.9	0.2	22.9	12.1	12.7	13.8	2.2	0.1	0.6	14.6	14.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.0	5.9	1.0	9.6	8.9	9.0	4.6	9.0	1.5	2.0	14.5	14.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	69.0	49.9	8.7	71.9	56.0	56.8	67.3	47.0	24.0	52.7	67.8	67.7
LnGrp LOS	E	D	A	E	E	E	E	D	C	D	E	E
Approach Vol, veh/h	656			830			849			869		
Approach Delay, s/veh	50.8			61.4			48.1			66.6		
Approach LOS	D			E			D			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	25.8	24.9	16.4	35.8	19.1	31.5	20.9	31.4				
Change Period (Y+Rc), s	5.7	* 5.7	5.3	5.3	5.3	5.7	5.3	5.3				
Max Green Setting (Gmax), s	28.3	* 28	13.7	32.7	19.3	32.7	10.2	36.2				
Max Q Clear Time (g_c+11.9), s	15.4	15.4	11.2	28.8	13.7	20.2	6.4	22.5				
Green Ext Time (p_c), s	0.3	2.2	0.1	1.8	0.2	2.6	0.0	3.6				

Intersection Summary

HCM 6th Ctrl Delay 57.1

HCM 6th LOS E

Notes







User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary 5: Ridley Ave & Guerneville Rd

Lance Drive Residential TIA
Existing PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	609	33	62	777	2	14	0	39	3	0	8
Future Volume (veh/h)	5	609	33	62	777	2	14	0	39	3	0	8
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	0.99		0.98	0.99		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	5	655	26	67	835	2	15	0	2	3	0	0
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	636	3149	125	730	3287	8	94	2	5	108	0	0
Arrive On Green	0.91	0.91	0.91	0.91	0.91	0.91	0.03	0.00	0.03	0.03	0.00	0.00
Sat Flow, veh/h	651	3456	137	753	3608	9	1195	66	168	1524	0	0
Grp Volume(v), veh/h	5	334	347	67	408	429	17	0	0	3	0	0
Grp Sat Flow(s),veh/h/ln	651	1763	1831	753	1763	1854	1430	0	0	1524	0	0
Q Serve(g_s), s	0.1	2.5	2.5	1.3	3.2	3.2	1.2	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	3.3	2.5	2.5	3.8	3.2	3.2	1.4	0.0	0.0	0.2	0.0	0.0
Prop In Lane	1.00		0.07	1.00		0.00	0.88		0.12	1.00		0.00
Lane Grp Cap(c), veh/h	636	1606	1668	730	1606	1689	101	0	0	108	0	0
V/C Ratio(X)	0.01	0.21	0.21	0.09	0.25	0.25	0.17	0.00	0.00	0.03	0.00	0.00
Avail Cap(c_a), veh/h	636	1606	1668	730	1606	1689	445	0	0	447	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.93	0.93	0.93	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.8	0.6	0.6	0.8	0.6	0.6	56.9	0.0	0.0	56.4	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.3	0.3	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.1	0.1	0.0	0.0	0.0	0.5	0.0	0.0	0.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.8	0.9	0.8	0.8	0.6	0.6	57.2	0.0	0.0	56.4	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	E	A	A	E	A	A
Approach Vol, veh/h	686					904		17		3		
Approach Delay, s/veh	0.9					0.7		57.2		56.4		
Approach LOS	A					A		E		E		
Timer - Assigned Phs	2		4			6		8				
Phs Duration (G+Y+Rc), s	113.2		6.8			113.2		6.8				
Change Period (Y+Rc), s	3.9		3.0			3.9		3.0				
Max Green Setting (Gmax), s	80.1		33.0			80.1		33.0				
Max Q Clear Time (g_c+I1), s	5.3		2.2			5.8		3.4				
Green Ext Time (p_c), s	1.3		0.0			1.8		0.0				
Intersection Summary												
HCM 6th Ctrl Delay			1.4									
HCM 6th LOS			A									

HCM 6th Signalized Intersection Summary

6: Lance Dr & Guerneville Rd

Lance Drive Residential TIA

Existing PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	562	11	53	842	97	4	25	37	43	32	28
Future Volume (veh/h)	50	562	11	53	842	97	4	25	37	43	32	28
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	0.99		0.99	0.99		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	52	585	10	55	877	83	4	26	4	45	33	17
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	73	654	11	209	922	401	41	141	20	103	64	27
Arrive On Green	0.01	0.06	0.06	0.24	0.52	0.52	0.09	0.09	0.09	0.09	0.09	0.09
Sat Flow, veh/h	1767	3545	61	1767	3526	1534	80	1494	210	618	679	283
Grp Volume(v), veh/h	52	291	304	55	877	83	34	0	0	95	0	0
Grp Sat Flow(s), veh/h/ln	1767	1763	1843	1767	1763	1534	1783	0	0	1581	0	0
Q Serve(g_s), s	3.5	19.7	19.7	3.0	28.3	3.5	0.0	0.0	0.0	4.7	0.0	0.0
Cycle Q Clear(g_c), s	3.5	19.7	19.7	3.0	28.3	3.5	2.1	0.0	0.0	6.8	0.0	0.0
Prop In Lane	1.00		0.03	1.00		1.00	0.12		0.12	0.47		0.18
Lane Grp Cap(c), veh/h	73	325	340	209	922	401	202	0	0	194	0	0
V/C Ratio(X)	0.71	0.89	0.90	0.26	0.95	0.21	0.17	0.00	0.00	0.49	0.00	0.00
Avail Cap(c_a), veh/h	202	848	886	209	1695	738	521	0	0	475	0	0
HCM Platoon Ratio	0.33	0.33	0.33	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.94	0.94	0.94	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	58.5	55.2	55.2	41.6	27.9	22.0	50.1	0.0	0.0	52.2	0.0	0.0
Incr Delay (d2), s/veh	4.8	3.5	3.4	0.2	19.1	1.1	0.1	0.0	0.0	0.7	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	9.6	10.0	1.3	10.5	1.3	1.0	0.0	0.0	2.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	63.3	58.7	58.6	41.8	47.0	23.1	50.3	0.0	0.0	52.9	0.0	0.0
LnGrp LOS	E	E	E	D	D	C	D	A	A	D	A	A
Approach Vol, veh/h	647			1015			34			95		
Approach Delay, s/veh	59.0			44.8			50.3			52.9		
Approach LOS	E			D			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.5	27.4		16.0	10.2	36.7		16.0				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		4.6				
Max Green Setting (Gmax), s	33.4	57.7		33.4	13.7	57.7		33.4				
Max Q Clear Time (g_c+15), s	21.7	21.7		8.8	5.5	30.3		4.1				
Green Ext Time (p_c), s	0.0	0.5		0.1	0.0	1.0		0.0				

Intersection Summary

HCM 6th Ctrl Delay 50.5

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

7: N Dutton Ave/Westberry Dr & Guerneville Rd

Lance Drive Residential TIA
Existing PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	601	94	440	808	17	150	4	429	6	4	4
Future Volume (veh/h)	3	601	94	440	808	17	150	4	429	6	4	4
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	3	646	95	473	869	17	164	0	123	6	4	0
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	8	699	103	1768	2610	51	221	0	908	25	17	0
Arrive On Green	0.00	0.23	0.23	1.00	1.00	1.00	0.06	0.00	0.06	0.02	0.02	0.00
Sat Flow, veh/h	1767	3073	451	3428	3535	69	3534	0	1557	1081	721	0
Grp Volume(v), veh/h	3	370	371	473	433	453	164	0	123	10	0	0
Grp Sat Flow(s), veh/h/ln	1767	1763	1762	1714	1763	1841	1767	0	1557	1801	0	0
Q Serve(g_s), s	0.2	24.6	24.7	0.0	0.0	0.0	5.5	0.0	0.0	0.7	0.0	0.0
Cycle Q Clear(g_c), s	0.2	24.6	24.7	0.0	0.0	0.0	5.5	0.0	0.0	0.7	0.0	0.0
Prop In Lane	1.00		0.26	1.00		0.04	1.00		1.00	0.60		0.00
Lane Grp Cap(c), veh/h	8	401	401	1768	1302	1359	221	0	908	42	0	0
V/C Ratio(X)	0.36	0.92	0.93	0.27	0.33	0.33	0.74	0.00	0.14	0.24	0.00	0.00
Avail Cap(c_a), veh/h	88	535	534	1768	1302	1359	345	0	963	416	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.98	0.98	0.98	0.74	0.74	0.74	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	59.5	45.3	45.4	0.0	0.0	0.0	55.3	0.0	11.6	57.5	0.0	0.0
Incr Delay (d2), s/veh	9.0	28.9	29.3	0.0	0.5	0.5	1.9	0.0	0.0	1.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	13.7	13.8	0.0	0.2	0.2	2.5	0.0	1.4	0.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	68.6	74.2	74.7	0.0	0.5	0.5	57.2	0.0	11.6	58.6	0.0	0.0
LnGrp LOS	E	E	E	A	A	A	E	A	B	E	A	A
Approach Vol, veh/h	744			1359			287			10		
Approach Delay, s/veh	74.4			0.3			37.6			58.6		
Approach LOS	E			A			D			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	67.2	32.6		7.4	5.9	93.9		12.8				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		5.3				
Max Green Setting (Gmax), s	28.3	36.4		27.7	6.0	54.1		11.7				
Max Q Clear Time (g_c+I12), s	26.7			2.7	2.2	2.0		7.5				
Green Ext Time (p_c), s	0.1	0.6		0.0	0.0	0.7		0.0				

Intersection Summary

HCM 6th Ctrl Delay 28.0
HCM 6th LOS C

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 8: Herbert St/Coffey Ln & Guerneville Rd

Lance Drive Residential TIA
Existing PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	162	812	52	48	1036	88	37	20	28	97	23	217
Future Volume (veh/h)	162	812	52	48	1036	88	37	20	28	97	23	217
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.99	1.00		0.93	1.00		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	176	883	54	52	1126	91	40	22	14	105	25	69
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	158	919	56	632	1788	144	79	44	28	165	39	310
Arrive On Green	0.18	0.55	0.55	0.36	0.54	0.54	0.09	0.09	0.09	0.11	0.11	0.11
Sat Flow, veh/h	1767	3365	206	1767	3301	267	908	499	318	1441	343	1483
Grp Volume(v), veh/h	176	463	474	52	601	616	76	0	0	130	0	69
Grp Sat Flow(s), veh/h/ln	1767	1763	1808	1767	1763	1805	1724	0	0	1784	0	1483
Q Serve(g_s), s	10.7	30.1	30.1	2.3	28.4	28.5	5.1	0.0	0.0	8.4	0.0	4.7
Cycle Q Clear(g_c), s	10.7	30.1	30.1	2.3	28.4	28.5	5.1	0.0	0.0	8.4	0.0	4.7
Prop In Lane	1.00		0.11	1.00		0.15	0.53		0.18	0.81		1.00
Lane Grp Cap(c), veh/h	158	482	494	632	955	978	150	0	0	204	0	310
V/C Ratio(X)	1.12	0.96	0.96	0.08	0.63	0.63	0.51	0.00	0.00	0.64	0.00	0.22
Avail Cap(c_a), veh/h	158	623	639	632	955	978	359	0	0	386	0	461
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.88	0.88	0.88	0.83	0.83	0.83	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	49.3	26.6	26.6	25.5	19.1	19.1	52.3	0.0	0.0	50.7	0.0	39.9
Incr Delay (d2), s/veh	102.1	29.8	29.4	0.0	2.6	2.6	1.0	0.0	0.0	1.2	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.6	12.2	12.5	1.0	11.6	11.8	2.2	0.0	0.0	3.8	0.0	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	151.4	56.4	56.0	25.5	21.7	21.7	53.3	0.0	0.0	52.0	0.0	40.0
LnGrp LOS	F	E	E	C	C	C	D	A	A	D	A	D
Approach Vol, veh/h	1113			1269			76			199		
Approach Delay, s/veh	71.3			21.9			53.3			47.8		
Approach LOS	E			C			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	48.2	38.1		18.6	16.0	70.3		15.1				
Change Period (Y+Rc), s	5.3	5.3		4.9	5.3	5.3		4.6				
Max Green Setting (Gmax), s	60.5	42.4		26.0	10.7	38.2		25.0				
Max Q Clear Time (g_c+14), s	14.3	32.1		10.4	12.7	30.5		7.1				
Green Ext Time (p_c), s	0.0	0.7		0.1	0.0	0.9		0.1				
Intersection Summary												
HCM 6th Ctrl Delay	45.4											
HCM 6th LOS	D											

HCM 6th Signalized Intersection Summary 9: Range Ave & Guerneville Rd

Lance Drive Residential TIA
Existing PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	145	572	196	81	696	14	268	151	134	82	217	235
Future Volume (veh/h)	145	572	196	81	696	14	268	151	134	82	217	235
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No		No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	151	596	0	84	725	0	173	306	83	85	226	84
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	588	1768		106	805		277	440	117	196	278	99
Arrive On Green	0.67	1.00	0.00	0.06	0.23	0.00	0.16	0.16	0.16	0.04	0.04	0.04
Sat Flow, veh/h	1767	3618	0	1767	3618	0	1767	2807	746	1767	2504	895
Grp Volume(v), veh/h	151	596	0	84	725	0	173	200	189	85	156	154
Grp Sat Flow(s),veh/h/ln	1767	1763	0	1767	1763	0	1767	1856	1697	1767	1763	1636
Q Serve(g_s), s	4.1	0.0	0.0	5.6	24.0	0.0	11.0	12.2	12.7	5.7	10.6	11.2
Cycle Q Clear(g_c), s	4.1	0.0	0.0	5.6	24.0	0.0	11.0	12.2	12.7	5.7	10.6	11.2
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.44	1.00		0.55
Lane Grp Cap(c), veh/h	588	1768		106	805		277	291	266	196	196	182
V/C Ratio(X)	0.26	0.34		0.80	0.90		0.62	0.69	0.71	0.43	0.80	0.85
Avail Cap(c_a), veh/h	588	1768		143	1002		486	510	467	246	245	228
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	0.82	0.82	0.00	0.95	0.95	0.00	1.00	1.00	1.00	0.58	0.58	0.58
Uniform Delay (d), s/veh	14.1	0.0	0.0	55.7	45.0	0.0	47.3	47.8	48.0	54.1	56.5	56.8
Incr Delay (d2), s/veh	0.1	0.4	0.0	13.3	8.0	0.0	0.9	1.1	1.3	0.3	6.6	10.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.1	0.0	2.9	11.2	0.0	4.9	5.7	5.5	2.6	5.3	5.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.1	0.4	0.0	69.0	53.0	0.0	48.1	48.9	49.3	54.4	63.1	67.7
LnGrp LOS	B	A		E	D		D	D	D	D	E	E
Approach Vol, veh/h	747		A	809		A	562		395			
Approach Delay, s/veh	3.2			54.6			48.8		63.0			
Approach LOS	A			D			D		E			
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	2.5	65.5		18.6	45.3	32.7		23.4				
Change Period (Y+Rc), s	5.3	5.3		5.3	5.3	5.3		4.6				
Max Green Setting (Gmax), s	40.1	40.1		16.7	15.7	34.1		33.0				
Max Q Clear Time (g_c+11), s	2.0	2.0		13.2	6.1	26.0		14.7				
Green Ext Time (p_c), s	0.0	0.7		0.1	0.0	0.8		0.3				

Intersection Summary

HCM 6th Ctrl Delay	39.4
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.












Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

10: Guerneville Rd & Steele Wy

Lance Drive Residential TIA
Existing PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	674	98	128	713	8	61	34	156	311	48	17
Future Volume (veh/h)	16	674	98	128	713	8	61	34	156	311	48	17
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No				No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	16	688	69	131	728	7	48	54	70	352	0	5
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	733	2036	1016	200	792	8	136	143	210	446	0	845
Arrive On Green	0.28	0.39	0.39	0.06	0.22	0.22	0.08	0.08	0.08	0.13	0.00	0.13
Sat Flow, veh/h	1767	3526	1550	3428	3577	34	1767	1856	1530	3534	0	1525
Grp Volume(v), veh/h	16	688	69	131	359	376	48	54	70	352	0	5
Grp Sat Flow(s),veh/h/ln	1767	1763	1550	1714	1763	1849	1767	1856	1530	1767	0	1525
Q Serve(g_s), s	0.8	16.5	2.8	4.5	23.9	23.9	3.1	3.3	5.0	11.6	0.0	0.0
Cycle Q Clear(g_c), s	0.8	16.5	2.8	4.5	23.9	23.9	3.1	3.3	5.0	11.6	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.02	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	733	2036	1016	200	390	409	136	143	210	446	0	845
V/C Ratio(X)	0.02	0.34	0.07	0.66	0.92	0.92	0.35	0.38	0.33	0.79	0.00	0.01
Avail Cap(c_a), veh/h	733	2036	1016	271	580	609	398	417	436	798	0	996
HCM Platoon Ratio	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.88	0.88	0.88	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	25.7	20.6	11.1	55.3	45.7	45.7	52.5	52.6	47.0	50.9	0.0	12.7
Incr Delay (d2), s/veh	0.0	0.4	0.1	1.4	11.8	11.4	0.6	0.6	0.3	1.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	7.4	1.2	2.0	11.6	12.1	1.4	1.6	1.9	5.2	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.7	21.0	11.2	56.7	57.5	57.1	53.1	53.3	47.4	52.1	0.0	12.7
LnGrp LOS	C	C	B	E	E	E	D	D	D	D	A	B
Approach Vol, veh/h	773		866				172		357			
Approach Delay, s/veh	20.2		57.2				50.8		51.5			
Approach LOS	C		E				D		D			
Timer - Assigned Phs	1	2	4		5	6	8					
Phs Duration (G+Y+Rc), s	1.9	74.2	20.1		54.6	31.5	13.8					
Change Period (Y+Rc), s	4.9	4.9	4.9		4.9	4.9	4.6					
Max Green Setting (Gmax), s	1.5	37.1	27.1		7.1	39.5	27.0					
Max Q Clear Time (g_c+16.5), s	1.5	18.5	13.6		2.8	25.9	7.0					
Green Ext Time (p_c), s	0.0	0.9	0.1		0.0	0.6	0.0					

Intersection Summary

HCM 6th Ctrl Delay 42.6

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

11: Cleveland Ave & Guerneville Rd

Lance Drive Residential TIA
Existing PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	RT	LT	RT	RT	LT	RT	RT	LT	RT	RT	LT	RT
Traffic Volume (veh/h)	110	983	74	302	1130	197	85	130	227	405	340	111
Future Volume (veh/h)	110	983	74	302	1130	197	85	130	227	405	340	111
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.98	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	115	1024	68	315	1177	129	89	135	68	292	536	99
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	196	1472	98	369	1251	546	399	520	247	352	604	111
Arrive On Green	0.06	0.30	0.30	0.07	0.24	0.24	0.23	0.23	0.23	0.20	0.20	0.20
Sat Flow, veh/h	3428	4843	321	3428	3526	1538	1767	2305	1096	1767	3032	557
Grp Volume(v), veh/h	115	713	379	315	1177	129	89	101	102	292	327	308
Grp Sat Flow(s), veh/h/ln	1714	1689	1788	1714	1763	1538	1767	1763	1637	1767	1856	1734
Q Serve(g_s), s	3.9	22.4	22.4	10.9	39.3	8.1	4.9	5.7	6.1	19.0	20.6	20.8
Cycle Q Clear(g_c), s	3.9	22.4	22.4	10.9	39.3	8.1	4.9	5.7	6.1	19.0	20.6	20.8
Prop In Lane	1.00		0.18	1.00		1.00	1.00		0.67	1.00		0.32
Lane Grp Cap(c), veh/h	196	1027	543	369	1251	546	399	398	370	352	369	345
V/C Ratio(X)	0.59	0.69	0.70	0.85	0.94	0.24	0.22	0.25	0.27	0.83	0.88	0.89
Avail Cap(c_a), veh/h	203	1027	544	506	1384	604	399	398	370	443	465	435
HCM Platoon Ratio	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.53	0.53	0.53	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	55.2	36.8	36.9	54.7	44.5	32.6	37.9	38.2	38.3	46.1	46.7	46.8
Incr Delay (d2), s/veh	2.6	1.7	3.3	4.3	7.0	0.0	1.3	1.5	1.8	8.4	13.5	15.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	9.3	10.1	5.0	18.9	3.1	2.3	2.6	2.7	9.1	10.7	10.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.8	38.6	40.1	59.0	51.5	32.7	39.2	39.7	40.2	54.5	60.2	62.0
LnGrp LOS	E	D	D	E	D	C	D	D	D	D	E	E
Approach Vol, veh/h	1207			1621			292			927		
Approach Delay, s/veh	40.9			51.5			39.7			59.0		
Approach LOS	D			D			D			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.8	41.4		32.0	11.7	47.5		28.8				
Change Period (Y+Rc), s	4.9	4.9		4.9	4.9	4.9		4.9				
Max Green Setting (Gmax), s	7.8	36.5		16.1	7.1	47.1		30.1				
Max Q Clear Time (g_c+I1), s	11.2	24.4		8.1	5.9	41.3		22.8				
Green Ext Time (p_c), s	0.0	1.3		0.1	0.0	1.2		0.4				

Intersection Summary

HCM 6th Ctrl Delay	49.2
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.
User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 12: US 101 SB Ramps & Guerneville Rd

Lance Drive Residential TIA
Existing PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑					↑	↑	↑
Traffic Volume (veh/h)	0	1103	538	291	1343	0	0	0	0	289	63	300
Future Volume (veh/h)	0	1103	538	291	1343	0	0	0	0	289	63	300
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1856	1856	1856	1856	0				1856	1856	1856
Adj Flow Rate, veh/h	0	1137	230	300	1385	0				344	0	270
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	1368	408	353	1459	0				1792	0	797
Arrive On Green	0.00	0.27	0.27	0.10	0.41	0.00				0.51	0.00	0.51
Sat Flow, veh/h	0	5233	1513	3428	3618	0				3534	0	1572
Grp Volume(v), veh/h	0	1137	230	300	1385	0				344	0	270
Grp Sat Flow(s),veh/h/ln	0	1689	1513	1714	1763	0				1767	0	1572
Q Serve(g_s), s	0.0	25.4	15.7	10.3	45.5	0.0				6.4	0.0	12.3
Cycle Q Clear(g_c), s	0.0	25.4	15.7	10.3	45.5	0.0				6.4	0.0	12.3
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1368	408	353	1459	0				1792	0	797
V/C Ratio(X)	0.00	0.83	0.56	0.85	0.95	0.00				0.19	0.00	0.34
Avail Cap(c_a), veh/h	0	1988	594	546	2089	0				1792	0	797
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.57	0.57	0.77	0.77	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	41.2	37.7	52.9	34.0	0.0				16.2	0.0	17.6
Incr Delay (d2), s/veh	0.0	0.8	0.3	3.6	5.5	0.0				0.2	0.0	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	10.5	5.8	4.6	19.9	0.0				2.5	0.0	4.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	42.0	38.0	56.5	39.4	0.0				16.4	0.0	18.8
LnGrp LOS	A	D	D	E	D	A				B	A	B
Approach Vol, veh/h		1367			1685						614	
Approach Delay, s/veh		41.3			42.5						17.4	
Approach LOS		D			D						B	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	7.3	37.3		65.4		54.6						
Change Period (Y+Rc), s	4.9	4.9		4.6		4.9						
Max Green Setting (Gmax), s	47.1			39.4		71.1						
Max Q Clear Time (g_c+I12, s)	27.4			14.3		47.5						
Green Ext Time (p_c), s	0.0	1.6		0.1		2.1						

Intersection Summary

HCM 6th Ctrl Delay	37.8
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 13: US 101 NB Ramps & Guerneville Rd/Steele Ln

Lance Drive Residential TIA
Existing PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↱↱			↰↱↱		↰	↰↱	↰			
Traffic Volume (veh/h)	376	1016	0	0	983	232	651	1	329	0	0	0
Future Volume (veh/h)	376	1016	0	0	983	232	651	1	329	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1856	1856	0	0	1856	1856	1856	1856	1856			
Adj Flow Rate, veh/h	392	1058	0	0	1024	214	751	0	156			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	3	3	0	0	3	3	3	3	3			
Cap, veh/h	1324	2449	0	0	1118	233	800	0	356			
Arrive On Green	0.77	1.00	0.00	0.00	0.27	0.27	0.23	0.00	0.23			
Sat Flow, veh/h	3428	3618	0	0	4346	872	3534	0	1572			
Grp Volume(v), veh/h	392	1058	0	0	827	411	751	0	156			
Grp Sat Flow(s),veh/h/ln	1714	1763	0	0	1689	1674	1767	0	1572			
Q Serve(g_s), s	4.0	0.0	0.0	0.0	28.5	28.6	25.1	0.0	10.2			
Cycle Q Clear(g_c), s	4.0	0.0	0.0	0.0	28.5	28.6	25.1	0.0	10.2			
Prop In Lane	1.00		0.00	0.00		0.52	1.00		1.00			
Lane Grp Cap(c), veh/h	1324	2449	0	0	903	448	800	0	356			
V/C Ratio(X)	0.30	0.43	0.00	0.00	0.92	0.92	0.94	0.00	0.44			
Avail Cap(c_a), veh/h	1324	2449	0	0	1174	582	1249	0	556			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.69	0.69	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	8.8	0.0	0.0	0.0	42.6	42.7	45.6	0.0	39.9			
Incr Delay (d2), s/veh	0.0	0.4	0.0	0.0	8.1	14.7	7.3	0.0	0.3			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	1.3	0.1	0.0	0.0	12.7	13.4	11.4	0.0	3.9			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	8.9	0.4	0.0	0.0	50.8	57.4	52.9	0.0	40.2			
LnGrp LOS	A	A	A	A	D	E	D	A	D			
Approach Vol, veh/h	1450			1238			907					
Approach Delay, s/veh	2.7			53.0			50.7					
Approach LOS	A			D			D					
Timer - Assigned Phs	2			5			6			8		
Phs Duration (G+Y+Rc), s	88.2			51.2			37.0			31.8		
Change Period (Y+Rc), s	4.9			4.9			4.9			4.6		
Max Green Setting (Gmax), s	68.1			21.5			41.7			42.4		
Max Q Clear Time (g_c+I1), s	2.0			6.0			30.6			27.1		
Green Ext Time (p_c), s	1.5			0.1			1.5			0.1		

Intersection Summary

HCM 6th Ctrl Delay	32.1
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 14: Stony Point Rd/Marlow Rd & W College Ave

Lance Drive Residential TIA
Existing PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	63	236	104	211	331	191	153	738	248	152	803	100
Future Volume (veh/h)	63	236	104	211	331	191	153	738	248	152	803	100
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	66	248	66	222	348	133	161	777	128	160	845	96
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	416	323	84	515	432	162	190	937	868	263	978	111
Arrive On Green	0.24	0.12	0.12	0.29	0.17	0.17	0.11	0.27	0.27	0.15	0.31	0.31
Sat Flow, veh/h	1767	2755	716	1767	2495	936	1767	3526	1544	1767	3184	362
Grp Volume(v), veh/h	66	157	157	222	244	237	161	777	128	160	468	473
Grp Sat Flow(s), veh/h/ln	1767	1763	1709	1767	1763	1668	1767	1763	1544	1767	1763	1783
Q Serve(g_s), s	3.6	10.3	10.8	12.2	15.9	16.4	10.7	24.9	1.8	10.2	30.0	30.0
Cycle Q Clear(g_c), s	3.6	10.3	10.8	12.2	15.9	16.4	10.7	24.9	1.8	10.2	30.0	30.0
Prop In Lane	1.00		0.42	1.00		0.56	1.00		1.00	1.00		0.20
Lane Grp Cap(c), veh/h	416	207	200	515	305	289	190	937	868	263	541	548
V/C Ratio(X)	0.16	0.76	0.79	0.43	0.80	0.82	0.85	0.83	0.15	0.61	0.86	0.86
Avail Cap(c_a), veh/h	416	289	281	515	305	289	305	1254	1008	349	671	679
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.48	0.48	0.48	1.00	1.00	1.00	0.52	0.52	0.52
Uniform Delay (d), s/veh	36.4	51.3	51.5	34.4	47.6	47.8	52.6	41.5	4.1	47.8	39.2	39.2
Incr Delay (d2), s/veh	0.2	7.2	9.4	0.3	7.2	8.9	11.7	3.6	0.1	1.2	5.3	5.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	4.9	5.0	5.2	7.5	7.4	5.3	11.0	0.7	4.5	13.4	13.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.6	58.5	60.9	34.7	54.8	56.7	64.2	45.1	4.2	49.0	44.5	44.5
LnGrp LOS	D	E	E	C	D	E	E	D	A	D	D	D
Approach Vol, veh/h	380				703				1066			
Approach Delay, s/veh	55.7				49.1				43.1			
Approach LOS	E				D				D			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	40.3	19.4	18.2	42.2	33.6	26.1	23.2	37.2				
Change Period (Y+Rc), s	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3				
Max Green Setting (Gmax), s	42.8	19.7	20.7	45.7	12.7	19.7	23.7	42.7				
Max Q Clear Time (g_c+14.2), s	14.2	12.8	12.7	32.0	5.6	18.4	12.2	26.9				
Green Ext Time (p_c), s	0.0	0.9	0.2	4.8	0.1	0.4	0.3	5.0				

Intersection Summary

HCM 6th Ctrl Delay 46.6

HCM 6th LOS D

Notes









User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

15: N Dutton Ave & W College Ave

Lance Drive Residential TIA
Existing PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	76	558	96	180	747	156	134	314	124	288	483	132
Future Volume (veh/h)	76	558	96	180	747	156	134	314	124	288	483	132
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	79	581	88	188	778	144	140	327	95	300	503	118
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	100	644	97	217	841	156	586	395	113	703	601	140
Arrive On Green	0.06	0.21	0.21	0.12	0.28	0.28	0.33	0.15	0.15	0.40	0.21	0.21
Sat Flow, veh/h	1767	3063	463	1767	2961	548	1767	2692	768	1767	2825	659
Grp Volume(v), veh/h	79	334	335	188	463	459	140	212	210	300	313	308
Grp Sat Flow(s),veh/h/ln	1767	1763	1763	1767	1763	1746	1767	1763	1697	1767	1763	1721
Q Serve(g_s), s	5.3	22.1	22.3	12.5	30.6	30.6	6.9	14.0	14.5	14.8	20.4	20.6
Cycle Q Clear(g_c), s	5.3	22.1	22.3	12.5	30.6	30.6	6.9	14.0	14.5	14.8	20.4	20.6
Prop In Lane	1.00		0.26	1.00		0.31	1.00		0.45	1.00		0.38
Lane Grp Cap(c), veh/h	100	370	370	217	501	496	586	258	249	703	375	366
V/C Ratio(X)	0.79	0.90	0.91	0.87	0.92	0.92	0.24	0.82	0.84	0.43	0.83	0.84
Avail Cap(c_a), veh/h	147	457	457	280	589	584	586	325	313	703	516	503
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.83	0.83	0.83	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	55.9	46.2	46.2	51.6	41.7	41.7	29.1	49.7	49.9	26.2	45.2	45.3
Incr Delay (d2), s/veh	7.7	14.0	14.6	16.6	17.6	17.8	0.1	10.2	13.1	0.2	6.2	6.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	11.0	11.1	6.5	15.5	15.4	2.9	6.8	7.0	6.1	9.3	9.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	63.6	60.2	60.9	68.2	59.3	59.5	29.2	59.9	62.9	26.4	51.4	52.2
LnGrp LOS	E	E	E	E	E	E	C	E	E	C	D	D
Approach Vol, veh/h	748			1110			562			921		
Approach Delay, s/veh	60.9			60.9			53.4			43.5		
Approach LOS	E			E			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	29.1	42.8	29.4	9.8	38.0	50.7	21.5					
Change Period (Y+Rc), s	3.9	3.9	3.0	3.9	3.0	3.9	3.0	3.9				
Max Green Setting (Gmax), s	31	31	21.0	35.1	10.0	40.1	34.0	22.1				
Max Q Clear Time (g_c+14.5), s	24.3	24.3	8.9	22.6	7.3	32.6	16.8	16.5				
Green Ext Time (p_c), s	0.0	0.9	0.0	1.0	0.0	1.5	0.1	0.5				

Intersection Summary

HCM 6th Ctrl Delay 54.8

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection

Intersection Delay, s/veh 7.2

Intersection LOS A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	0	0	0	73	0	0	0	61	0	0
Future Vol, veh/h	0	0	0	0	0	73	0	0	0	61	0	0
Peak Hour Factor	0.86	0.86	0.92	0.92	0.86	0.86	0.92	0.92	0.92	0.86	0.92	0.86
Heavy Vehicles, %	3	3	2	2	3	3	2	2	2	3	2	3
Mvmt Flow	0	0	0	0	0	85	0	0	0	71	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0























Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	0	6.8	0	7.7
HCM LOS	-	A	-	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	0%	0%	100%
Vol Thru, %	100%	100%	0%	0%
Vol Right, %	0%	0%	100%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	0	0	73	61
LT Vol	0	0	0	61
Through Vol	0	0	0	0
RT Vol	0	0	73	0
Lane Flow Rate	0	0	85	71
Geometry Grp	1	1	1	1
Degree of Util (X)	0	0	0.082	0.085
Departure Headway (Hd)	4.136	4.14	3.474	4.299
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	0	0	1025	836
Service Time	2.17	2.19	1.517	2.313
HCM Lane V/C Ratio	0	0	0.083	0.085
HCM Control Delay	7.2	7.2	6.8	7.7
HCM Lane LOS	N	N	A	A
HCM 95th-tile Q	0	0	0.3	0.3

HCM 6th Signalized Intersection Summary







1: Marlow Rd & Marlow Ct/W Steele Ln

Lance Drive Residential TIA
Existing PM (120-140 Seconds)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	0	2	163	4	134	5	623	161	105	707	2
Future Volume (veh/h)	2	0	2	163	4	134	5	623	161	105	707	2
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.96	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	2	0	0	175	0	83	5	656	116	111	744	2
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	42	0	0	1923	0	973	11	778	1190	135	1047	3
Arrive On Green	0.02	0.00	0.00	0.54	0.00	0.54	0.01	0.22	0.22	0.08	0.29	0.29
Sat Flow, veh/h	1767	0	0	3534	0	1568	1767	3526	1516	1767	3607	10
Grp Volume(v), veh/h	2	0	0	175	0	83	5	656	116	111	364	382
Grp Sat Flow(s),veh/h/ln	1767	0	0	1767	0	1568	1767	1763	1516	1767	1763	1854
Q Serve(g_s), s	0.2	0.0	0.0	3.3	0.0	0.0	0.4	24.9	2.7	8.7	25.8	25.8
Cycle Q Clear(g_c), s	0.2	0.0	0.0	3.3	0.0	0.0	0.4	24.9	2.7	8.7	25.8	25.8
Prop In Lane	1.00		0.00	1.00		1.00	1.00		1.00	1.00		0.01
Lane Grp Cap(c), veh/h	42	0	0	1923	0	973	11	778	1190	135	512	538
V/C Ratio(X)	0.05	0.00	0.00	0.09	0.00	0.09	0.45	0.84	0.10	0.83	0.71	0.71
Avail Cap(c_a), veh/h	379	0	0	1923	0	973	64	1010	1290	228	669	703
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.66	0.66	0.66	1.00	1.00	1.00
Uniform Delay (d), s/veh	66.8	0.0	0.0	15.3	0.0	10.7	69.3	52.2	4.2	63.8	44.4	44.4
Incr Delay (d2), s/veh	0.5	0.0	0.0	0.1	0.0	0.2	17.5	3.5	0.0	11.9	2.4	2.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.0	1.4	0.0	1.1	0.2	11.4	3.4	4.3	11.6	12.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	67.3	0.0	0.0	15.4	0.0	10.8	86.8	55.8	4.2	75.6	46.8	46.7
LnGrp LOS	E	A	A	B	A	B	F	E	A	E	D	D
Approach Vol, veh/h		2			258			777			857	
Approach Delay, s/veh		67.3			13.9			48.3			50.5	
Approach LOS		E			B			D			D	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		80.8	5.8	45.6		7.9	15.6	35.8				
Change Period (Y+Rc), s		4.6	4.9	4.9		4.6	4.9	4.9				
Max Green Setting (Gmax), s		32.8	5.1	53.1		30.0	18.1	40.1				
Max Q Clear Time (g_c+I1), s		5.3	2.4	27.8		2.2	10.7	26.9				
Green Ext Time (p_c), s		0.9	0.0	4.7		0.0	0.1	3.9				
Intersection Summary												
HCM 6th Ctrl Delay				44.6								
HCM 6th LOS				D								
Notes												
User approved pedestrian interval to be less than phase max green.												
User approved volume balancing among the lanes for turning movement.												






















HCM 6th TWSC
2: Iroquois St/Apple Valley Ln & W Steele Ln

Lance Drive Residential TIA
Existing PM (120-140 Seconds)

Intersection												
Int Delay, s/veh	3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	24	278	36	35	438	37	38	4	18	22	9	23
Future Vol, veh/h	24	278	36	35	438	37	38	4	18	22	9	23
Conflicting Peds, #/hr	9	0	9	9	0	9	1	0	2	2	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	60	-	-	80	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	25	293	38	37	461	39	40	4	19	23	9	24
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	509	0	0	340	0	0	943	954	323	940	954	491
Stage 1	-	-	-	-	-	-	371	371	-	564	564	-
Stage 2	-	-	-	-	-	-	572	583	-	376	390	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1051	-	-	1214	-	-	242	258	716	243	258	575
Stage 1	-	-	-	-	-	-	647	618	-	509	507	-
Stage 2	-	-	-	-	-	-	503	497	-	643	606	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1042	-	-	1204	-	-	213	240	709	221	240	570
Mov Cap-2 Maneuver	-	-	-	-	-	-	213	240	-	221	240	-
Stage 1	-	-	-	-	-	-	626	598	-	493	487	-
Stage 2	-	-	-	-	-	-	457	477	-	605	586	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.6			0.6			22.2			19.5		
HCM LOS							C			C		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	272	1042	-	-	1204	-	-	304				
HCM Lane V/C Ratio	0.232	0.024	-	-	0.031	-	-	0.187				
HCM Control Delay (s)	22.2	8.5	-	-	8.1	-	-	19.5				
HCM Lane LOS	C	A	-	-	A	-	-	C				
HCM 95th %tile Q(veh)	0.9	0.1	-	-	0.1	-	-	0.7				

HCM 6th Signalized Intersection Summary 3: Range Ave & W Steele Ln

Lance Drive Residential TIA
Existing PM (120-140 Seconds)











												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	307	60	56	416	44	79	191	40	58	418	48
Future Volume (veh/h)	35	307	60	56	416	44	79	191	40	58	418	48
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.96	1.00		0.92
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	36	320	55	58	433	42	82	199	24	60	435	39
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	612	1100	189	691	1190	115	102	384	46	145	494	44
Arrive On Green	0.72	0.72	0.72	0.72	0.72	0.72	0.06	0.12	0.12	0.08	0.15	0.15
Sat Flow, veh/h	911	1538	264	998	1664	161	1767	3156	375	1767	3246	289
Grp Volume(v), veh/h	36	0	375	58	0	475	82	110	113	60	235	239
Grp Sat Flow(s),veh/h/ln	911	0	1802	998	0	1826	1767	1763	1768	1767	1763	1773
Q Serve(g_s), s	2.2	0.0	10.5	3.1	0.0	14.0	6.4	8.2	8.4	4.5	18.3	18.5
Cycle Q Clear(g_c), s	16.2	0.0	10.5	13.6	0.0	14.0	6.4	8.2	8.4	4.5	18.3	18.5
Prop In Lane	1.00		0.15	1.00		0.09	1.00		0.21	1.00		0.16
Lane Grp Cap(c), veh/h	612	0	1289	691	0	1305	102	214	215	145	268	270
V/C Ratio(X)	0.06	0.00	0.29	0.08	0.00	0.36	0.80	0.51	0.53	0.41	0.88	0.89
Avail Cap(c_a), veh/h	612	0	1289	691	0	1305	215	517	519	177	480	482
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.56	0.56	0.56	1.00	1.00	1.00
Uniform Delay (d), s/veh	10.8	0.0	7.2	9.6	0.0	7.7	65.2	57.6	57.7	61.1	58.1	58.2
Incr Delay (d2), s/veh	0.2	0.0	0.6	0.2	0.0	0.8	3.1	0.4	0.4	0.7	3.6	3.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	4.0	0.7	0.0	5.4	3.0	3.6	3.8	2.0	8.3	8.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.0	0.0	7.7	9.9	0.0	8.5	68.3	58.0	58.1	61.8	61.6	62.0
LnGrp LOS	B	A	A	A	A	A	E	E	E	E	E	E
Approach Vol, veh/h		411			533			305			534	
Approach Delay, s/veh		8.0			8.6			60.8			61.8	
Approach LOS		A			A			E			E	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		103.7	11.1	25.2		103.7	15.4	20.9				
Change Period (Y+Rc), s		3.6	3.0	3.9		3.6	3.9	*3.9				
Max Green Setting (Gmax), s		74.4	17.0	38.1		74.4	14.0	*41				
Max Q Clear Time (g_c+I1), s		18.2	8.4	20.5		16.0	6.5	10.4				
Green Ext Time (p_c), s		0.8	0.0	0.8		1.1	0.0	0.4				
Intersection Summary												
HCM 6th Ctrl Delay			33.3									
HCM 6th LOS			C									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

HCM 6th Signalized Intersection Summary

4: Marlow Rd & Guerneville Rd

Lance Drive Residential TIA
Existing PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	166	394	117	254	445	109	130	599	153	64	700	67
Future Volume (veh/h)	166	394	117	254	445	109	130	599	153	64	700	67
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No				No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	175	415	66	267	468	95	137	631	81	67	737	65
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	204	564	391	296	627	126	164	766	597	223	822	72
Arrive On Green	0.12	0.16	0.16	0.17	0.22	0.22	0.09	0.22	0.22	0.13	0.25	0.25
Sat Flow, veh/h	1767	3526	1534	1767	2910	586	1767	3526	1537	1767	3271	288
Grp Volume(v), veh/h	175	415	66	267	282	281	137	631	81	67	397	405
Grp Sat Flow(s),veh/h/ln	1767	1763	1534	1767	1763	1734	1767	1763	1537	1767	1763	1797
Q Serve(g_s), s	11.7	13.4	1.6	17.8	17.9	18.2	9.2	20.5	0.0	4.1	26.1	26.2
Cycle Q Clear(g_c), s	11.7	13.4	1.6	17.8	17.9	18.2	9.2	20.5	0.0	4.1	26.1	26.2
Prop In Lane	1.00		1.00	1.00		0.34	1.00		1.00	1.00		0.16
Lane Grp Cap(c), veh/h	204	564	391	296	380	373	164	766	597	223	443	451
V/C Ratio(X)	0.86	0.74	0.17	0.90	0.74	0.75	0.84	0.82	0.14	0.30	0.90	0.90
Avail Cap(c_a), veh/h	284	831	507	349	480	472	202	1064	727	223	480	490
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.98	0.98	0.98	0.53	0.53	0.53	0.81	0.81	0.81
Uniform Delay (d), s/veh	52.1	48.0	8.4	49.0	44.0	44.1	53.6	44.8	24.0	47.6	43.4	43.4
Incr Delay (d2), s/veh	16.9	1.9	0.2	23.1	12.2	12.9	12.7	2.0	0.1	0.6	15.6	15.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.0	5.9	1.0	9.6	9.0	9.0	4.6	9.0	1.5	1.8	13.1	13.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	69.0	49.9	8.6	72.1	56.2	56.9	66.3	46.8	24.0	48.2	59.0	58.9
LnGrp LOS	E	D	A	E	E	E	E	D	C	D	E	E
Approach Vol, veh/h	656		830			849			869			
Approach Delay, s/veh	50.8		61.5			47.8			58.1			
Approach LOS	D		E			D			E			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	25.8	24.9	16.4	35.4	19.1	31.5	20.5	31.4				
Change Period (Y+Rc), s	5.7	* 5.7	5.3	5.3	5.3	5.7	5.3	5.3				
Max Green Setting (Gmax), s	28.3	* 28	13.7	32.7	19.3	32.7	10.2	36.2				
Max Q Clear Time (g_c+I1), s	19.8	15.4	11.2	28.2	13.7	20.2	6.1	22.5				
Green Ext Time (p_c), s	0.3	2.2	0.1	2.0	0.2	2.6	0.0	3.6				

Intersection Summary

HCM 6th Ctrl Delay 54.8

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary 5: Ridley Ave & Guerneville Rd

Lance Drive Residential TIA
Existing PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	609	33	62	777	2	14	0	39	3	0	8
Future Volume (veh/h)	5	609	33	62	777	2	14	0	39	3	0	8
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	0.99		0.98	0.99		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No		No				No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	5	655	26	67	835	2	15	0	2	3	0	0
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	651	3182	126	731	3322	8	83	3	5	97	0	0
Arrive On Green	0.92	0.92	0.92	1.00	1.00	1.00	0.03	0.00	0.03	0.03	0.00	0.00
Sat Flow, veh/h	651	3456	137	753	3608	9	1164	100	169	1528	0	0
Grp Volume(v), veh/h	5	334	347	67	408	429	17	0	0	3	0	0
Grp Sat Flow(s),veh/h/ln	651	1763	1831	753	1763	1854	1433	0	0	1528	0	0
Q Serve(g_s), s	0.1	2.6	2.6	0.3	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.1	2.6	2.6	2.9	0.0	0.0	1.6	0.0	0.0	0.2	0.0	0.0
Prop In Lane	1.00		0.07	1.00		0.00	0.88		0.12	1.00		0.00
Lane Grp Cap(c), veh/h	651	1623	1685	731	1623	1707	91	0	0	97	0	0
V/C Ratio(X)	0.01	0.21	0.21	0.09	0.25	0.25	0.19	0.00	0.00	0.03	0.00	0.00
Avail Cap(c_a), veh/h	651	1623	1685	731	1623	1707	401	0	0	404	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.93	0.93	0.93	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.4	0.5	0.5	0.0	0.0	0.0	66.6	0.0	0.0	66.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.3	0.3	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.1	0.1	0.0	0.0	0.0	0.6	0.0	0.0	0.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.5	0.8	0.8	0.0	0.0	0.0	67.0	0.0	0.0	66.0	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	E	A	A	E	A	A
Approach Vol, veh/h	686				904		17		3			
Approach Delay, s/veh	0.8				0.0		67.0		66.0			
Approach LOS	A				A		E		E			
Timer - Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	132.8		7.2		132.8		7.2					
Change Period (Y+Rc), s	3.9		3.0		3.9		3.0					
Max Green Setting (Gmax), s	98.1		35.0		98.1		35.0					
Max Q Clear Time (g_c+I1), s	4.6		2.2		4.9		3.6					
Green Ext Time (p_c), s	1.3		0.0		1.8		0.0					

Intersection Summary

HCM 6th Ctrl Delay	1.2
HCM 6th LOS	A

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

6: Lance Dr & Guerneville Rd

Lance Drive Residential TIA

Existing PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	562	11	53	842	97	4	25	37	43	32	28
Future Volume (veh/h)	50	562	11	53	842	97	4	25	37	43	32	28
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	0.99		0.99	0.99		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	52	585	10	55	877	83	4	26	4	45	33	17
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	66	627	11	213	915	398	36	137	19	96	61	26
Arrive On Green	0.08	0.35	0.35	0.24	0.52	0.52	0.09	0.09	0.09	0.09	0.09	0.09
Sat Flow, veh/h	1767	3545	61	1767	3526	1534	80	1495	210	632	667	283
Grp Volume(v), veh/h	52	291	304	55	877	83	34	0	0	95	0	0
Grp Sat Flow(s), veh/h/ln	1767	1763	1843	1767	1763	1534	1785	0	0	1582	0	0
Q Serve(g_s), s	4.0	22.3	22.3	3.5	33.3	4.1	0.0	0.0	0.0	5.5	0.0	0.0
Cycle Q Clear(g_c), s	4.0	22.3	22.3	3.5	33.3	4.1	2.4	0.0	0.0	8.0	0.0	0.0
Prop In Lane	1.00		0.03	1.00		1.00	0.12		0.12	0.47		0.18
Lane Grp Cap(c), veh/h	66	312	326	213	915	398	192	0	0	182	0	0
V/C Ratio(X)	0.78	0.93	0.93	0.26	0.96	0.21	0.18	0.00	0.00	0.52	0.00	0.00
Avail Cap(c_a), veh/h	211	903	944	213	1806	786	484	0	0	441	0	0
HCM Platoon Ratio	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.94	0.94	0.94	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	64.2	44.4	44.4	48.1	32.9	25.9	58.9	0.0	0.0	61.3	0.0	0.0
Incr Delay (d2), s/veh	7.3	5.4	5.3	0.2	20.3	1.1	0.2	0.0	0.0	0.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	8.5	8.8	1.5	13.1	1.5	1.1	0.0	0.0	3.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	71.5	49.9	49.7	48.3	53.2	27.0	59.1	0.0	0.0	62.1	0.0	0.0
LnGrp LOS	E	D	D	D	D	C	E	A	A	E	A	A
Approach Vol, veh/h	647			1015			34			95		
Approach Delay, s/veh	51.5			50.8			59.1			62.1		
Approach LOS	D			D			E			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	22.1	30.1		17.4	10.6	41.7		17.4				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		4.6				
Max Green Setting (Gmax), s	66.3	71.7		36.4	16.7	71.7		36.4				
Max Q Clear Time (g_c+1.5), s	24.3	24.3		10.0	6.0	35.3		4.4				
Green Ext Time (p_c), s	0.0	0.5		0.1	0.0	1.0		0.0				

Intersection Summary

HCM 6th Ctrl Delay 51.8

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

7: N Dutton Ave/Westberry Dr & Guerneville Rd

Lance Drive Residential TIA
Existing PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	601	94	440	808	17	150	4	429	6	4	4
Future Volume (veh/h)	3	601	94	440	808	17	150	4	429	6	4	4
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	3	646	95	473	869	17	164	0	123	6	4	0
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	8	692	102	1869	2706	53	213	0	951	25	17	0
Arrive On Green	0.00	0.23	0.23	1.00	1.00	1.00	0.06	0.00	0.06	0.02	0.02	0.00
Sat Flow, veh/h	1767	3073	451	3428	3535	69	3534	0	1557	1081	721	0
Grp Volume(v), veh/h	3	370	371	473	433	453	164	0	123	10	0	0
Grp Sat Flow(s), veh/h/ln	1767	1763	1762	1714	1763	1841	1767	0	1557	1801	0	0
Q Serve(g_s), s	0.2	28.8	28.9	0.0	0.0	0.0	6.4	0.0	0.0	0.8	0.0	0.0
Cycle Q Clear(g_c), s	0.2	28.8	28.9	0.0	0.0	0.0	6.4	0.0	0.0	0.8	0.0	0.0
Prop In Lane	1.00		0.26	1.00		0.04	1.00		1.00	0.60		0.00
Lane Grp Cap(c), veh/h	8	397	397	1869	1350	1410	213	0	951	41	0	0
V/C Ratio(X)	0.36	0.93	0.94	0.25	0.32	0.32	0.77	0.00	0.13	0.24	0.00	0.00
Avail Cap(c_a), veh/h	77	559	559	1869	1350	1410	371	0	1021	356	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.98	0.98	0.98	0.77	0.77	0.77	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	69.5	53.2	53.2	0.0	0.0	0.0	64.8	0.0	11.8	67.2	0.0	0.0
Incr Delay (d2), s/veh	9.2	30.6	31.1	0.0	0.5	0.5	2.2	0.0	0.0	1.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	15.9	16.0	0.0	0.2	0.2	2.9	0.0	1.6	0.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	78.7	83.8	84.3	0.0	0.5	0.5	67.1	0.0	11.8	68.3	0.0	0.0
LnGrp LOS	E	F	F	A	A	A	E	A	B	E	A	A
Approach Vol, veh/h	744			1359			287			10		
Approach Delay, s/veh	84.0			0.3			43.4			68.3		
Approach LOS	F			A			D			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.6	36.8		7.8	6.0	112.5		13.7				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		5.3				
Max Green Setting (Gmax), s	32.3	44.4		27.7	6.1	71.0		14.7				
Max Q Clear Time (g_c+I12), s	12.6	30.9		2.8	2.2	2.0		8.4				
Green Ext Time (p_c), s	0.1	0.6		0.0	0.0	0.7		0.0				

Intersection Summary

HCM 6th Ctrl Delay	31.7
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 8: Herbert St/Coffey Ln & Guerneville Rd

Lance Drive Residential TIA
Existing PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	162	812	52	48	1036	88	37	20	28	97	23	217
Future Volume (veh/h)	162	812	52	48	1036	88	37	20	28	97	23	217
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.99	1.00		0.93	1.00		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	176	883	54	52	1126	91	40	22	14	105	25	69
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	196	915	56	691	1822	147	76	42	27	158	38	336
Arrive On Green	0.22	0.54	0.54	0.39	0.55	0.55	0.08	0.08	0.08	0.11	0.11	0.11
Sat Flow, veh/h	1767	3365	206	1767	3301	267	907	499	317	1441	343	1480
Grp Volume(v), veh/h	176	463	474	52	601	616	76	0	0	130	0	69
Grp Sat Flow(s), veh/h/ln	1767	1763	1808	1767	1763	1805	1724	0	0	1784	0	1480
Q Serve(g_s), s	13.5	35.3	35.3	2.6	32.4	32.5	5.9	0.0	0.0	9.8	0.0	5.3
Cycle Q Clear(g_c), s	13.5	35.3	35.3	2.6	32.4	32.5	5.9	0.0	0.0	9.8	0.0	5.3
Prop In Lane	1.00		0.11	1.00		0.15	0.53		0.18	0.81		1.00
Lane Grp Cap(c), veh/h	196	479	491	691	973	996	145	0	0	195	0	336
V/C Ratio(X)	0.90	0.97	0.97	0.08	0.62	0.62	0.52	0.00	0.00	0.67	0.00	0.21
Avail Cap(c_a), veh/h	211	742	760	691	973	996	308	0	0	332	0	450
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.88	0.88	0.88	0.83	0.83	0.83	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	53.7	31.3	31.3	26.8	21.3	21.3	61.4	0.0	0.0	59.9	0.0	44.6
Incr Delay (d2), s/veh	29.9	30.9	30.4	0.0	2.4	2.4	1.1	0.0	0.0	1.5	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.9	14.9	15.2	1.1	13.5	13.8	2.7	0.0	0.0	4.5	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	83.6	62.2	61.8	26.8	23.8	23.7	62.5	0.0	0.0	61.3	0.0	44.7
LnGrp LOS	F	E	E	C	C	C	E	A	A	E	A	D
Approach Vol, veh/h	1113			1269			76			199		
Approach Delay, s/veh	65.4			23.9			62.5			55.6		
Approach LOS	E			C			E			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	60.0	43.4		20.2	20.8	82.6		16.4				
Change Period (Y+Rc), s	5.3	5.3		4.9	5.3	5.3		4.6				
Max Green Setting (Gmax), s	58.9	58.9		26.1	16.7	52.1		25.0				
Max Q Clear Time (g_c+14.6), s	37.3	37.3		11.8	15.5	34.5		7.9				
Green Ext Time (p_c), s	0.0	0.8		0.1	0.0	1.0		0.1				
Intersection Summary												
HCM 6th Ctrl Delay				44.8								
HCM 6th LOS				D								

HCM 6th Signalized Intersection Summary 9: Range Ave & Guerneville Rd

Lance Drive Residential TIA
Existing PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	145	572	196	81	696	14	268	151	134	82	217	235
Future Volume (veh/h)	145	572	196	81	696	14	268	151	134	82	217	235
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	151	596	0	84	725	0	173	306	83	85	226	84
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	658	1886		104	782		266	422	112	193	273	98
Arrive On Green	0.74	1.00	0.00	0.06	0.22	0.00	0.15	0.15	0.15	0.04	0.04	0.04
Sat Flow, veh/h	1767	3618	0	1767	3618	0	1767	2806	746	1767	2503	894
Grp Volume(v), veh/h	151	596	0	84	725	0	173	200	189	85	156	154
Grp Sat Flow(s),veh/h/ln	1767	1763	0	1767	1763	0	1767	1856	1696	1767	1763	1635
Q Serve(g_s), s	3.7	0.0	0.0	6.6	28.2	0.0	12.9	14.4	14.9	6.6	12.3	13.1
Cycle Q Clear(g_c), s	3.7	0.0	0.0	6.6	28.2	0.0	12.9	14.4	14.9	6.6	12.3	13.1
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.44	1.00		0.55
Lane Grp Cap(c), veh/h	658	1886		104	782		266	279	255	193	192	178
V/C Ratio(X)	0.23	0.32		0.81	0.93		0.65	0.72	0.74	0.44	0.81	0.86
Avail Cap(c_a), veh/h	658	1886		170	1030		422	443	405	302	301	279
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	0.86	0.86	0.00	0.95	0.95	0.00	1.00	1.00	1.00	0.56	0.56	0.56
Uniform Delay (d), s/veh	11.7	0.0	0.0	65.1	53.4	0.0	56.0	56.6	56.9	63.3	66.1	66.4
Incr Delay (d2), s/veh	0.1	0.4	0.0	5.2	9.7	0.0	1.0	1.3	1.6	0.3	2.6	5.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.1	0.0	3.1	13.5	0.0	5.9	6.9	6.5	3.1	6.0	6.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.8	0.4	0.0	70.2	63.1	0.0	57.0	57.9	58.4	63.6	68.6	72.0
LnGrp LOS	B	A		E	E		E	E	E	E	E	E
Approach Vol, veh/h	747		A	809		A	562		395			
Approach Delay, s/veh	2.7			63.8			57.8		68.9			
Approach LOS	A			E			E		E			
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	3.6	80.2		20.6	57.4	36.4		25.7				
Change Period (Y+Rc), s	5.3	5.3		5.3	5.3	5.3		4.6				
Max Green Setting (Gmax), s	3.5	48.7		23.9	21.3	40.9		33.4				
Max Q Clear Time (g_c+1.0), s	1.6	2.0		15.1	5.7	30.2		16.9				
Green Ext Time (p_c), s	0.0	0.7		0.2	0.0	0.9		0.3				

Intersection Summary

HCM 6th Ctrl Delay 45.1

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

10: Guerneville Rd & Steele Wy

Lance Drive Residential TIA
Existing PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	674	98	128	713	8	61	34	156	311	48	17
Future Volume (veh/h)	16	674	98	128	713	8	61	34	156	311	48	17
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	16	688	69	131	728	7	48	54	70	352	0	5
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	790	2163	1068	178	782	8	131	138	195	432	0	889
Arrive On Green	0.15	0.20	0.20	0.05	0.22	0.22	0.07	0.07	0.07	0.12	0.00	0.12
Sat Flow, veh/h	1767	3526	1550	3428	3577	34	1767	1856	1528	3534	0	1524
Grp Volume(v), veh/h	16	688	69	131	359	376	48	54	70	352	0	5
Grp Sat Flow(s), veh/h/ln	1767	1763	1550	1714	1763	1849	1767	1856	1528	1767	0	1524
Q Serve(g_s), s	1.1	23.3	4.1	5.3	27.9	28.0	3.6	3.9	5.9	13.6	0.0	0.0
Cycle Q Clear(g_c), s	1.1	23.3	4.1	5.3	27.9	28.0	3.6	3.9	5.9	13.6	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.02	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	790	2163	1068	178	385	404	131	138	195	432	0	889
V/C Ratio(X)	0.02	0.32	0.06	0.73	0.93	0.93	0.37	0.39	0.36	0.81	0.00	0.01
Avail Cap(c_a), veh/h	790	2163	1068	321	656	688	358	376	392	810	0	1053
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.89	0.89	0.89	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	33.5	30.9	15.4	65.4	53.7	53.7	61.7	61.8	56.0	59.9	0.0	13.0
Incr Delay (d2), s/veh	0.0	0.3	0.1	2.2	8.2	7.9	0.6	0.7	0.4	1.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	11.1	1.9	2.4	13.2	13.8	1.7	1.9	2.3	6.2	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.5	31.2	15.5	67.6	61.9	61.6	62.3	62.5	56.4	61.3	0.0	13.0
LnGrp LOS	C	C	B	E	E	E	E	E	E	E	A	B
Approach Vol, veh/h	773			866			172			357		
Approach Delay, s/veh	29.8			62.6			60.0			60.7		
Approach LOS	C			E			E			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	2.2	90.8		22.0	67.5	35.5		15.0				
Change Period (Y+Rc), s	4.9	4.9		4.9	4.9	4.9		4.6				
Max Green Setting (Gmax), s	47.1			32.1	8.1	52.1		28.4				
Max Q Clear Time (g_c+17), s	25.3			15.6	3.1	30.0		7.9				
Green Ext Time (p_c), s	0.0	0.9		0.1	0.0	0.7		0.0				

Intersection Summary

HCM 6th Ctrl Delay 50.4

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

11: Cleveland Ave & Guerneville Rd

Lance Drive Residential TIA
Existing PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰ ↱	↑ ↑		↰ ↱	↑ ↑	↱	↰	↑ ↑		↰ ↱	↑ ↑	
Traffic Volume (veh/h)	110	983	74	302	1130	197	85	130	227	405	340	111
Future Volume (veh/h)	110	983	74	302	1130	197	85	130	227	405	340	111
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.98	1.00		0.99	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	115	1024	68	315	1177	129	89	135	68	292	536	99
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	169	1428	95	360	1235	539	473	618	294	340	583	107
Arrive On Green	0.05	0.29	0.29	0.11	0.35	0.35	0.27	0.27	0.27	0.19	0.19	0.19
Sat Flow, veh/h	3428	4843	321	3428	3526	1538	1767	2306	1097	1767	3032	557
Grp Volume(v), veh/h	115	713	379	315	1177	129	89	101	102	292	327	308
Grp Sat Flow(s), veh/h/ln	1714	1689	1787	1714	1763	1538	1767	1763	1640	1767	1856	1734
Q Serve(g_s), s	4.6	26.4	26.5	12.7	45.6	8.3	5.4	6.3	6.8	22.4	24.2	24.4
Cycle Q Clear(g_c), s	4.6	26.4	26.5	12.7	45.6	8.3	5.4	6.3	6.8	22.4	24.2	24.4
Prop In Lane	1.00		0.18	1.00		1.00	1.00		0.67	1.00		0.32
Lane Grp Cap(c), veh/h	169	995	527	360	1235	539	473	472	439	340	357	333
V/C Ratio(X)	0.68	0.72	0.72	0.87	0.95	0.24	0.19	0.21	0.23	0.86	0.92	0.92
Avail Cap(c_a), veh/h	198	1093	578	487	1438	627	473	472	439	468	492	459
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.55	0.55	0.55	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	65.4	44.1	44.2	61.7	44.3	32.2	39.5	39.8	40.0	54.7	55.4	55.5
Incr Delay (d2), s/veh	4.9	1.6	3.1	6.0	7.9	0.0	0.9	1.0	1.2	8.7	15.2	17.2
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	11.2	12.1	5.8	20.9	3.1	2.5	2.9	2.9	10.7	12.7	12.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	70.4	45.8	47.3	67.8	52.2	32.3	40.4	40.8	41.2	63.5	70.6	72.7
LnGrp LOS	E	D	D	E	D	C	D	D	D	E	E	E
Approach Vol, veh/h	1207			1621			292			927		
Approach Delay, s/veh	48.6			53.6			40.8			69.0		
Approach LOS	D			D			D			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.6	46.2		42.4	11.8	54.0		31.8				
Change Period (Y+Rc), s	4.9	4.9		4.9	4.9	4.9		4.9				
Max Green Setting (Gmax), s	9.9	45.3		18.1	8.1	57.1		37.1				
Max Q Clear Time (g_c+14.7), s	14.7	28.5		8.8	6.6	47.6		26.4				
Green Ext Time (p_c), s	0.0	1.3		0.1	0.0	1.5		0.5				

Intersection Summary

HCM 6th Ctrl Delay 54.7

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 12: US 101 SB Ramps & Guerneville Rd

Lance Drive Residential TIA
Existing PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑					↑	↑	↑
Traffic Volume (veh/h)	0	1103	538	291	1343	0	0	0	0	289	63	300
Future Volume (veh/h)	0	1103	538	291	1343	0	0	0	0	289	63	300
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1856	1856	1856	1856	0				1856	1856	1856
Adj Flow Rate, veh/h	0	1137	230	300	1385	0				344	0	270
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	1393	416	346	1449	0				1842	0	820
Arrive On Green	0.00	0.28	0.28	0.10	0.41	0.00				0.52	0.00	0.52
Sat Flow, veh/h	0	5233	1514	3428	3618	0				3534	0	1572
Grp Volume(v), veh/h	0	1137	230	300	1385	0				344	0	270
Grp Sat Flow(s),veh/h/ln	0	1689	1514	1714	1763	0				1767	0	1572
Q Serve(g_s), s	0.0	29.4	18.2	12.1	53.4	0.0				7.2	0.0	13.9
Cycle Q Clear(g_c), s	0.0	29.4	18.2	12.1	53.4	0.0				7.2	0.0	13.9
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1393	416	346	1449	0				1842	0	820
V/C Ratio(X)	0.00	0.82	0.55	0.87	0.96	0.00				0.19	0.00	0.33
Avail Cap(c_a), veh/h	0	2066	617	541	2118	0				1842	0	820
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.58	0.58	0.79	0.79	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	47.4	43.4	62.0	40.0	0.0				17.8	0.0	19.4
Incr Delay (d2), s/veh	0.0	0.6	0.2	4.5	6.0	0.0				0.2	0.0	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	12.3	6.8	5.5	23.8	0.0				2.9	0.0	5.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	48.0	43.6	66.6	46.0	0.0				18.0	0.0	20.4
LnGrp LOS	A	D	D	E	D	A				B	A	C
Approach Vol, veh/h		1367			1685						614	
Approach Delay, s/veh		47.3			49.6						19.1	
Approach LOS		D			D						B	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	9.0	43.4		77.6		62.4						
Change Period (Y+Rc), s	4.9	4.9		4.6		4.9						
Max Green Setting (Gmax), s	22.5	57.1		46.4		84.1						
Max Q Clear Time (g_c+I14, s	14.1	31.4		15.9		55.4						
Green Ext Time (p_c), s	0.0	1.6		0.1		2.2						

Intersection Summary

HCM 6th Ctrl Delay 43.6
HCM 6th LOS D

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 13: US 101 NB Ramps & Guerneville Rd/Steele Ln

Lance Drive Residential TIA
Existing PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↑↑			↑↑↑		↔	↔	↔			
Traffic Volume (veh/h)	376	1016	0	0	983	232	651	1	329	0	0	0
Future Volume (veh/h)	376	1016	0	0	983	232	651	1	329	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1856	1856	0	0	1856	1856	1856	1856	1856			
Adj Flow Rate, veh/h	392	1058	0	0	1024	214	751	0	156			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	3	3	0	0	3	3	3	3	3			
Cap, veh/h	1399	2495	0	0	1106	231	793	0	353			
Arrive On Green	0.82	1.00	0.00	0.00	0.26	0.26	0.22	0.00	0.22			
Sat Flow, veh/h	3428	3618	0	0	4346	872	3534	0	1572			
Grp Volume(v), veh/h	392	1058	0	0	827	411	751	0	156			
Grp Sat Flow(s),veh/h/ln	1714	1763	0	0	1689	1674	1767	0	1572			
Q Serve(g_s), s	3.8	0.0	0.0	0.0	33.4	33.5	29.3	0.0	12.0			
Cycle Q Clear(g_c), s	3.8	0.0	0.0	0.0	33.4	33.5	29.3	0.0	12.0			
Prop In Lane	1.00		0.00	0.00		0.52	1.00		1.00			
Lane Grp Cap(c), veh/h	1399	2495	0	0	894	443	793	0	353			
V/C Ratio(X)	0.28	0.42	0.00	0.00	0.93	0.93	0.95	0.00	0.44			
Avail Cap(c_a), veh/h	1399	2495	0	0	1209	599	1247	0	555			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.73	0.73	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	8.0	0.0	0.0	0.0	50.1	50.2	53.5	0.0	46.8			
Incr Delay (d2), s/veh	0.0	0.4	0.0	0.0	8.4	15.0	8.1	0.0	0.3			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	1.3	0.1	0.0	0.0	15.0	15.7	13.6	0.0	4.6			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	8.0	0.4	0.0	0.0	58.5	65.1	61.6	0.0	47.1			
LnGrp LOS	A	A	A	A	E	E	E	A	D			
Approach Vol, veh/h	1450			1238			907					
Approach Delay, s/veh	2.4			60.7			59.1					
Approach LOS	A			E			E					
Timer - Assigned Phs	2			5			6			8		
Phs Duration (G+Y+Rc), s	104.0			62.0			42.0			36.0		
Change Period (Y+Rc), s	4.9			4.9			4.9			4.6		
Max Green Setting (Gmax), s	81.1			26.1			50.1			49.4		
Max Q Clear Time (g_c+I1), s	2.0			5.8			35.5			31.3		
Green Ext Time (p_c), s	1.5			0.1			1.6			0.1		

Intersection Summary

HCM 6th Ctrl Delay 36.8

HCM 6th LOS D










Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 14: Stony Point Rd/Marlow Rd & W College Ave

Lance Drive Residential TIA
Existing PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	63	236	104	211	331	191	153	738	248	152	803	100
Future Volume (veh/h)	63	236	104	211	331	191	153	738	248	152	803	100
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	66	248	66	222	348	133	161	777	128	160	845	96
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	461	326	85	585	471	177	186	902	916	253	937	106
Arrive On Green	0.26	0.12	0.12	0.33	0.19	0.19	0.11	0.26	0.26	0.14	0.29	0.29
Sat Flow, veh/h	1767	2755	716	1767	2495	936	1767	3526	1544	1767	3184	362
Grp Volume(v), veh/h	66	157	157	222	244	237	161	777	128	160	468	473
Grp Sat Flow(s),veh/h/ln	1767	1763	1709	1767	1763	1669	1767	1763	1544	1767	1763	1783
Q Serve(g_s), s	4.0	12.0	12.5	13.5	18.2	18.8	12.6	29.5	2.0	11.9	35.7	35.7
Cycle Q Clear(g_c), s	4.0	12.0	12.5	13.5	18.2	18.8	12.6	29.5	2.0	11.9	35.7	35.7
Prop In Lane	1.00		0.42	1.00		0.56	1.00		1.00	1.00		0.20
Lane Grp Cap(c), veh/h	461	208	202	585	332	315	186	902	916	253	518	524
V/C Ratio(X)	0.14	0.75	0.78	0.38	0.73	0.75	0.87	0.86	0.14	0.63	0.90	0.90
Avail Cap(c_a), veh/h	461	327	317	585	501	474	249	1100	1003	274	575	582
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.52	0.52	0.52	1.00	1.00	1.00	0.52	0.52	0.52
Uniform Delay (d), s/veh	39.7	59.7	59.9	35.8	53.5	53.7	61.7	49.7	4.4	56.5	47.5	47.5
Incr Delay (d2), s/veh	0.1	5.4	6.4	0.2	1.7	1.9	21.0	6.1	0.1	2.2	9.7	9.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	5.6	5.7	5.8	8.1	8.0	6.7	13.5	0.8	5.4	16.7	16.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.9	65.1	66.3	36.0	55.1	55.7	82.7	55.8	4.4	58.7	57.1	57.0
LnGrp LOS	D	E	E	D	E	E	F	E	A	E	E	E
Approach Vol, veh/h	380			703			1066			1101		
Approach Delay, s/veh	61.2			49.3			53.7			57.3		
Approach LOS	E			D			D			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	51.7	21.9	20.0	46.5	41.8	31.7	25.4	41.1				
Change Period (Y+Rc), s	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3				
Max Green Setting (Gmax), s	27.4	26.0	19.7	45.7	13.6	39.8	21.7	43.7				
Max Q Clear Time (g_c+11.5), s	14.5	14.5	14.6	37.7	6.0	20.8	13.9	31.5				
Green Ext Time (p_c), s	0.5	1.2	0.2	3.5	0.1	2.6	0.2	4.4				

Intersection Summary

HCM 6th Ctrl Delay 54.9
HCM 6th LOS D









Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary 15: N Dutton Ave & W College Ave

Lance Drive Residential TIA
Existing PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	76	558	96	180	747	156	134	314	124	288	483	132
Future Volume (veh/h)	76	558	96	180	747	156	134	314	124	288	483	132
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	79	581	88	188	778	144	140	327	95	300	503	118
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	99	640	97	221	844	156	605	392	112	719	594	139
Arrive On Green	0.06	0.21	0.21	0.13	0.28	0.28	0.34	0.15	0.15	0.41	0.21	0.21
Sat Flow, veh/h	1767	3063	463	1767	2961	548	1767	2692	768	1767	2825	659
Grp Volume(v), veh/h	79	334	335	188	463	459	140	212	210	300	313	308
Grp Sat Flow(s),veh/h/ln	1767	1763	1763	1767	1763	1746	1767	1763	1697	1767	1763	1721
Q Serve(g_s), s	5.7	24.0	24.2	13.5	33.1	33.1	7.4	15.2	15.7	15.8	22.1	22.4
Cycle Q Clear(g_c), s	5.7	24.0	24.2	13.5	33.1	33.1	7.4	15.2	15.7	15.8	22.1	22.4
Prop In Lane	1.00		0.26	1.00		0.31	1.00		0.45	1.00		0.38
Lane Grp Cap(c), veh/h	99	369	368	221	502	498	605	257	247	719	371	362
V/C Ratio(X)	0.80	0.91	0.91	0.85	0.92	0.92	0.23	0.83	0.85	0.42	0.84	0.85
Avail Cap(c_a), veh/h	150	462	462	394	706	700	605	462	445	719	517	504
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.82	0.82	0.82	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	60.6	50.2	50.2	55.7	45.1	45.1	30.5	53.9	54.1	27.5	49.3	49.4
Incr Delay (d2), s/veh	7.1	14.1	14.7	3.5	11.6	11.7	0.1	2.6	3.1	0.1	6.6	7.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	11.9	12.0	6.2	15.9	15.8	3.1	6.9	6.9	6.6	10.2	10.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	67.7	64.2	64.9	59.2	56.7	56.8	30.6	56.5	57.3	27.7	55.8	56.7
LnGrp LOS	E	E	E	E	E	E	C	E	E	C	E	E
Approach Vol, veh/h	748		1110				562		921			
Approach Delay, s/veh	64.9		57.2				50.3		47.0			
Approach LOS	E		E				D		D			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	30.2	31.1	47.5	31.2	10.3	40.9	55.9	22.8				
Change Period (Y+Rc), s	3.9	* 3.9	3.0	3.9	3.0	3.9	3.0	3.9				
Max Green Setting (Gmax), s	29.0	* 34	15.0	38.1	11.0	52.1	19.0	34.1				
Max Q Clear Time (g_c+11.5), s	15.5	26.2	9.4	24.4	7.7	35.1	17.8	17.7				
Green Ext Time (p_c), s	0.1	1.0	0.0	1.1	0.0	1.9	0.0	0.8				

Intersection Summary

HCM 6th Ctrl Delay 54.9

HCM 6th LOS D

Notes





User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection

Intersection Delay, s/veh 7.2

Intersection LOS A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	0	0	73	0	0	0	61	0	0
Future Vol, veh/h	0	0	0	0	0	73	0	0	0	61	0	0
Peak Hour Factor	0.86	0.86	0.92	0.92	0.86	0.86	0.92	0.92	0.92	0.86	0.92	0.86
Heavy Vehicles, %	3	3	2	2	3	3	2	2	2	3	2	3
Mvmt Flow	0	0	0	0	0	85	0	0	0	71	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0























Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	0	6.8	0	7.7
HCM LOS	-	A	-	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	0%	0%	100%
Vol Thru, %	100%	100%	0%	0%
Vol Right, %	0%	0%	100%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	0	0	73	61
LT Vol	0	0	0	61
Through Vol	0	0	0	0
RT Vol	0	0	73	0
Lane Flow Rate	0	0	85	71
Geometry Grp	1	1	1	1
Degree of Util (X)	0	0	0.082	0.085
Departure Headway (Hd)	4.136	4.14	3.474	4.299
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	0	0	1025	836
Service Time	2.17	2.19	1.517	2.313
HCM Lane V/C Ratio	0	0	0.083	0.085
HCM Control Delay	7.2	7.2	6.8	7.7
HCM Lane LOS	N	N	A	A
HCM 95th-tile Q	0	0	0.3	0.3

HCM 6th Signalized Intersection Summary







1: Marlow Rd & Marlow Ct/W Steele Ln

Lance Drive Residential TIA
Existing Plus Project AM (95-120 Seconds)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	3	6	210	2	180	1	498	214	130	480	2
Future Volume (veh/h)	1	3	6	210	2	180	1	498	214	130	480	2
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.96	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	1	3	0	245	0	132	1	579	166	151	558	2
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	10	31	0	1734	0	908	2	793	1110	157	1117	4
Arrive On Green	0.02	0.02	0.00	0.49	0.00	0.49	0.00	0.23	0.23	0.09	0.31	0.31
Sat Flow, veh/h	458	1374	0	3534	0	1566	1767	3526	1505	1767	3603	13
Grp Volume(v), veh/h	4	0	0	245	0	132	1	579	166	151	273	287
Grp Sat Flow(s),veh/h/ln	1833	0	0	1767	0	1566	1767	1763	1505	1767	1763	1853
Q Serve(g_s), s	0.2	0.0	0.0	4.2	0.0	0.0	0.1	16.8	3.9	9.4	13.9	13.9
Cycle Q Clear(g_c), s	0.2	0.0	0.0	4.2	0.0	0.0	0.1	16.8	3.9	9.4	13.9	13.9
Prop In Lane	0.25		0.00	1.00		1.00	1.00		1.00	1.00		0.01
Lane Grp Cap(c), veh/h	41	0	0	1734	0	908	2	793	1110	157	546	574
V/C Ratio(X)	0.10	0.00	0.00	0.14	0.00	0.15	0.41	0.73	0.15	0.96	0.50	0.50
Avail Cap(c_a), veh/h	317	0	0	1734	0	908	80	1026	1209	157	585	615
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.64	0.64	0.64	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.7	0.0	0.0	15.3	0.0	10.6	54.9	39.5	5.0	49.9	31.0	31.0
Incr Delay (d2), s/veh	1.0	0.0	0.0	0.2	0.0	0.3	59.3	1.2	0.0	59.4	0.7	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.0	1.7	0.0	1.5	0.1	7.3	3.8	6.7	5.9	6.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	53.7	0.0	0.0	15.5	0.0	10.9	114.2	40.8	5.0	109.3	31.7	31.7
LnGrp LOS	D	A	A	B	A	B	F	D	A	F	C	C
Approach Vol, veh/h	4			377				746				711
Approach Delay, s/veh	53.7			13.9				32.9				48.2
Approach LOS	D			B				C				D
Timer - Assigned Phs	2		3	4		6		7	8			
Phs Duration (G+Y+Rc), s	58.6		5.1	39.0		7.4		14.7	29.4			
Change Period (Y+Rc), s	4.6		4.9	4.9		4.9		4.9	4.6			
Max Green Setting (Gmax), s	30.2		5.0	36.5		19.0		9.8	32.0			
Max Q Clear Time (g_c+I1), s	6.2		2.1	15.9		2.2		11.4	18.8			
Green Ext Time (p_c), s	1.3		0.0	3.2		0.0		0.0	3.7			
Intersection Summary												
HCM 6th Ctrl Delay	35.0											
HCM 6th LOS	C											
Notes												
User approved pedestrian interval to be less than phase max green.												
User approved volume balancing among the lanes for turning movement.												






















HCM 6th TWSC
2: Iroquois St/Apple Valley Ln & W Steele Ln

Lance Drive Residential TIA
Existing Plus Project AM (95-120 Seconds)

Intersection												
Int Delay, s/veh	4.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	26	349	48	16	295	16	52	5	34	14	5	38
Future Vol, veh/h	26	349	48	16	295	16	52	5	34	14	5	38
Conflicting Peds, #/hr	12	0	24	24	0	12	4	0	4	4	0	4
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	60	-	-	80	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	31	420	58	19	355	19	63	6	41	17	6	46
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	386	0	0	502	0	0	968	959	477	954	979	381
Stage 1	-	-	-	-	-	-	535	535	-	415	415	-
Stage 2	-	-	-	-	-	-	433	424	-	539	564	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1167	-	-	1057	-	-	232	256	586	237	249	664
Stage 1	-	-	-	-	-	-	527	522	-	613	591	-
Stage 2	-	-	-	-	-	-	599	585	-	525	507	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1154	-	-	1033	-	-	199	236	570	205	230	654
Mov Cap-2 Maneuver	-	-	-	-	-	-	199	236	-	205	230	-
Stage 1	-	-	-	-	-	-	501	496	-	590	574	-
Stage 2	-	-	-	-	-	-	539	568	-	467	482	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.5			0.4			27.7			16.4		
HCM LOS							D			C		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	266	1154	-	-	1033	-	-	385				
HCM Lane V/C Ratio	0.412	0.027	-	-	0.019	-	-	0.178				
HCM Control Delay (s)	27.7	8.2	-	-	8.6	-	-	16.4				
HCM Lane LOS	D	A	-	-	A	-	-	C				
HCM 95th %tile Q(veh)	1.9	0.1	-	-	0.1	-	-	0.6				

HCM 6th Signalized Intersection Summary 3: Range Ave & W Steele Ln

Lance Drive Residential TIA
Existing Plus Project AM (95-120 Seconds)













												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	406	45	44	265	38	37	170	25	26	142	29
Future Volume (veh/h)	40	406	45	44	265	38	37	170	25	26	142	29
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.95	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	45	461	46	50	301	38	42	193	16	30	161	11
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	753	1196	119	618	1162	147	62	428	35	51	445	30
Arrive On Green	0.72	0.72	0.72	0.72	0.72	0.72	0.04	0.13	0.13	0.03	0.13	0.13
Sat Flow, veh/h	1031	1659	166	884	1611	203	1767	3285	269	1767	3337	226
Grp Volume(v), veh/h	45	0	507	50	0	339	42	103	106	30	84	88
Grp Sat Flow(s),veh/h/ln	1031	0	1825	884	0	1815	1767	1763	1791	1767	1763	1800
Q Serve(g_s), s	1.5	0.0	10.2	2.2	0.0	6.1	2.2	5.1	5.2	1.6	4.1	4.2
Cycle Q Clear(g_c), s	7.6	0.0	10.2	12.4	0.0	6.1	2.2	5.1	5.2	1.6	4.1	4.2
Prop In Lane	1.00		0.09	1.00		0.11	1.00		0.15	1.00		0.13
Lane Grp Cap(c), veh/h	753	0	1315	618	0	1308	62	230	234	51	235	240
V/C Ratio(X)	0.06	0.00	0.39	0.08	0.00	0.26	0.67	0.45	0.46	0.59	0.36	0.37
Avail Cap(c_a), veh/h	753	0	1315	618	0	1308	149	466	473	149	466	476
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.83	0.83	0.83	1.00	1.00	1.00
Uniform Delay (d), s/veh	5.9	0.0	5.1	7.5	0.0	4.6	45.3	38.1	38.2	45.6	37.5	37.5
Incr Delay (d2), s/veh	0.2	0.0	0.9	0.3	0.0	0.5	3.9	0.4	0.4	4.0	0.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	3.3	0.4	0.0	2.0	1.0	2.2	2.2	0.7	1.7	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	6.0	0.0	6.0	7.8	0.0	5.0	49.2	38.6	38.6	49.6	37.8	37.8
LnGrp LOS	A	A	A	A	A	A	D	D	D	D	D	D
Approach Vol, veh/h		552			389			251			202	
Approach Delay, s/veh		6.0			5.4			40.4			39.6	
Approach LOS		A			A			D			D	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		72.1	6.3	16.6		72.1	6.6	16.3				
Change Period (Y+Rc), s		3.6	3.0	3.9		3.6	3.9	* 3.9				
Max Green Setting (Gmax), s		51.4	8.0	25.1		51.4	8.0	* 25				
Max Q Clear Time (g_c+I1), s		12.2	4.2	6.2		14.4	3.6	7.2				
Green Ext Time (p_c), s		1.1	0.0	0.2		0.8	0.0	0.3				
Intersection Summary												
HCM 6th Ctrl Delay			16.9									
HCM 6th LOS			B									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

HCM 6th Signalized Intersection Summary

4: Marlow Rd & Guerneville Rd

Lance Drive Residential TIA
Existing Plus Project AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	109	445	141	166	284	90	124	463	172	111	484	80
Future Volume (veh/h)	109	445	141	166	284	90	124	463	172	111	484	80
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	118	484	108	180	309	68	135	503	73	121	526	74
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	147	676	436	169	600	130	154	675	445	213	695	97
Arrive On Green	0.08	0.19	0.19	0.10	0.21	0.21	0.09	0.19	0.19	0.12	0.22	0.22
Sat Flow, veh/h	1767	3526	1558	1767	2876	624	1767	3526	1540	1767	3096	434
Grp Volume(v), veh/h	118	484	108	180	188	189	135	503	73	121	299	301
Grp Sat Flow(s),veh/h/ln	1767	1763	1558	1767	1763	1737	1767	1763	1540	1767	1763	1767
Q Serve(g_s), s	6.2	12.2	2.0	9.1	9.0	9.2	7.2	12.8	0.0	6.1	15.0	15.2
Cycle Q Clear(g_c), s	6.2	12.2	2.0	9.1	9.0	9.2	7.2	12.8	0.0	6.1	15.0	15.2
Prop In Lane	1.00		1.00	1.00		0.36	1.00		1.00	1.00		0.25
Lane Grp Cap(c), veh/h	147	676	436	169	368	362	154	675	445	213	396	396
V/C Ratio(X)	0.80	0.72	0.25	1.06	0.51	0.52	0.87	0.75	0.16	0.57	0.75	0.76
Avail Cap(c_a), veh/h	177	965	564	169	475	468	154	1065	616	213	557	558
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.99	0.99	0.99	0.61	0.61	0.61	0.91	0.91	0.91
Uniform Delay (d), s/veh	42.8	36.0	5.2	42.9	33.3	33.4	42.8	36.2	25.3	39.5	34.4	34.5
Incr Delay (d2), s/veh	19.6	1.5	0.3	86.6	4.9	5.3	26.9	1.0	0.1	3.2	3.4	3.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	5.2	1.3	7.9	4.2	4.3	4.2	5.4	1.2	2.8	6.6	6.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	62.4	37.4	5.5	129.6	38.2	38.7	69.8	37.3	25.4	42.7	37.8	38.0
LnGrp LOS	E	D	A	F	D	D	E	D	C	D	D	D
Approach Vol, veh/h	710			557			711			721		
Approach Delay, s/veh	36.7			67.9			42.2			38.7		
Approach LOS	D			E			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	4.8	23.9	13.6	26.6	13.2	25.5	16.7	23.5				
Change Period (Y+Rc), s	5.7	* 5.7	5.3	5.3	5.3	5.7	5.3	5.3				
Max Green Setting (Gmax), s	26	* 26	8.3	30.0	9.5	25.6	9.6	28.7				
Max Q Clear Time (g_c+I1), s	14.2	14.2	9.2	17.2	8.2	11.2	8.1	14.8				
Green Ext Time (p_c), s	0.0	2.6	0.0	2.9	0.0	1.7	0.0	2.8				

Intersection Summary

HCM 6th Ctrl Delay 45.1

HCM 6th LOS D

Notes







User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary 5: Ridley Ave & Guerneville Rd

Lance Drive Residential TIA
Existing Plus Project AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	692	25	62	480	11	36	4	58	15	4	15
Future Volume (veh/h)	20	692	25	62	480	11	36	4	58	15	4	15
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	0.98		0.96	0.98		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	22	778	21	70	539	8	40	4	8	17	4	2
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	784	2914	79	604	2957	44	166	19	22	166	36	13
Arrive On Green	0.83	0.83	0.83	1.00	1.00	1.00	0.10	0.10	0.10	0.10	0.10	0.10
Sat Flow, veh/h	851	3504	95	674	3556	53	1035	204	225	1045	375	135
Grp Volume(v), veh/h	22	391	408	70	267	280	52	0	0	23	0	0
Grp Sat Flow(s),veh/h/ln	851	1763	1836	674	1763	1846	1463	0	0	1555	0	0
Q Serve(g_s), s	0.4	4.6	4.6	0.7	0.0	0.0	1.9	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.4	4.6	4.6	5.2	0.0	0.0	3.0	0.0	0.0	1.1	0.0	0.0
Prop In Lane	1.00		0.05	1.00		0.03	0.77		0.15	0.74		0.09
Lane Grp Cap(c), veh/h	784	1466	1527	604	1466	1535	207	0	0	215	0	0
V/C Ratio(X)	0.03	0.27	0.27	0.12	0.18	0.18	0.25	0.00	0.00	0.11	0.00	0.00
Avail Cap(c_a), veh/h	784	1466	1527	604	1466	1535	579	0	0	594	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.92	0.92	0.92	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	1.4	1.7	1.7	0.2	0.0	0.0	40.1	0.0	0.0	39.3	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.4	0.4	0.0	0.0	0.0	0.2	0.0	0.0	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.7	0.7	0.0	0.0	0.0	1.2	0.0	0.0	0.5	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	1.4	2.1	2.1	0.2	0.0	0.0	40.3	0.0	0.0	39.4	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	D	A	A	D	A	A
Approach Vol, veh/h	821					617		52		23		
Approach Delay, s/veh	2.1					0.0		40.3		39.4		
Approach LOS	A					A		D		D		
Timer - Assigned Phs	2		4			6		8				
Phs Duration (G+Y+Rc), s	82.9		12.1			82.9		12.1				
Change Period (Y+Rc), s	3.9		3.0			3.9		3.0				
Max Green Setting (Gmax), s	54.1		34.0			54.1		34.0				
Max Q Clear Time (g_c+I1), s	6.6		3.1			7.2		5.0				
Green Ext Time (p_c), s	1.5		0.0			1.2		0.1				
Intersection Summary												
HCM 6th Ctrl Delay			3.1									
HCM 6th LOS			A									

HCM 6th Signalized Intersection Summary

6: Lance Dr & Guerneville Rd

Lance Drive Residential TIA
Existing Plus Project AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	39	718	24	22	432	81	12	47	60	163	89	107
Future Volume (veh/h)	39	718	24	22	432	81	12	47	60	163	89	107
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	46	855	27	26	514	70	14	56	47	194	106	117
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	78	946	30	65	929	405	75	265	200	258	118	125
Arrive On Green	0.01	0.09	0.09	0.01	0.09	0.09	0.29	0.29	0.29	0.29	0.29	0.29
Sat Flow, veh/h	1767	3485	110	1767	3526	1536	112	899	678	687	400	424
Grp Volume(v), veh/h	46	432	450	26	514	70	117	0	0	417	0	0
Grp Sat Flow(s), veh/h/ln	1767	1763	1833	1767	1763	1536	1689	0	0	1510	0	0
Q Serve(g_s), s	2.5	23.1	23.1	1.4	13.3	4.0	0.0	0.0	0.0	20.6	0.0	0.0
Cycle Q Clear(g_c), s	2.5	23.1	23.1	1.4	13.3	4.0	4.9	0.0	0.0	25.5	0.0	0.0
Prop In Lane	1.00		0.06	1.00		1.00	0.12		0.40	0.47		0.28
Lane Grp Cap(c), veh/h	78	478	497	65	929	405	540	0	0	500	0	0
V/C Ratio(X)	0.59	0.90	0.90	0.40	0.55	0.17	0.22	0.00	0.00	0.83	0.00	0.00
Avail Cap(c_a), veh/h	125	737	766	143	1510	658	615	0	0	569	0	0
HCM Platoon Ratio	0.33	0.33	0.33	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.97	0.97	0.97	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	45.9	42.0	42.0	45.9	38.0	33.8	25.4	0.0	0.0	32.3	0.0	0.0
Incr Delay (d2), s/veh	2.6	7.3	7.0	1.4	2.3	0.9	0.1	0.0	0.0	8.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	11.8	12.2	0.6	6.5	1.6	2.0	0.0	0.0	10.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.5	49.3	49.1	47.3	40.3	34.7	25.4	0.0	0.0	40.6	0.0	0.0
LnGrp LOS	D	D	D	D	D	C	C	A	A	D	A	A
Approach Vol, veh/h	928			610			117			417		
Approach Delay, s/veh	49.1			40.0			25.4			40.6		
Approach LOS	D			D			C			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.8	31.1		32.6	9.5	30.3		32.6				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		4.6				
Max Green Setting (Gmax), s	39.7	39.7		32.4	6.7	40.7		32.4				
Max Q Clear Time (g_c+11.3), s	25.1	25.1		27.5	4.5	15.3		6.9				
Green Ext Time (p_c), s	0.0	0.7		0.4	0.0	0.6		0.1				

Intersection Summary

HCM 6th Ctrl Delay 43.4
HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

7: N Dutton Ave/Westberry Dr & Guerneville Rd

Lance Drive Residential TIA
Existing Plus Project AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	900	135	234	474	7	92	2	363	20	3	6
Future Volume (veh/h)	3	900	135	234	474	7	92	2	363	20	3	6
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	4	1084	158	282	571	7	112	0	106	24	4	0
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	11	1031	150	1218	2437	30	185	0	641	64	11	0
Arrive On Green	0.01	0.33	0.33	0.36	0.68	0.68	0.05	0.00	0.05	0.04	0.04	0.00
Sat Flow, veh/h	1767	3080	448	3428	3565	44	3534	0	1564	1525	254	0
Grp Volume(v), veh/h	4	619	623	282	282	296	112	0	106	28	0	0
Grp Sat Flow(s), veh/h/ln	1767	1763	1765	1714	1763	1846	1767	0	1564	1779	0	0
Q Serve(g_s), s	0.2	31.8	31.8	5.5	5.7	5.7	2.9	0.0	0.0	1.5	0.0	0.0
Cycle Q Clear(g_c), s	0.2	31.8	31.8	5.5	5.7	5.7	2.9	0.0	0.0	1.5	0.0	0.0
Prop In Lane	1.00		0.25	1.00		0.02	1.00		1.00	0.86		0.00
Lane Grp Cap(c), veh/h	11	590	591	1218	1205	1262	185	0	641	74	0	0
V/C Ratio(X)	0.36	1.05	1.05	0.23	0.23	0.23	0.60	0.00	0.17	0.38	0.00	0.00
Avail Cap(c_a), veh/h	112	590	591	1218	1205	1262	190	0	643	519	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.87	0.87	0.87	0.94	0.94	0.94	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	47.0	31.6	31.6	21.5	5.7	5.7	44.0	0.0	17.9	44.3	0.0	0.0
Incr Delay (d2), s/veh	6.1	48.4	49.6	0.0	0.4	0.4	3.6	0.0	0.0	1.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	20.5	20.7	2.1	1.8	1.9	1.3	0.0	1.4	0.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	53.1	80.0	81.2	21.6	6.1	6.1	47.6	0.0	17.9	45.5	0.0	0.0
LnGrp LOS	D	F	F	C	A	A	D	A	B	D	A	A
Approach Vol, veh/h	1246			860			218			28		
Approach Delay, s/veh	80.5			11.2			33.2			45.5		
Approach LOS	F			B			C			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	39.0	37.1		8.6	5.9	70.2		10.3				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		5.3				
Max Green Setting (Gmax), s	31.8	31.8		27.7	6.0	35.7		5.1				
Max Q Clear Time (g_c+11), s	33.8	33.8		3.5	2.2	7.7		4.9				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	0.4		0.0				

Intersection Summary

HCM 6th Ctrl Delay 50.3

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

8: Herbert St/Coffey Ln & Guerneville Rd

Lance Drive Residential TIA
Existing Plus Project AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	123	1129	29	17	548	36	20	12	15	75	5	148
Future Volume (veh/h)	123	1129	29	17	548	36	20	12	15	75	5	148
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		0.96	1.00		0.93	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	143	1313	33	20	637	39	23	14	1	87	6	39
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	170	1181	30	606	1963	120	64	39	3	144	10	282
Arrive On Green	0.10	0.34	0.34	0.34	0.58	0.58	0.06	0.06	0.06	0.09	0.09	0.09
Sat Flow, veh/h	1767	3509	88	1767	3364	206	1083	659	47	1658	114	1507
Grp Volume(v), veh/h	143	659	687	20	333	343	38	0	0	93	0	39
Grp Sat Flow(s), veh/h/ln	1767	1763	1834	1767	1763	1807	1789	0	0	1773	0	1507
Q Serve(g_s), s	9.2	38.7	38.7	0.9	11.2	11.2	2.3	0.0	0.0	5.8	0.0	2.5
Cycle Q Clear(g_c), s	9.2	38.7	38.7	0.9	11.2	11.2	2.3	0.0	0.0	5.8	0.0	2.5
Prop In Lane	1.00		0.05	1.00		0.11	0.61		0.03	0.94		1.00
Lane Grp Cap(c), veh/h	170	593	617	606	1028	1054	105	0	0	154	0	282
V/C Ratio(X)	0.84	1.11	1.11	0.03	0.32	0.32	0.36	0.00	0.00	0.60	0.00	0.14
Avail Cap(c_a), veh/h	272	593	617	606	1028	1054	389	0	0	402	0	493
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.72	0.72	0.72	0.94	0.94	0.94	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	51.1	38.1	38.2	25.1	12.3	12.3	52.0	0.0	0.0	50.6	0.0	39.4
Incr Delay (d2), s/veh	4.8	66.4	66.6	0.0	0.8	0.8	0.8	0.0	0.0	1.4	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.2	26.9	28.0	0.4	4.3	4.5	1.1	0.0	0.0	2.6	0.0	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	56.0	104.6	104.8	25.1	13.1	13.1	52.8	0.0	0.0	52.0	0.0	39.5
LnGrp LOS	E	F	F	C	B	B	D	A	A	D	A	D
Approach Vol, veh/h	1489			696			38			132		
Approach Delay, s/veh	100.0			13.4			52.8			48.3		
Approach LOS	F			B			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	44.7	44.0		14.9	16.4	72.4		11.4				
Change Period (Y+Rc), s	5.3	5.3		4.9	5.3	5.3		4.6				
Max Green Setting (Gmax), s	5.3	38.7		26.1	17.7	26.1		25.0				
Max Q Clear Time (g_c+1/2g), s	40.7	40.7		7.8	11.2	13.2		4.3				
Green Ext Time (p_c), s	0.0	0.0		0.1	0.0	0.5		0.0				
Intersection Summary												
HCM 6th Ctrl Delay	70.8											
HCM 6th LOS	E											

HCM 6th Signalized Intersection Summary

9: Range Ave & Guerneville Rd

Lance Drive Residential TIA
Existing Plus Project AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	141	761	145	69	422	5	129	86	72	28	98	102
Future Volume (veh/h)	141	761	145	69	422	5	129	86	72	28	98	102
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.96	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	150	810	0	73	449	0	79	173	8	30	104	9
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	249	907		95	601		167	333	15	127	236	20
Arrive On Green	0.14	0.26	0.00	0.05	0.17	0.00	0.09	0.09	0.09	0.07	0.07	0.07
Sat Flow, veh/h	1767	3618	0	1767	3618	0	1767	3514	161	1767	3274	279
Grp Volume(v), veh/h	150	810	0	73	449	0	79	91	90	30	55	58
Grp Sat Flow(s), veh/h/ln	1767	1763	0	1767	1763	0	1767	1856	1819	1767	1763	1791
Q Serve(g_s), s	7.6	21.0	0.0	3.9	11.5	0.0	4.0	4.4	4.5	1.5	2.9	2.9
Cycle Q Clear(g_c), s	7.6	21.0	0.0	3.9	11.5	0.0	4.0	4.4	4.5	1.5	2.9	2.9
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.09	1.00		0.16
Lane Grp Cap(c), veh/h	249	907		95	601		167	176	172	127	127	129
V/C Ratio(X)	0.60	0.89		0.77	0.75		0.47	0.52	0.52	0.24	0.44	0.45
Avail Cap(c_a), veh/h	249	1058		112	1058		614	645	632	130	130	132
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.79	0.79	0.00	0.97	0.97	0.00	1.00	1.00	1.00	0.87	0.87	0.87
Uniform Delay (d), s/veh	38.3	34.0	0.0	44.3	37.5	0.0	40.8	40.9	41.0	41.6	42.2	42.3
Incr Delay (d2), s/veh	2.3	6.5	0.0	18.5	8.0	0.0	0.8	0.9	0.9	0.3	0.8	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	9.4	0.0	2.2	5.5	0.0	1.8	2.0	2.0	0.7	1.2	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.6	40.6	0.0	62.8	45.5	0.0	41.5	41.8	41.9	41.9	43.0	43.1
LnGrp LOS	D	D		E	D		D	D	D	D	D	D
Approach Vol, veh/h	960		A	522		A	260			143		
Approach Delay, s/veh	40.6			47.9			41.7			42.8		
Approach LOS	D			D			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	29.7			12.1	18.7	21.5		13.6				
Change Period (Y+Rc), s	5.3	5.3		5.3	5.3	5.3		4.6				
Max Green Setting (Gmax), s	28.5			7.0	6.0	28.5		33.0				
Max Q Clear Time (g_c+15), s	23.0			4.9	9.6	13.5		6.5				
Green Ext Time (p_c), s	0.0	0.7		0.0	0.0	0.5		0.1				

Intersection Summary

HCM 6th Ctrl Delay	42.9
HCM 6th LOS	D

Notes












- User approved pedestrian interval to be less than phase max green.
- User approved volume balancing among the lanes for turning movement.
- Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

10: Guerneville Rd & Steele Wy

Lance Drive Residential TIA
Existing Plus Project AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	794	42	51	463	5	24	10	53	382	16	9
Future Volume (veh/h)	25	794	42	51	463	5	24	10	53	382	16	9
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	28	902	28	58	526	5	19	22	5	447	0	4
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	804	1978	966	218	608	6	96	100	184	515	0	943
Arrive On Green	0.45	0.56	0.56	0.06	0.17	0.17	0.05	0.05	0.05	0.15	0.00	0.15
Sat Flow, veh/h	1767	3526	1571	3428	3577	34	1767	1856	1558	3534	0	1566
Grp Volume(v), veh/h	28	902	28	58	259	272	19	22	5	447	0	4
Grp Sat Flow(s),veh/h/ln	1767	1763	1571	1714	1763	1848	1767	1856	1558	1767	0	1566
Q Serve(g_s), s	1.0	16.6	0.8	1.8	15.7	15.7	1.1	1.2	0.3	13.6	0.0	0.0
Cycle Q Clear(g_c), s	1.0	16.6	0.8	1.8	15.7	15.7	1.1	1.2	0.3	13.6	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.02	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	804	1978	966	218	300	314	96	100	184	515	0	943
V/C Ratio(X)	0.03	0.46	0.03	0.27	0.86	0.86	0.20	0.22	0.03	0.87	0.00	0.00
Avail Cap(c_a), veh/h	804	1978	966	218	476	499	434	455	482	868	0	1099
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.87	0.87	0.87	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	16.6	14.2	8.3	49.1	44.4	44.4	49.7	49.8	43.0	46.0	0.0	8.8
Incr Delay (d2), s/veh	0.0	0.7	0.0	0.2	5.7	5.5	0.4	0.4	0.0	2.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	6.4	0.3	0.8	7.2	7.6	0.5	0.6	0.1	6.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.6	14.9	8.3	49.3	50.1	49.9	50.1	50.2	43.0	48.3	0.0	8.8
LnGrp LOS	B	B	A	D	D	D	D	D	D	D	A	A
Approach Vol, veh/h	958				589		46				451	
Approach Delay, s/veh	14.8				49.9		49.4				48.0	
Approach LOS	B				D		D				D	
Timer - Assigned Phs	1	2	4		5	6	8					
Phs Duration (G+Y+Rc), s	1.9	66.6	20.9		54.9	23.6	10.5					
Change Period (Y+Rc), s	4.9	4.9	4.9		4.9	4.9	4.6					
Max Green Setting (Gmax), s	7.0	29.7	27.0		7.0	29.7	27.0					
Max Q Clear Time (g_c+13.5), s	18.6	18.6	15.6		3.0	17.7	3.2					
Green Ext Time (p_c), s	0.0	1.1	0.1		0.0	0.4	0.0					

Intersection Summary

HCM 6th Ctrl Delay 33.0
HCM 6th LOS C

Notes

User approved pedestrian interval to be less than phase max green.
User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

11: Cleveland Ave & Guerneville Rd

Lance Drive Residential TIA
Existing Plus Project AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↑↑↓		↰↱	↑↑	↱	↰	↑↓		↰	↱↱	
Traffic Volume (veh/h)	52	1179	32	172	826	184	28	87	141	223	63	34
Future Volume (veh/h)	52	1179	32	172	826	184	28	87	141	223	63	34
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	57	1296	32	189	908	118	31	96	48	245	69	25
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	242	1413	35	257	996	434	595	780	365	368	134	49
Arrive On Green	0.07	0.28	0.28	0.05	0.19	0.19	0.34	0.34	0.34	0.10	0.10	0.10
Sat Flow, veh/h	3428	5081	125	3428	3526	1536	1767	2317	1083	3534	1293	468
Grp Volume(v), veh/h	57	861	467	189	908	118	31	71	73	245	0	94
Grp Sat Flow(s), veh/h/ln	1714	1689	1830	1714	1763	1536	1767	1763	1637	1767	0	1761
Q Serve(g_s), s	1.5	23.5	23.5	5.2	24.0	6.2	1.1	2.7	2.9	6.3	0.0	4.8
Cycle Q Clear(g_c), s	1.5	23.5	23.5	5.2	24.0	6.2	1.1	2.7	2.9	6.3	0.0	4.8
Prop In Lane	1.00		0.07	1.00		1.00	1.00		0.66	1.00		0.27
Lane Grp Cap(c), veh/h	242	939	509	257	996	434	595	593	551	368	0	183
V/C Ratio(X)	0.24	0.92	0.92	0.74	0.91	0.27	0.05	0.12	0.13	0.67	0.00	0.51
Avail Cap(c_a), veh/h	253	1034	560	328	1158	504	595	593	551	1008	0	502
HCM Platoon Ratio	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.78	0.78	0.78	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	41.7	33.2	33.2	44.2	37.4	30.2	21.3	21.8	21.9	41.0	0.0	40.3
Incr Delay (d2), s/veh	0.2	11.3	18.2	3.2	7.4	0.1	0.2	0.4	0.5	0.8	0.0	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	10.7	12.6	2.3	11.6	2.3	0.5	1.2	1.2	2.7	0.0	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.9	44.5	51.4	47.4	44.8	30.3	21.4	22.2	22.4	41.8	0.0	41.1
LnGrp LOS	D	D	D	D	D	C	C	C	C	D	A	D
Approach Vol, veh/h	1385			1215			175			339		
Approach Delay, s/veh	46.7			43.8			22.1			41.6		
Approach LOS	D			D			C			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	2.0	31.3		36.9	11.6	31.7		14.8				
Change Period (Y+Rc), s	4.9	4.9		4.9	4.9	4.9		4.9				
Max Green Setting (Gmax), s	29.1			10.1	7.0	31.2		27.1				
Max Q Clear Time (g_c+11), s	25.5			4.9	3.5	26.0		8.3				
Green Ext Time (p_c), s	0.0	0.9		0.1	0.0	0.9		0.1				

Intersection Summary

HCM 6th Ctrl Delay 43.6

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 12: US 101 SB Ramps & Guerneville Rd

Lance Drive Residential TIA
Existing Plus Project AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑					↑	↑	↑
Traffic Volume (veh/h)	0	1043	506	254	902	0	0	0	0	344	2	281
Future Volume (veh/h)	0	1043	506	254	902	0	0	0	0	344	2	281
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1856	1856	1856	1856	0				1856	1856	1856
Adj Flow Rate, veh/h	0	1172	231	285	1013	0				388	0	278
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89				0.89	0.89	0.89
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	1320	402	352	1463	0				1715	0	763
Arrive On Green	0.00	0.26	0.26	0.10	0.41	0.00				0.49	0.00	0.49
Sat Flow, veh/h	0	5233	1544	3428	3618	0				3534	0	1572
Grp Volume(v), veh/h	0	1172	231	285	1013	0				388	0	278
Grp Sat Flow(s),veh/h/ln	0	1689	1544	1714	1763	0				1767	0	1572
Q Serve(g_s), s	0.0	21.1	12.4	7.7	22.4	0.0				6.0	0.0	10.5
Cycle Q Clear(g_c), s	0.0	21.1	12.4	7.7	22.4	0.0				6.0	0.0	10.5
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1320	402	352	1463	0				1715	0	763
V/C Ratio(X)	0.00	0.89	0.57	0.81	0.69	0.00				0.23	0.00	0.36
Avail Cap(c_a), veh/h	0	1925	587	545	2082	0				1715	0	763
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.32	0.32	0.81	0.81	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	33.8	30.5	41.7	22.8	0.0				14.1	0.0	15.3
Incr Delay (d2), s/veh	0.0	0.9	0.2	2.1	0.2	0.0				0.3	0.0	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	8.5	4.5	3.3	8.8	0.0				2.3	0.0	3.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	34.7	30.7	43.8	23.0	0.0				14.5	0.0	16.6
LnGrp LOS	A	C	C	D	C	A				B	A	B
Approach Vol, veh/h		1403			1298						666	
Approach Delay, s/veh		34.1			27.6						15.4	
Approach LOS		C			C						B	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	4.7	29.7		50.7		44.3						
Change Period (Y+Rc), s	4.9	4.9		4.6		4.9						
Max Green Setting (Gmax), s	5.5	36.1		29.4		56.1						
Max Q Clear Time (g_c+19.7), s	19.7	23.1		12.5		24.4						
Green Ext Time (p_c), s	0.0	1.6		0.1		1.4						

Intersection Summary

HCM 6th Ctrl Delay	27.9
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 13: US 101 NB Ramps & Guerneville Rd/Steele Ln

Lance Drive Residential TIA
Existing Plus Project AM (95-120 Seconds)












Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↑↑			↑↑↑		↰	↰↱	↰			
Traffic Volume (veh/h)	400	987	0	0	791	203	365	1	411	0	0	0
Future Volume (veh/h)	400	987	0	0	791	203	365	1	411	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1856	1856	0	0	1856	1856	1856	1856	1856			
Adj Flow Rate, veh/h	449	1109	0	0	889	200	503	0	200			
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89			
Percent Heavy Veh, %	3	3	0	0	3	3	3	3	3			
Cap, veh/h	1519	2605	0	0	1006	225	569	0	253			
Arrive On Green	0.89	1.00	0.00	0.00	0.24	0.24	0.16	0.00	0.16			
Sat Flow, veh/h	3428	3618	0	0	4284	921	3534	0	1572			
Grp Volume(v), veh/h	449	1109	0	0	728	361	503	0	200			
Grp Sat Flow(s),veh/h/ln	1714	1763	0	0	1689	1661	1767	0	1572			
Q Serve(g_s), s	1.9	0.0	0.0	0.0	19.7	19.9	13.2	0.0	11.6			
Cycle Q Clear(g_c), s	1.9	0.0	0.0	0.0	19.7	19.9	13.2	0.0	11.6			
Prop In Lane	1.00		0.00	0.00		0.55	1.00		1.00			
Lane Grp Cap(c), veh/h	1519	2605	0	0	825	406	569	0	253			
V/C Ratio(X)	0.30	0.43	0.00	0.00	0.88	0.89	0.88	0.00	0.79			
Avail Cap(c_a), veh/h	1519	2605	0	0	1177	579	1094	0	487			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.59	0.59	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	3.1	0.0	0.0	0.0	34.6	34.7	39.0	0.0	38.3			
Incr Delay (d2), s/veh	0.0	0.3	0.0	0.0	4.5	9.2	1.9	0.0	2.1			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.6	0.1	0.0	0.0	8.3	8.8	5.6	0.0	4.4			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	3.1	0.3	0.0	0.0	39.1	43.8	40.8	0.0	40.4			
LnGrp LOS	A	A	A	A	D	D	D	A	D			
Approach Vol, veh/h												
1558												
Approach Delay, s/veh												
1.1												
Approach LOS												
A												
Timer - Assigned Phs												
2												
5												
6												
8												
Phs Duration (G+Y+Rc), s												
75.1												
47.0												
28.1												
19.9												
Change Period (Y+Rc), s												
4.9												
4.9												
4.6												
Max Green Setting (Gmax), s												
56.1												
18.1												
33.1												
29.4												
Max Q Clear Time (g_c+I1), s												
2.0												
3.9												
21.9												
15.2												
Green Ext Time (p_c), s												
1.6												
0.1												
1.3												
0.1												
Intersection Summary												
HCM 6th Ctrl Delay												
22.3												
HCM 6th LOS												
C												

HCM 6th Signalized Intersection Summary 14: Stony Point Rd/Marlow Rd & W College Ave

Lance Drive Residential TIA
Existing Plus Project AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	75	338	135	154	183	117	73	574	159	164	562	65
Future Volume (veh/h)	75	338	135	154	183	117	73	574	159	164	562	65
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	83	376	114	171	203	44	81	638	91	182	624	65
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	365	502	150	435	659	140	104	779	727	214	911	95
Arrive On Green	0.21	0.19	0.19	0.25	0.23	0.23	0.06	0.22	0.22	0.12	0.28	0.28
Sat Flow, veh/h	1767	2661	795	1767	2891	613	1767	3526	1538	1767	3215	334
Grp Volume(v), veh/h	83	247	243	171	122	125	81	638	91	182	342	347
Grp Sat Flow(s),veh/h/ln	1767	1763	1694	1767	1763	1741	1767	1763	1538	1767	1763	1787
Q Serve(g_s), s	3.7	12.6	12.9	7.7	5.5	5.7	4.3	16.4	1.5	9.6	16.4	16.4
Cycle Q Clear(g_c), s	3.7	12.6	12.9	7.7	5.5	5.7	4.3	16.4	1.5	9.6	16.4	16.4
Prop In Lane	1.00		0.47	1.00		0.35	1.00		1.00	1.00		0.19
Lane Grp Cap(c), veh/h	365	332	319	435	402	397	104	779	727	214	500	506
V/C Ratio(X)	0.23	0.74	0.76	0.39	0.30	0.31	0.78	0.82	0.13	0.85	0.68	0.69
Avail Cap(c_a), veh/h	365	482	464	435	508	502	136	891	776	218	527	534
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.51	0.51	0.51	1.00	1.00	1.00	0.63	0.63	0.63
Uniform Delay (d), s/veh	31.4	36.4	36.5	29.9	30.4	30.5	44.1	35.2	4.6	40.9	30.3	30.3
Incr Delay (d2), s/veh	0.3	3.6	4.4	0.3	0.2	0.2	19.2	5.4	0.1	17.8	2.2	2.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	5.5	5.5	3.2	2.3	2.3	2.4	7.3	0.6	5.1	6.9	7.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.7	40.0	40.9	30.2	30.6	30.7	63.3	40.6	4.7	58.7	32.4	32.5
LnGrp LOS	C	D	D	C	C	C	E	D	A	E	C	C
Approach Vol, veh/h	573				418				810			
Approach Delay, s/veh	39.2				30.5				38.9			
Approach LOS	D				C				D			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	28.7	23.2	10.9	32.2	24.9	27.0	16.8	26.3				
Change Period (Y+Rc), s	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3				
Max Green Setting (Gmax), s	26.0	7.3	28.4	10.7	27.4	11.7	24.0					
Max Q Clear Time (g_c+119, s)	14.9	6.3	18.4	5.7	7.7	11.6	18.4					
Green Ext Time (p_c), s	0.1	2.1	0.0	2.8	0.1	1.2	0.0	2.1				

Intersection Summary

HCM 6th Ctrl Delay 37.3

HCM 6th LOS D









Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary 15: N Dutton Ave & W College Ave

Lance Drive Residential TIA
Existing Plus Project AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	84	673	89	81	502	277	75	354	93	204	228	49
Future Volume (veh/h)	84	673	89	81	502	277	75	354	93	204	228	49
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No				No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	90	724	86	87	540	217	81	381	80	219	245	36
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	114	808	96	111	645	258	553	479	100	639	661	96
Arrive On Green	0.06	0.26	0.26	0.06	0.26	0.26	0.31	0.17	0.17	0.36	0.21	0.21
Sat Flow, veh/h	1767	3166	376	1767	2453	982	1767	2893	601	1767	3081	446
Grp Volume(v), veh/h	90	403	407	87	388	369	81	230	231	219	139	142
Grp Sat Flow(s),veh/h/ln	1767	1763	1779	1767	1763	1672	1767	1763	1731	1767	1763	1765
Q Serve(g_s), s	4.8	21.0	21.0	4.6	19.7	19.9	3.1	11.9	12.2	8.6	6.4	6.5
Cycle Q Clear(g_c), s	4.8	21.0	21.0	4.6	19.7	19.9	3.1	11.9	12.2	8.6	6.4	6.5
Prop In Lane	1.00		0.21	1.00		0.59	1.00		0.35	1.00		0.25
Lane Grp Cap(c), veh/h	114	450	454	111	463	439	553	292	287	639	378	378
V/C Ratio(X)	0.79	0.90	0.90	0.79	0.84	0.84	0.15	0.79	0.80	0.34	0.37	0.38
Avail Cap(c_a), veh/h	167	570	575	167	570	540	553	410	403	639	577	578
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.70	0.70	0.70	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.8	34.1	34.2	43.9	33.1	33.1	23.5	38.0	38.1	22.1	31.8	31.9
Incr Delay (d2), s/veh	5.7	9.2	9.3	6.5	7.4	8.1	0.0	4.3	5.2	0.1	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	9.8	9.9	2.2	9.1	8.7	1.3	5.4	5.4	3.4	2.6	2.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.5	43.4	43.4	50.4	40.5	41.3	23.6	42.3	43.3	22.2	32.0	32.1
LnGrp LOS	D	D	D	D	D	D	C	D	D	C	C	C
Approach Vol, veh/h	900		844				542			500		
Approach Delay, s/veh	44.0		41.9				39.9			27.8		
Approach LOS	D		D				D			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.9	28.2	32.7	24.3	9.1	28.9	37.4	19.6				
Change Period (Y+Rc), s	3.9	* 3.9	3.0	3.9	3.0	3.9	3.0	3.9				
Max Green Setting (Gmax), s	9.9	* 31	10.4	31.1	9.0	30.7	19.4	22.1				
Max Q Clear Time (g_c+10), s	10.6	23.0	5.1	8.5	6.8	21.9	10.6	14.2				
Green Ext Time (p_c), s	0.0	1.3	0.0	0.5	0.0	1.3	0.1	0.7				

Intersection Summary

HCM 6th Ctrl Delay 39.7
HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection												
Intersection Delay, s/veh	8.4											
Intersection LOS	A											




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	8	63	0	20	23	57	0	8	55	93	2	3
Future Vol, veh/h	8	63	0	20	23	57	0	8	55	93	2	3
Peak Hour Factor	0.66	0.66	0.92	0.92	0.66	0.66	0.92	0.92	0.92	0.66	0.92	0.66
Heavy Vehicles, %	3	3	2	2	3	3	2	2	2	3	2	3
Mvmt Flow	12	95	0	22	35	86	0	9	60	141	2	5
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.4	8.2	7.5	8.9
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	11%	20%	95%
Vol Thru, %	13%	89%	23%	2%
Vol Right, %	87%	0%	57%	3%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	63	71	100	98
LT Vol	0	8	20	93
Through Vol	8	63	23	2
RT Vol	55	0	57	3
Lane Flow Rate	68	108	143	148
Geometry Grp	1	1	1	1
Degree of Util (X)	0.079	0.139	0.169	0.195
Departure Headway (Hd)	4.156	4.637	4.266	4.761
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	861	773	841	754
Service Time	2.187	2.664	2.291	2.789
HCM Lane V/C Ratio	0.079	0.14	0.17	0.196
HCM Control Delay	7.5	8.4	8.2	8.9
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.3	0.5	0.6	0.7




HCM 6th TWSC
17: Iroquois St & Project Driveway (1)

Lance Drive Residential TIA
Existing Plus Project AM (95-120 Seconds)

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	7	2	70	83	1
Future Vol, veh/h	2	7	2	70	83	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	8	2	76	90	1
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	171	91	91	0	-	0
Stage 1	91	-	-	-	-	-
Stage 2	80	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	819	967	1504	-	-	-
Stage 1	933	-	-	-	-	-
Stage 2	943	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	818	967	1504	-	-	-
Mov Cap-2 Maneuver	818	-	-	-	-	-
Stage 1	932	-	-	-	-	-
Stage 2	943	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	8.9	0.2		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1504	-	929	-	-	
HCM Lane V/C Ratio	0.001	-	0.011	-	-	
HCM Control Delay (s)	7.4	0	8.9	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	




HCM 6th TWSC
18: Iroquois St & Project Driveway (2)

Lance Drive Residential TIA
Existing Plus Project AM (95-120 Seconds)

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	8	3	70	90	0
Future Vol, veh/h	2	8	3	70	90	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	9	3	76	98	0
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	180	98	98	0	-	0
Stage 1	98	-	-	-	-	-
Stage 2	82	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	810	958	1495	-	-	-
Stage 1	926	-	-	-	-	-
Stage 2	941	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	808	958	1495	-	-	-
Mov Cap-2 Maneuver	808	-	-	-	-	-
Stage 1	924	-	-	-	-	-
Stage 2	941	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	8.9	0.3		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1495	-	924	-	-	
HCM Lane V/C Ratio	0.002	-	0.012	-	-	
HCM Control Delay (s)	7.4	0	8.9	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	




HCM 6th TWSC
19: Project Driveway (3) & Lance Dr

Lance Drive Residential TIA
Existing Plus Project AM (95-120 Seconds)

Intersection						
Int Delay, s/veh	1.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	210	1	14	96	4	37
Future Vol, veh/h	210	1	14	96	4	37
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	228	1	15	104	4	40
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	229	0	363	229
Stage 1	-	-	-	-	229	-
Stage 2	-	-	-	-	134	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1339	-	636	810
Stage 1	-	-	-	-	809	-
Stage 2	-	-	-	-	892	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1339	-	628	810
Mov Cap-2 Maneuver	-	-	-	-	628	-
Stage 1	-	-	-	-	809	-
Stage 2	-	-	-	-	881	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	1		9.8		
HCM LOS	A					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	788	-	-	1339	-	
HCM Lane V/C Ratio	0.057	-	-	0.011	-	
HCM Control Delay (s)	9.8	-	-	7.7	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0.2	-	-	0	-	

HCM 6th TWSC
20: Guerneville Rd & Project Driveway (4)























Lance Drive Residential TIA
Existing Plus Project AM (95-120 Seconds)

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	765	545	6	16	8
Future Vol, veh/h	3	765	545	6	16	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	832	592	7	17	9
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	599	0	-	0	1018	300
Stage 1	-	-	-	-	596	-
Stage 2	-	-	-	-	422	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	974	-	-	-	233	696
Stage 1	-	-	-	-	513	-
Stage 2	-	-	-	-	629	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	974	-	-	-	232	696
Mov Cap-2 Maneuver	-	-	-	-	232	-
Stage 1	-	-	-	-	510	-
Stage 2	-	-	-	-	629	-
Approach	EB	WB		SB		
HCM Control Delay, s	0	0		18.2		
HCM LOS				C		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	974	-	-	-	298	
HCM Lane V/C Ratio	0.003	-	-	-	0.088	
HCM Control Delay (s)	8.7	0	-	-	18.2	
HCM Lane LOS	A	A	-	-	C	
HCM 95th %tile Q(veh)	0	-	-	-	0.3	

HCM 6th Signalized Intersection Summary







1: Marlow Rd & Marlow Ct/W Steele Ln

Lance Drive Residential TIA
Existing Plus Project AM (120 Seconds)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	3	6	210	2	180	1	498	214	130	480	2
Future Volume (veh/h)	1	3	6	210	2	180	1	498	214	130	480	2
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.96	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	1	3	0	245	0	132	1	579	166	151	558	2
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	9	26	0	1770	0	946	2	773	1117	182	1147	4
Arrive On Green	0.02	0.02	0.00	0.50	0.00	0.50	0.00	0.22	0.22	0.10	0.32	0.32
Sat Flow, veh/h	458	1374	0	3534	0	1566	1767	3526	1504	1767	3603	13
Grp Volume(v), veh/h	4	0	0	245	0	132	1	579	166	151	273	287
Grp Sat Flow(s),veh/h/ln	1833	0	0	1767	0	1566	1767	1763	1504	1767	1763	1853
Q Serve(g_s), s	0.3	0.0	0.0	4.5	0.0	0.0	0.1	18.4	4.2	10.1	15.0	15.0
Cycle Q Clear(g_c), s	0.3	0.0	0.0	4.5	0.0	0.0	0.1	18.4	4.2	10.1	15.0	15.0
Prop In Lane	0.25		0.00	1.00		1.00	1.00		1.00	1.00		0.01
Lane Grp Cap(c), veh/h	34	0	0	1770	0	946	2	773	1117	182	561	590
V/C Ratio(X)	0.12	0.00	0.00	0.14	0.00	0.14	0.41	0.75	0.15	0.83	0.49	0.49
Avail Cap(c_a), veh/h	231	0	0	1770	0	946	149	1040	1231	517	883	928
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.61	0.61	0.61	1.00	1.00	1.00
Uniform Delay (d), s/veh	57.9	0.0	0.0	16.1	0.0	10.3	59.9	43.8	5.3	52.8	33.0	33.0
Incr Delay (d2), s/veh	1.5	0.0	0.0	0.2	0.0	0.3	57.1	1.3	0.0	9.3	0.7	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.0	1.9	0.0	1.5	0.1	8.1	4.3	4.9	6.4	6.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.4	0.0	0.0	16.2	0.0	10.6	117.0	45.0	5.3	62.1	33.6	33.6
LnGrp LOS	E	A	A	B	A	B	F	D	A	E	C	C
Approach Vol, veh/h	4			377			746			711		
Approach Delay, s/veh	59.4			14.3			36.3			39.7		
Approach LOS	E			B			D			D		
Timer - Assigned Phs	2		3	4		6		7	8			
Phs Duration (G+Y+Rc), s	64.7		5.1	43.1		7.1		17.3	30.9			
Change Period (Y+Rc), s	4.6		4.9	4.9		4.9		4.9	4.6			
Max Green Setting (Gmax), s	15.4		10.1	60.1		15.1		35.1	35.4			
Max Q Clear Time (g_c+I1), s	6.5		2.1	17.0		2.3		12.1	20.4			
Green Ext Time (p_c), s	0.9		0.0	3.6		0.0		0.4	3.9			
Intersection Summary												
HCM 6th Ctrl Delay				33.1								
HCM 6th LOS				C								
Notes												
User approved pedestrian interval to be less than phase max green.												
User approved volume balancing among the lanes for turning movement.												






















HCM 6th TWSC
2: Iroquois St/Apple Valley Ln & W Steele Ln

Lance Drive Residential TIA
Existing Plus Project AM (120 Seconds)

Intersection												
Int Delay, s/veh	4.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	26	349	48	16	295	16	52	5	34	14	5	38
Future Vol, veh/h	26	349	48	16	295	16	52	5	34	14	5	38
Conflicting Peds, #/hr	12	0	24	24	0	12	4	0	4	4	0	4
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	60	-	-	80	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	31	420	58	19	355	19	63	6	41	17	6	46
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	386	0	0	502	0	0	968	959	477	954	979	381
Stage 1	-	-	-	-	-	-	535	535	-	415	415	-
Stage 2	-	-	-	-	-	-	433	424	-	539	564	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1167	-	-	1057	-	-	232	256	586	237	249	664
Stage 1	-	-	-	-	-	-	527	522	-	613	591	-
Stage 2	-	-	-	-	-	-	599	585	-	525	507	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1154	-	-	1033	-	-	199	236	570	205	230	654
Mov Cap-2 Maneuver	-	-	-	-	-	-	199	236	-	205	230	-
Stage 1	-	-	-	-	-	-	501	496	-	590	574	-
Stage 2	-	-	-	-	-	-	539	568	-	467	482	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.5			0.4			27.7			16.4		
HCM LOS							D			C		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	266	1154	-	-	1033	-	-	385				
HCM Lane V/C Ratio	0.412	0.027	-	-	0.019	-	-	0.178				
HCM Control Delay (s)	27.7	8.2	-	-	8.6	-	-	16.4				
HCM Lane LOS	D	A	-	-	A	-	-	C				
HCM 95th %tile Q(veh)	1.9	0.1	-	-	0.1	-	-	0.6				

HCM 6th Signalized Intersection Summary 3: Range Ave & W Steele Ln

Lance Drive Residential TIA
Existing Plus Project AM (120 Seconds)












												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	406	45	44	265	38	37	170	25	26	142	29
Future Volume (veh/h)	40	406	45	44	265	38	37	170	25	26	142	29
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.95	1.00		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	45	461	46	50	301	38	42	193	16	30	161	11
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	786	1260	126	650	1224	155	55	391	32	47	406	27
Arrive On Green	0.76	0.76	0.76	0.76	0.76	0.76	0.03	0.12	0.12	0.03	0.12	0.12
Sat Flow, veh/h	1031	1659	166	884	1612	203	1767	3284	269	1767	3336	225
Grp Volume(v), veh/h	45	0	507	50	0	339	42	103	106	30	84	88
Grp Sat Flow(s),veh/h/ln	1031	0	1825	884	0	1815	1767	1763	1790	1767	1763	1799
Q Serve(g_s), s	1.6	0.0	11.1	2.4	0.0	6.6	2.8	6.5	6.7	2.0	5.3	5.4
Cycle Q Clear(g_c), s	8.2	0.0	11.1	13.5	0.0	6.6	2.8	6.5	6.7	2.0	5.3	5.4
Prop In Lane	1.00		0.09	1.00		0.11	1.00		0.15	1.00		0.13
Lane Grp Cap(c), veh/h	786	0	1386	650	0	1378	55	210	213	47	214	219
V/C Ratio(X)	0.06	0.00	0.37	0.08	0.00	0.25	0.76	0.49	0.50	0.64	0.39	0.40
Avail Cap(c_a), veh/h	786	0	1386	650	0	1378	162	413	419	147	398	406
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.85	0.85	0.85	1.00	1.00	1.00
Uniform Delay (d), s/veh	5.5	0.0	4.8	7.1	0.0	4.3	57.7	49.4	49.5	57.9	48.6	48.7
Incr Delay (d2), s/veh	0.1	0.0	0.7	0.2	0.0	0.4	6.5	0.6	0.6	5.4	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	3.7	0.5	0.0	2.2	1.3	2.9	3.0	1.0	2.3	2.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	5.6	0.0	5.6	7.3	0.0	4.7	64.2	50.0	50.1	63.3	49.0	49.1
LnGrp LOS	A	A	A	A	A	A	E	D	D	E	D	D
Approach Vol, veh/h		552			389			251			202	
Approach Delay, s/veh		5.6			5.0			52.4			51.2	
Approach LOS		A			A			D			D	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		94.7	6.8	18.5		94.7	7.1	18.2				
Change Period (Y+Rc), s		3.6	3.0	3.9		3.6	3.9	* 3.9				
Max Green Setting (Gmax), s		71.4	11.0	27.1		71.4	10.0	* 28				
Max Q Clear Time (g_c+I1), s		13.1	4.8	7.4		15.5	4.0	8.7				
Green Ext Time (p_c), s		1.1	0.0	0.3		0.8	0.0	0.3				
Intersection Summary												
HCM 6th Ctrl Delay			20.5									
HCM 6th LOS			C									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

HCM 6th Signalized Intersection Summary

4: Marlow Rd & Guerneville Rd

Lance Drive Residential TIA
Existing Plus Project AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	109	445	141	166	284	90	124	463	172	111	484	80
Future Volume (veh/h)	109	445	141	166	284	90	124	463	172	111	484	80
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	118	484	108	180	309	68	135	503	73	121	526	74
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	145	627	422	209	626	136	163	636	463	218	654	92
Arrive On Green	0.08	0.18	0.18	0.12	0.22	0.22	0.09	0.18	0.18	0.04	0.07	0.07
Sat Flow, veh/h	1767	3526	1557	1767	2876	624	1767	3526	1539	1767	3095	434
Grp Volume(v), veh/h	118	484	108	180	188	189	135	503	73	121	299	301
Grp Sat Flow(s),veh/h/ln	1767	1763	1557	1767	1763	1737	1767	1763	1539	1767	1763	1766
Q Serve(g_s), s	7.9	15.7	2.3	12.0	11.2	11.5	9.0	16.4	0.0	8.1	20.0	20.2
Cycle Q Clear(g_c), s	7.9	15.7	2.3	12.0	11.2	11.5	9.0	16.4	0.0	8.1	20.0	20.2
Prop In Lane	1.00		1.00	1.00		0.36	1.00		1.00	1.00		0.25
Lane Grp Cap(c), veh/h	145	627	422	209	384	378	163	636	463	218	372	373
V/C Ratio(X)	0.82	0.77	0.26	0.86	0.49	0.50	0.83	0.79	0.16	0.56	0.80	0.81
Avail Cap(c_a), veh/h	246	861	525	290	474	468	275	961	605	246	451	452
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	0.99	0.99	0.99	0.59	0.59	0.59	0.93	0.93	0.93
Uniform Delay (d), s/veh	54.2	47.0	6.0	51.9	41.1	41.2	53.5	47.0	31.0	54.3	53.3	53.4
Incr Delay (d2), s/veh	10.6	3.0	0.3	16.9	4.4	4.6	6.3	1.6	0.1	2.1	7.9	8.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	7.0	1.7	6.2	5.2	5.3	4.2	7.2	1.5	3.9	10.3	10.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	64.8	50.0	6.3	68.9	45.5	45.9	59.8	48.6	31.1	56.4	61.2	61.6
LnGrp LOS	E	D	A	E	D	D	E	D	C	E	E	E
Approach Vol, veh/h	710			557			711			721		
Approach Delay, s/veh	45.8			53.2			48.9			60.6		
Approach LOS	D			D			D			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.9	27.1	16.4	30.6	15.1	31.8	20.1	26.9				
Change Period (Y+Rc), s	5.7	* 5.7	5.3	5.3	5.3	5.7	5.3	5.3				
Max Green Setting (Gmax), s	29.3	* 29	18.7	30.7	16.7	32.3	16.7	32.7				
Max Q Clear Time (g_c+14.0), s	17.7	17.7	11.0	22.2	9.9	13.5	10.1	18.4				
Green Ext Time (p_c), s	0.2	2.6	0.2	2.3	0.1	1.9	0.1	2.9				

Intersection Summary

HCM 6th Ctrl Delay 52.1

HCM 6th LOS D

Notes







User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary 5: Ridley Ave & Guerneville Rd

Lance Drive Residential TIA
Existing Plus Project AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	692	25	62	480	11	36	4	58	15	4	15
Future Volume (veh/h)	20	692	25	62	480	11	36	4	58	15	4	15
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	0.98		0.96	0.98		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	22	778	21	70	539	8	40	4	8	17	4	2
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	728	3003	81	610	3047	45	143	17	19	143	31	12
Arrive On Green	0.86	0.86	0.86	0.57	0.57	0.57	0.09	0.09	0.09	0.09	0.09	0.09
Sat Flow, veh/h	852	3504	95	674	3556	53	1047	193	226	1065	365	136
Grp Volume(v), veh/h	22	391	408	70	267	280	52	0	0	23	0	0
Grp Sat Flow(s),veh/h/ln	852	1763	1836	674	1763	1846	1466	0	0	1567	0	0
Q Serve(g_s), s	0.7	4.9	4.9	6.1	8.6	8.6	2.4	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	9.3	4.9	4.9	11.0	8.6	8.6	3.8	0.0	0.0	1.4	0.0	0.0
Prop In Lane	1.00		0.05	1.00		0.03	0.77		0.15	0.74		0.09
Lane Grp Cap(c), veh/h	728	1511	1573	610	1511	1582	179	0	0	186	0	0
V/C Ratio(X)	0.03	0.26	0.26	0.11	0.18	0.18	0.29	0.00	0.00	0.12	0.00	0.00
Avail Cap(c_a), veh/h	728	1511	1573	610	1511	1582	518	0	0	532	0	0
HCM Platoon Ratio	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.93	0.93	0.93	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	2.8	1.6	1.6	7.2	5.5	5.5	51.8	0.0	0.0	50.8	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.4	0.4	0.0	0.0	0.0	0.3	0.0	0.0	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.9	0.9	0.8	2.1	2.2	1.5	0.0	0.0	0.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	2.9	2.0	2.0	7.2	5.5	5.5	52.1	0.0	0.0	50.9	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	D	A	A	D	A	A
Approach Vol, veh/h	821		617			52			23			
Approach Delay, s/veh	2.0		5.7			52.1			50.9			
Approach LOS	A		A			D			D			
Timer - Assigned Phs	2		4			6			8			
Phs Duration (G+Y+Rc), s	106.7		13.3			106.7			13.3			
Change Period (Y+Rc), s	3.9		3.0			3.9			3.0			
Max Green Setting (Gmax), s	74.1		39.0			74.1			39.0			
Max Q Clear Time (g_c+I1), s	11.3		3.4			13.0			5.8			
Green Ext Time (p_c), s	1.5		0.0			1.2			0.1			
Intersection Summary												
HCM 6th Ctrl Delay	6.0											
HCM 6th LOS	A											

HCM 6th Signalized Intersection Summary 6: Lance Dr & Guerneville Rd

Lance Drive Residential TIA
Existing Plus Project AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	39	718	24	22	432	81	12	47	60	163	89	107
Future Volume (veh/h)	39	718	24	22	432	81	12	47	60	163	89	107
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.99	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	46	855	27	26	514	70	14	56	47	194	106	117
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	69	927	29	60	919	400	70	261	200	246	113	123
Arrive On Green	0.01	0.09	0.09	0.01	0.09	0.09	0.30	0.30	0.30	0.30	0.30	0.30
Sat Flow, veh/h	1767	3485	110	1767	3526	1536	124	876	672	678	378	412
Grp Volume(v), veh/h	46	432	450	26	514	70	117	0	0	417	0	0
Grp Sat Flow(s), veh/h/ln	1767	1763	1833	1767	1763	1536	1672	0	0	1469	0	0
Q Serve(g_s), s	3.1	29.2	29.2	1.8	16.8	5.1	0.0	0.0	0.0	27.3	0.0	0.0
Cycle Q Clear(g_c), s	3.1	29.2	29.2	1.8	16.8	5.1	6.1	0.0	0.0	33.4	0.0	0.0
Prop In Lane	1.00		0.06	1.00		1.00	0.12		0.40	0.47		0.28
Lane Grp Cap(c), veh/h	69	469	488	60	919	400	531	0	0	481	0	0
V/C Ratio(X)	0.66	0.92	0.92	0.44	0.56	0.17	0.22	0.00	0.00	0.87	0.00	0.00
Avail Cap(c_a), veh/h	143	804	835	158	1636	713	581	0	0	526	0	0
HCM Platoon Ratio	0.33	0.33	0.33	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.98	0.98	0.98	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	58.4	53.5	53.5	58.2	48.2	42.9	31.7	0.0	0.0	41.3	0.0	0.0
Incr Delay (d2), s/veh	4.0	5.8	5.7	1.8	2.4	0.9	0.1	0.0	0.0	12.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	14.5	15.1	0.8	8.2	2.1	2.6	0.0	0.0	13.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	62.4	59.3	59.2	60.0	50.6	43.8	31.8	0.0	0.0	53.8	0.0	0.0
LnGrp LOS	E	E	E	E	D	D	C	A	A	D	A	A
Approach Vol, veh/h	928			610			117			417		
Approach Delay, s/veh	59.4			50.2			31.8			53.8		
Approach LOS	E			D			C			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.4	37.2		40.3	10.0	36.6		40.3				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		4.6				
Max Green Setting (Gmax), s	10.7	54.7		39.4	9.7	55.7		39.4				
Max Q Clear Time (g_c+11.8), s	13.8	31.2		35.4	5.1	18.8		8.1				
Green Ext Time (p_c), s	0.0	0.7		0.3	0.0	0.6		0.1				

Intersection Summary

HCM 6th Ctrl Delay 54.0
HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

7: N Dutton Ave/Westberry Dr & Guerneville Rd

Lance Drive Residential TIA
Existing Plus Project AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	900	135	234	474	7	92	2	363	20	3	6
Future Volume (veh/h)	3	900	135	234	474	7	92	2	363	20	3	6
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	4	1084	158	282	571	7	112	0	106	24	4	0
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	11	1127	164	1292	2626	32	169	0	668	59	10	0
Arrive On Green	0.01	0.37	0.37	0.75	1.00	1.00	0.05	0.00	0.05	0.04	0.04	0.00
Sat Flow, veh/h	1767	3080	448	3428	3565	44	3534	0	1563	1525	254	0
Grp Volume(v), veh/h	4	619	623	282	282	296	112	0	106	28	0	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1765	1714	1763	1846	1767	0	1563	1779	0	0
Q Serve(g_s), s	0.3	41.2	41.5	2.9	0.0	0.0	3.7	0.0	0.0	1.8	0.0	0.0
Cycle Q Clear(g_c), s	0.3	41.2	41.5	2.9	0.0	0.0	3.7	0.0	0.0	1.8	0.0	0.0
Prop In Lane	1.00		0.25	1.00		0.02	1.00		1.00	0.86		0.00
Lane Grp Cap(c), veh/h	11	645	646	1292	1299	1360	169	0	668	68	0	0
V/C Ratio(X)	0.36	0.96	0.96	0.22	0.22	0.22	0.66	0.00	0.16	0.41	0.00	0.00
Avail Cap(c_a), veh/h	90	667	668	1292	1299	1360	265	0	710	377	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.88	0.88	0.88	0.94	0.94	0.94	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	59.4	37.2	37.3	9.6	0.0	0.0	56.2	0.0	21.3	56.4	0.0	0.0
Incr Delay (d2), s/veh	6.4	24.8	25.5	0.0	0.4	0.3	1.6	0.0	0.0	1.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	21.4	21.7	1.0	0.1	0.1	1.7	0.0	1.8	0.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	65.8	62.0	62.7	9.6	0.4	0.3	57.8	0.0	21.3	57.8	0.0	0.0
LnGrp LOS	E	E	E	A	A	A	E	A	C	E	A	A
Approach Vol, veh/h	1246			860			218			28		
Approach Delay, s/veh	62.4			3.4			40.1			57.8		
Approach LOS	E			A			D			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	50.5	49.2		9.2	6.0	93.7		11.0				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		5.3				
Max Green Setting (Gmax), s	45.3	45.4		25.4	6.1	59.0		9.0				
Max Q Clear Time (g_c+14.5), s	43.5	43.5		3.8	2.3	2.0		5.7				
Green Ext Time (p_c), s	0.0	0.5		0.0	0.0	0.4		0.0				

Intersection Summary

HCM 6th Ctrl Delay 38.7

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

8: Herbert St/Coffey Ln & Guerneville Rd

Lance Drive Residential TIA
Existing Plus Project AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	123	1129	29	17	548	36	20	12	15	75	5	148
Future Volume (veh/h)	123	1129	29	17	548	36	20	12	15	75	5	148
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		0.96	1.00		0.93	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	143	1313	33	20	637	39	23	14	1	87	6	39
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	167	1278	32	573	2000	122	63	38	3	143	10	278
Arrive On Green	0.19	0.73	0.73	0.65	1.00	1.00	0.06	0.06	0.06	0.09	0.09	0.09
Sat Flow, veh/h	1767	3509	88	1767	3364	206	1083	659	47	1658	114	1507
Grp Volume(v), veh/h	143	659	687	20	333	343	38	0	0	93	0	39
Grp Sat Flow(s), veh/h/ln	1767	1763	1834	1767	1763	1807	1789	0	0	1773	0	1507
Q Serve(g_s), s	9.4	43.7	43.7	0.5	0.0	0.0	2.5	0.0	0.0	6.1	0.0	2.6
Cycle Q Clear(g_c), s	9.4	43.7	43.7	0.5	0.0	0.0	2.5	0.0	0.0	6.1	0.0	2.6
Prop In Lane	1.00		0.05	1.00		0.11	0.61		0.03	0.94		1.00
Lane Grp Cap(c), veh/h	167	642	668	573	1048	1074	103	0	0	153	0	278
V/C Ratio(X)	0.86	1.03	1.03	0.03	0.32	0.32	0.37	0.00	0.00	0.61	0.00	0.14
Avail Cap(c_a), veh/h	225	642	668	573	1048	1074	373	0	0	386	0	476
HCM Platoon Ratio	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.74	0.74	0.74	0.94	0.94	0.94	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	47.9	16.3	16.3	14.3	0.0	0.0	54.4	0.0	0.0	52.9	0.0	41.4
Incr Delay (d2), s/veh	13.1	37.5	37.4	0.0	0.8	0.7	0.8	0.0	0.0	1.5	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.3	12.5	13.0	0.2	0.2	0.2	1.1	0.0	0.0	2.7	0.0	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.0	53.8	53.7	14.3	0.8	0.7	55.2	0.0	0.0	54.4	0.0	41.5
LnGrp LOS	E	F	F	B	A	A	E	A	A	D	A	D
Approach Vol, veh/h	1489			696			38			132		
Approach Delay, s/veh	54.5			1.1			55.2			50.5		
Approach LOS	D			A			E			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	44.2	49.0		15.2	16.6	76.6		11.5				
Change Period (Y+Rc), s	5.3	5.3		4.9	5.3	5.3		4.6				
Max Green Setting (Gmax), s	5.3	43.7		26.1	15.3	33.5		25.0				
Max Q Clear Time (g_c+12.5), s	12.5	45.7		8.1	11.4	2.0		4.5				
Green Ext Time (p_c), s	0.0	0.0		0.1	0.0	0.5		0.0				
Intersection Summary												
HCM 6th Ctrl Delay				38.5								
HCM 6th LOS				D								

HCM 6th Signalized Intersection Summary

9: Range Ave & Guerneville Rd

Lance Drive Residential TIA
Existing Plus Project AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	141	761	145	69	422	5	129	86	72	28	98	102
Future Volume (veh/h)	141	761	145	69	422	5	129	86	72	28	98	102
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.96	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	150	810	0	73	449	0	79	173	8	30	104	9
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	237	857		93	570		129	256	12	102	189	16
Arrive On Green	0.27	0.49	0.00	0.05	0.16	0.00	0.07	0.07	0.07	0.02	0.02	0.02
Sat Flow, veh/h	1767	3618	0	1767	3618	0	1767	3512	161	1767	3272	279
Grp Volume(v), veh/h	150	810	0	73	449	0	79	91	90	30	55	58
Grp Sat Flow(s),veh/h/ln	1767	1763	0	1767	1763	0	1767	1856	1818	1767	1763	1788
Q Serve(g_s), s	9.0	26.2	0.0	4.9	14.7	0.0	5.2	5.7	5.8	2.0	3.7	3.8
Cycle Q Clear(g_c), s	9.0	26.2	0.0	4.9	14.7	0.0	5.2	5.7	5.8	2.0	3.7	3.8
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.09	1.00		0.16
Lane Grp Cap(c), veh/h	237	857		93	570		129	135	133	102	102	103
V/C Ratio(X)	0.63	0.94		0.79	0.79		0.61	0.67	0.68	0.29	0.54	0.56
Avail Cap(c_a), veh/h	437	1548		246	1166		227	238	233	216	216	219
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	0.80	0.80	0.00	0.98	0.98	0.00	1.00	1.00	1.00	0.83	0.83	0.83
Uniform Delay (d), s/veh	41.3	30.1	0.0	56.2	48.3	0.0	54.0	54.2	54.3	56.4	57.3	57.3
Incr Delay (d2), s/veh	0.8	3.1	0.0	5.3	10.3	0.0	1.8	2.1	2.3	0.5	1.4	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	8.2	0.0	2.3	7.2	0.0	2.4	2.8	2.7	0.9	1.7	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.2	33.2	0.0	61.5	58.6	0.0	55.7	56.4	56.5	56.9	58.7	58.8
LnGrp LOS	D	C		E	E		E	E	E	E	E	E
Approach Vol, veh/h	960		A	522		A	260		143			
Approach Delay, s/veh	34.6			59.0			56.2		58.3			
Approach LOS	C			E			E		E			
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	1.6	34.5		12.2	21.4	24.7		13.4				
Change Period (Y+Rc), s	5.3	5.3		5.3	5.3	5.3		4.6				
Max Green Setting (Gmax), s	6.3	52.7		14.7	29.7	39.7		15.4				
Max Q Clear Time (g_c+10), s	10.9	28.2		5.8	11.0	16.7		7.8				
Green Ext Time (p_c), s	0.0	1.0		0.0	0.0	0.6		0.1				

Intersection Summary

HCM 6th Ctrl Delay 46.2

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

10: Guerneville Rd & Steele Wy

Lance Drive Residential TIA
Existing Plus Project AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	794	42	51	463	5	24	10	53	382	16	9
Future Volume (veh/h)	25	794	42	51	463	5	24	10	53	382	16	9
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	28	902	28	58	526	5	19	22	5	447	0	4
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	840	2063	1000	200	601	6	91	96	172	509	0	973
Arrive On Green	0.48	0.59	0.59	0.06	0.17	0.17	0.05	0.05	0.05	0.14	0.00	0.14
Sat Flow, veh/h	1767	3526	1571	3428	3577	34	1767	1856	1556	3534	0	1566
Grp Volume(v), veh/h	28	902	28	58	259	272	19	22	5	447	0	4
Grp Sat Flow(s), veh/h/ln	1767	1763	1571	1714	1763	1848	1767	1856	1556	1767	0	1566
Q Serve(g_s), s	1.0	17.1	0.8	1.9	17.2	17.2	1.2	1.4	0.3	14.9	0.0	0.0
Cycle Q Clear(g_c), s	1.0	17.1	0.8	1.9	17.2	17.2	1.2	1.4	0.3	14.9	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.02	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	840	2063	1000	200	296	310	91	96	172	509	0	973
V/C Ratio(X)	0.03	0.44	0.03	0.29	0.87	0.88	0.21	0.23	0.03	0.88	0.00	0.00
Avail Cap(c_a), veh/h	840	2063	1000	203	580	608	398	417	442	798	0	1101
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.90	0.90	0.90	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	16.8	13.9	8.1	54.1	48.7	48.7	54.5	54.6	47.7	50.3	0.0	8.7
Incr Delay (d2), s/veh	0.0	0.6	0.0	0.3	3.2	3.1	0.4	0.4	0.0	4.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	6.7	0.3	0.8	7.7	8.1	0.6	0.7	0.1	6.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.8	14.5	8.1	54.4	51.9	51.8	55.0	55.0	47.7	54.8	0.0	8.7
LnGrp LOS	B	B	A	D	D	D	D	E	D	D	A	A
Approach Vol, veh/h	958			589			46			451		
Approach Delay, s/veh	14.4			52.1			54.2			54.4		
Approach LOS	B			D			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	1.9	75.1		22.2	62.0	25.1		10.8				
Change Period (Y+Rc), s	4.9	4.9		4.9	4.9	4.9		4.6				
Max Green Setting (Gmax), s	39.5			27.1	7.1	39.5		27.0				
Max Q Clear Time (g_c+13), s	19.1			16.9	3.0	19.2		3.4				
Green Ext Time (p_c), s	0.0	1.2		0.1	0.0	0.5		0.0				

Intersection Summary

HCM 6th Ctrl Delay 35.0

HCM 6th LOS C

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

11: Cleveland Ave & Guerneville Rd

Lance Drive Residential TIA
Existing Plus Project AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰ ↱	↑ ↑		↰ ↱	↑ ↑	↱	↰	↑ ↑		↰ ↱	↰ ↱	
Traffic Volume (veh/h)	52	1179	32	172	826	184	28	87	141	223	63	34
Future Volume (veh/h)	52	1179	32	172	826	184	28	87	141	223	63	34
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	57	1296	32	189	908	118	31	96	48	245	69	25
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	242	1407	35	243	977	426	690	905	423	347	127	46
Arrive On Green	0.07	0.28	0.28	0.07	0.28	0.28	0.39	0.39	0.39	0.10	0.10	0.10
Sat Flow, veh/h	3428	5081	125	3428	3526	1536	1767	2317	1084	3534	1293	468
Grp Volume(v), veh/h	57	861	467	189	908	118	31	71	73	245	0	94
Grp Sat Flow(s), veh/h/ln	1714	1689	1830	1714	1763	1536	1767	1763	1638	1767	0	1761
Q Serve(g_s), s	1.9	29.7	29.7	6.5	30.1	7.2	1.3	3.1	3.4	8.1	0.0	6.1
Cycle Q Clear(g_c), s	1.9	29.7	29.7	6.5	30.1	7.2	1.3	3.1	3.4	8.1	0.0	6.1
Prop In Lane	1.00		0.07	1.00		1.00	1.00		0.66	1.00		0.27
Lane Grp Cap(c), veh/h	242	935	507	243	977	426	690	689	640	347	0	173
V/C Ratio(X)	0.24	0.92	0.92	0.78	0.93	0.28	0.04	0.10	0.11	0.71	0.00	0.54
Avail Cap(c_a), veh/h	242	1185	642	374	1413	616	690	689	640	857	0	427
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.76	0.76	0.76	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	52.7	42.1	42.1	54.8	42.2	34.0	22.7	23.2	23.3	52.4	0.0	51.5
Incr Delay (d2), s/veh	0.2	8.9	14.7	1.7	5.4	0.1	0.1	0.3	0.4	1.0	0.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	13.3	15.2	2.8	13.6	2.7	0.6	1.4	1.4	3.6	0.0	2.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.9	51.1	56.8	56.5	47.6	34.1	22.8	23.5	23.7	53.4	0.0	52.5
LnGrp LOS	D	D	E	E	D	C	C	C	C	D	A	D
Approach Vol, veh/h	1385			1215			175			339		
Approach Delay, s/veh	53.1			47.7			23.5			53.2		
Approach LOS	D			D			C			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	3.4	38.1		51.8	13.4	38.2		16.7				
Change Period (Y+Rc), s	4.9	4.9		4.9	4.9	4.9		4.9				
Max Green Setting (Gmax), s	3.4	42.1		16.1	7.1	48.1		29.1				
Max Q Clear Time (g_c+1.5), s	3.4	31.7		5.4	3.9	32.1		10.1				
Green Ext Time (p_c), s	0.0	1.5		0.1	0.0	1.2		0.1				

Intersection Summary

HCM 6th Ctrl Delay 49.3

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

12: US 101 SB Ramps & Guerneville Rd

Lance Drive Residential TIA
Existing Plus Project AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑					↑	↑	↑
Traffic Volume (veh/h)	0	1043	506	254	902	0	0	0	0	344	2	281
Future Volume (veh/h)	0	1043	506	254	902	0	0	0	0	344	2	281
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1856	1856	1856	1856	0				1856	1856	1856
Adj Flow Rate, veh/h	0	1172	231	285	1013	0				388	0	278
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89				0.89	0.89	0.89
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	1291	394	338	1391	0				1860	0	828
Arrive On Green	0.00	0.25	0.25	0.10	0.39	0.00				0.53	0.00	0.53
Sat Flow, veh/h	0	5233	1544	3428	3618	0				3534	0	1572
Grp Volume(v), veh/h	0	1172	231	285	1013	0				388	0	278
Grp Sat Flow(s),veh/h/ln	0	1689	1544	1714	1763	0				1767	0	1572
Q Serve(g_s), s	0.0	26.9	15.7	9.8	29.3	0.0				7.0	0.0	12.2
Cycle Q Clear(g_c), s	0.0	26.9	15.7	9.8	29.3	0.0				7.0	0.0	12.2
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1291	394	338	1391	0				1860	0	828
V/C Ratio(X)	0.00	0.91	0.59	0.84	0.73	0.00				0.21	0.00	0.34
Avail Cap(c_a), veh/h	0	2030	619	546	2118	0				1860	0	828
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.36	0.36	0.83	0.83	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	43.3	39.2	53.2	30.9	0.0				15.1	0.0	16.3
Incr Delay (d2), s/veh	0.0	1.1	0.2	2.8	0.2	0.0				0.3	0.0	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	11.2	5.9	4.3	12.2	0.0				2.7	0.0	4.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	44.4	39.4	55.9	31.1	0.0				15.4	0.0	17.4
LnGrp LOS	A	D	D	E	C	A				B	A	B
Approach Vol, veh/h		1403			1298						666	
Approach Delay, s/veh		43.6			36.6						16.2	
Approach LOS		D			D						B	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	6.7	35.5		67.8		52.2						
Change Period (Y+Rc), s	4.9	4.9		4.6		4.9						
Max Green Setting (Gmax), s	48.1			38.4		72.1						
Max Q Clear Time (g_c+I1), s	28.9			14.2		31.3						
Green Ext Time (p_c), s	0.0	1.7		0.1		1.4						

Intersection Summary

HCM 6th Ctrl Delay 35.5
HCM 6th LOS D

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 13: US 101 NB Ramps & Guerneville Rd/Steele Ln

Lance Drive Residential TIA
Existing Plus Project AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↑↑			↑↑↑		↰	↰↱	↰			
Traffic Volume (veh/h)	400	987	0	0	791	203	365	1	411	0	0	0
Future Volume (veh/h)	400	987	0	0	791	203	365	1	411	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1856	1856	0	0	1856	1856	1856	1856	1856			
Adj Flow Rate, veh/h	449	1109	0	0	889	200	503	0	200			
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89			
Percent Heavy Veh, %	3	3	0	0	3	3	3	3	3			
Cap, veh/h	1659	2692	0	0	984	220	555	0	247			
Arrive On Green	0.97	1.00	0.00	0.00	0.24	0.24	0.16	0.00	0.16			
Sat Flow, veh/h	3428	3618	0	0	4284	921	3534	0	1572			
Grp Volume(v), veh/h	449	1109	0	0	728	361	503	0	200			
Grp Sat Flow(s),veh/h/ln	1714	1763	0	0	1689	1661	1767	0	1572			
Q Serve(g_s), s	0.7	0.0	0.0	0.0	25.1	25.3	16.8	0.0	14.7			
Cycle Q Clear(g_c), s	0.7	0.0	0.0	0.0	25.1	25.3	16.8	0.0	14.7			
Prop In Lane	1.00		0.00	0.00		0.55	1.00		1.00			
Lane Grp Cap(c), veh/h	1659	2692	0	0	807	397	555	0	247			
V/C Ratio(X)	0.27	0.41	0.00	0.00	0.90	0.91	0.91	0.00	0.81			
Avail Cap(c_a), veh/h	1659	2692	0	0	1185	583	1160	0	516			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.57	0.57	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	1.0	0.0	0.0	0.0	44.3	44.4	49.7	0.0	48.8			
Incr Delay (d2), s/veh	0.0	0.3	0.0	0.0	5.3	10.7	2.4	0.0	2.4			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.2	0.1	0.0	0.0	10.9	11.4	7.4	0.0	5.8			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	1.0	0.3	0.0	0.0	49.6	55.0	52.0	0.0	51.2			
LnGrp LOS	A	A	A	A	D	E	D	A	D			
Approach Vol, veh/h	1558			1089			703					
Approach Delay, s/veh	0.5			51.4			51.8					
Approach LOS	A			D			D					
Timer - Assigned Phs	2			5			6			8		
Phs Duration (G+Y+Rc), s	96.5			63.0			33.6			23.5		
Change Period (Y+Rc), s	4.9			4.9			4.9			4.6		
Max Green Setting (Gmax), s	71.1			24.1			42.1			39.4		
Max Q Clear Time (g_c+I1), s	2.0			2.7			27.3			18.8		
Green Ext Time (p_c), s	1.6			0.1			1.4			0.1		

Intersection Summary

HCM 6th Ctrl Delay	27.8
HCM 6th LOS	C

Notes










User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

14: Stony Point Rd/Marlow Rd & W College Ave

Lance Drive Residential TIA
Existing Plus Project AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	75	338	135	154	183	117	73	574	159	164	562	65
Future Volume (veh/h)	75	338	135	154	183	117	73	574	159	164	562	65
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	83	376	114	171	203	44	81	638	91	182	624	65
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	491	465	139	560	619	131	103	747	824	211	879	91
Arrive On Green	0.28	0.17	0.17	0.32	0.21	0.21	0.06	0.21	0.21	0.12	0.27	0.27
Sat Flow, veh/h	1767	2661	795	1767	2890	613	1767	3526	1537	1767	3215	334
Grp Volume(v), veh/h	83	247	243	171	122	125	81	638	91	182	342	347
Grp Sat Flow(s),veh/h/ln	1767	1763	1693	1767	1763	1741	1767	1763	1537	1767	1763	1787
Q Serve(g_s), s	4.3	16.2	16.6	8.8	7.0	7.3	5.4	20.9	1.7	12.1	21.0	21.0
Cycle Q Clear(g_c), s	4.3	16.2	16.6	8.8	7.0	7.3	5.4	20.9	1.7	12.1	21.0	21.0
Prop In Lane	1.00		0.47	1.00		0.35	1.00		1.00	1.00		0.19
Lane Grp Cap(c), veh/h	491	308	296	560	377	373	103	747	824	211	482	489
V/C Ratio(X)	0.17	0.80	0.82	0.31	0.32	0.34	0.79	0.85	0.11	0.86	0.71	0.71
Avail Cap(c_a), veh/h	491	383	368	560	504	498	180	887	885	314	577	585
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.48	0.48	0.48	1.00	1.00	1.00	0.66	0.66	0.66
Uniform Delay (d), s/veh	32.9	47.5	47.7	31.0	39.8	39.9	55.8	45.5	4.8	51.8	39.3	39.3
Incr Delay (d2), s/veh	0.2	9.5	11.4	0.1	0.2	0.3	12.4	7.1	0.1	10.2	2.1	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	7.8	7.8	3.7	3.0	3.1	2.7	9.7	0.7	5.9	9.1	9.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.0	57.1	59.1	31.1	40.1	40.2	68.2	52.6	4.8	62.1	41.4	41.5
LnGrp LOS	C	E	E	C	D	D	E	D	A	E	D	D
Approach Vol, veh/h	573				418		810				871	
Approach Delay, s/veh	54.4				36.4		48.8				45.7	
Approach LOS	D				D		D				D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	43.3	26.3	12.3	38.1	38.6	31.0	19.7	30.7				
Change Period (Y+Rc), s	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3				
Max Green Setting (Gmax), s	41.8	26.1	12.2	39.3	13.0	34.3	21.3	30.2				
Max Q Clear Time (g_c+110, s)	18.6	7.4	23.0	6.3	9.3	14.1	22.9					
Green Ext Time (p_c), s	0.3	1.7	0.1	3.6	0.1	1.3	0.3	2.5				

Intersection Summary

HCM 6th Ctrl Delay 47.1

HCM 6th LOS D

Notes









User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

15: N Dutton Ave & W College Ave

Lance Drive Residential TIA
Existing Plus Project AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	84	673	89	81	502	277	75	354	93	204	228	49
Future Volume (veh/h)	84	673	89	81	502	277	75	354	93	204	228	49
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No				No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	90	724	86	87	540	217	81	381	80	219	245	36
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	113	796	94	109	630	252	630	454	94	720	641	93
Arrive On Green	0.06	0.25	0.25	0.06	0.26	0.26	0.36	0.16	0.16	0.41	0.21	0.21
Sat Flow, veh/h	1767	3166	376	1767	2453	982	1767	2893	601	1767	3081	446
Grp Volume(v), veh/h	90	403	407	87	388	369	81	230	231	219	139	142
Grp Sat Flow(s),veh/h/ln	1767	1763	1779	1767	1763	1672	1767	1763	1731	1767	1763	1764
Q Serve(g_s), s	6.0	26.6	26.7	5.8	25.1	25.3	3.7	15.2	15.5	10.1	8.1	8.3
Cycle Q Clear(g_c), s	6.0	26.6	26.7	5.8	25.1	25.3	3.7	15.2	15.5	10.1	8.1	8.3
Prop In Lane	1.00		0.21	1.00		0.59	1.00		0.35	1.00		0.25
Lane Grp Cap(c), veh/h	113	443	447	109	453	430	630	276	271	720	366	367
V/C Ratio(X)	0.80	0.91	0.91	0.80	0.86	0.86	0.13	0.83	0.85	0.30	0.38	0.39
Avail Cap(c_a), veh/h	177	604	609	177	604	573	630	383	376	720	574	575
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.69	0.69	0.69	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	55.4	43.6	43.6	55.6	42.5	42.5	26.0	49.1	49.2	24.0	40.9	40.9
Incr Delay (d2), s/veh	4.1	8.9	9.0	4.9	7.2	7.9	0.0	7.8	9.4	0.1	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	12.5	12.6	2.7	11.7	11.2	1.6	7.2	7.4	4.1	3.5	3.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.5	52.5	52.6	60.5	49.7	50.4	26.1	56.9	58.6	24.1	41.1	41.2
LnGrp LOS	E	D	D	E	D	D	C	E	E	C	D	D
Approach Vol, veh/h	900		844			542			500			
Approach Delay, s/veh	53.3		51.1			53.0			33.7			
Approach LOS	D		D			D			C			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	1.3	34.1	45.8	28.8	10.6	34.7	51.9	22.7				
Change Period (Y+Rc), s	3.9	* 3.9	3.0	3.9	3.0	3.9	3.0	3.9				
Max Green Setting (Gmax), s	2.0	* 41	14.0	39.1	12.0	41.1	27.0	26.1				
Max Q Clear Time (g_c+11), s	28.7	5.7	10.3	8.0	27.3	12.1	17.5					
Green Ext Time (p_c), s	0.0	1.5	0.0	0.5	0.0	1.5	0.1	0.7				

Intersection Summary

HCM 6th Ctrl Delay 49.1

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection

Intersection Delay, s/veh 8.4

Intersection LOS A




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	8	63	0	20	23	57	0	8	55	93	2	3
Future Vol, veh/h	8	63	0	20	23	57	0	8	55	93	2	3
Peak Hour Factor	0.66	0.66	0.92	0.92	0.66	0.66	0.92	0.92	0.92	0.66	0.92	0.66
Heavy Vehicles, %	3	3	2	2	3	3	2	2	2	3	2	3
Mvmt Flow	12	95	0	22	35	86	0	9	60	141	2	5
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.4	8.2	7.5	8.9
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	11%	20%	95%
Vol Thru, %	13%	89%	23%	2%
Vol Right, %	87%	0%	57%	3%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	63	71	100	98
LT Vol	0	8	20	93
Through Vol	8	63	23	2
RT Vol	55	0	57	3
Lane Flow Rate	68	108	143	148
Geometry Grp	1	1	1	1
Degree of Util (X)	0.079	0.139	0.169	0.195
Departure Headway (Hd)	4.156	4.637	4.266	4.761
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	861	773	841	754
Service Time	2.187	2.664	2.291	2.789
HCM Lane V/C Ratio	0.079	0.14	0.17	0.196
HCM Control Delay	7.5	8.4	8.2	8.9
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.3	0.5	0.6	0.7




HCM 6th TWSC
17: Iroquois St & Project Driveway (1)

Lance Drive Residential TIA
Existing Plus Project AM (120 Seconds)

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	7	2	70	83	1
Future Vol, veh/h	2	7	2	70	83	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	8	2	76	90	1
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	171	91	91	0	-	0
Stage 1	91	-	-	-	-	-
Stage 2	80	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	819	967	1504	-	-	-
Stage 1	933	-	-	-	-	-
Stage 2	943	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	818	967	1504	-	-	-
Mov Cap-2 Maneuver	818	-	-	-	-	-
Stage 1	932	-	-	-	-	-
Stage 2	943	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	8.9	0.2		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1504	-	929	-	-	
HCM Lane V/C Ratio	0.001	-	0.011	-	-	
HCM Control Delay (s)	7.4	0	8.9	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	




HCM 6th TWSC
18: Iroquois St & Project Driveway (2)

Lance Drive Residential TIA
Existing Plus Project AM (120 Seconds)

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	8	3	70	90	0
Future Vol, veh/h	2	8	3	70	90	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	9	3	76	98	0
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	180	98	98	0	-	0
Stage 1	98	-	-	-	-	-
Stage 2	82	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	810	958	1495	-	-	-
Stage 1	926	-	-	-	-	-
Stage 2	941	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	808	958	1495	-	-	-
Mov Cap-2 Maneuver	808	-	-	-	-	-
Stage 1	924	-	-	-	-	-
Stage 2	941	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	8.9	0.3		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1495	-	924	-	-	
HCM Lane V/C Ratio	0.002	-	0.012	-	-	
HCM Control Delay (s)	7.4	0	8.9	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	

HCM 6th TWSC
19: Project Driveway (3) & Lance Dr

Lance Drive Residential TIA
Existing Plus Project AM (120 Seconds)

Intersection						
Int Delay, s/veh	1.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	210	1	14	96	4	37
Future Vol, veh/h	210	1	14	96	4	37
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	228	1	15	104	4	40
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	229	0	363	229
Stage 1	-	-	-	-	229	-
Stage 2	-	-	-	-	134	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1339	-	636	810
Stage 1	-	-	-	-	809	-
Stage 2	-	-	-	-	892	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1339	-	628	810
Mov Cap-2 Maneuver	-	-	-	-	628	-
Stage 1	-	-	-	-	809	-
Stage 2	-	-	-	-	881	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		1		9.8	
HCM LOS					A	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	788	-	-	1339	-	
HCM Lane V/C Ratio	0.057	-	-	0.011	-	
HCM Control Delay (s)	9.8	-	-	7.7	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0.2	-	-	0	-	

HCM 6th TWSC
20: Guerneville Rd & Project Driveway (4)























Lance Drive Residential TIA
Existing Plus Project AM (120 Seconds)

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↑↑	
Traffic Vol, veh/h	3	765	545	6	16	8
Future Vol, veh/h	3	765	545	6	16	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	832	592	7	17	9
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	599	0	-	0	1018	300
Stage 1	-	-	-	-	596	-
Stage 2	-	-	-	-	422	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	974	-	-	-	233	696
Stage 1	-	-	-	-	513	-
Stage 2	-	-	-	-	629	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	974	-	-	-	232	696
Mov Cap-2 Maneuver	-	-	-	-	232	-
Stage 1	-	-	-	-	510	-
Stage 2	-	-	-	-	629	-
Approach	EB	WB		SB		
HCM Control Delay, s	0	0		18.2		
HCM LOS				C		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	974	-	-	-	298	
HCM Lane V/C Ratio	0.003	-	-	-	0.088	
HCM Control Delay (s)	8.7	0	-	-	18.2	
HCM Lane LOS	A	A	-	-	C	
HCM 95th %tile Q(veh)	0	-	-	-	0.3	

HCM 6th Signalized Intersection Summary







1: Marlow Rd & Marlow Ct/W Steele Ln

Lance Drive Residential TIA
Existing Plus Project AM (120-140 Seconds)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	3	6	210	2	180	1	498	214	130	480	2
Future Volume (veh/h)	1	3	6	210	2	180	1	498	214	130	480	2
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.96	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	1	3	0	245	0	132	1	579	166	151	558	2
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	10	30	0	1890	0	995	2	731	1152	177	1095	4
Arrive On Green	0.02	0.02	0.00	0.53	0.00	0.53	0.00	0.21	0.21	0.10	0.30	0.30
Sat Flow, veh/h	458	1374	0	3534	0	1566	1767	3526	1502	1767	3603	13
Grp Volume(v), veh/h	4	0	0	245	0	132	1	579	166	151	273	287
Grp Sat Flow(s),veh/h/ln	1833	0	0	1767	0	1566	1767	1763	1502	1767	1763	1853
Q Serve(g_s), s	0.3	0.0	0.0	4.9	0.0	0.0	0.1	21.8	4.5	11.8	17.9	17.9
Cycle Q Clear(g_c), s	0.3	0.0	0.0	4.9	0.0	0.0	0.1	21.8	4.5	11.8	17.9	17.9
Prop In Lane	0.25		0.00	1.00		1.00	1.00		1.00	1.00		0.01
Lane Grp Cap(c), veh/h	40	0	0	1890	0	995	2	731	1152	177	536	563
V/C Ratio(X)	0.10	0.00	0.00	0.13	0.00	0.13	0.42	0.79	0.14	0.85	0.51	0.51
Avail Cap(c_a), veh/h	250	0	0	1890	0	995	77	992	1264	329	744	782
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.59	0.59	0.59	1.00	1.00	1.00
Uniform Delay (d), s/veh	67.1	0.0	0.0	16.3	0.0	10.2	69.8	52.6	5.2	62.0	40.1	40.1
Incr Delay (d2), s/veh	1.1	0.0	0.0	0.1	0.0	0.3	55.9	1.9	0.0	11.0	0.8	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	0.0	2.0	0.0	1.7	0.1	9.8	5.2	5.8	7.9	8.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	68.1	0.0	0.0	16.4	0.0	10.5	125.7	54.5	5.3	72.9	40.9	40.8
LnGrp LOS	E	A	A	B	A	B	F	D	A	E	D	D
Approach Vol, veh/h	4			377				746				711
Approach Delay, s/veh	68.1			14.3				43.7				47.7
Approach LOS	E			B				D				D
Timer - Assigned Phs	2		3	4		6		7	8			
Phs Duration (G+Y+Rc), s	79.5		5.1	47.5		8.0		18.9	33.6			
Change Period (Y+Rc), s	4.6		4.9	4.9		4.9		4.9	4.6			
Max Green Setting (Gmax), s	36.4		6.1	59.1		19.1		26.1	39.4			
Max Q Clear Time (g_c+I1), s	6.9		2.1	19.9		2.3		13.8	23.8			
Green Ext Time (p_c), s	1.3		0.0	3.6		0.0		0.3	3.9			
Intersection Summary												
HCM 6th Ctrl Delay				39.2								
HCM 6th LOS				D								
Notes												
User approved pedestrian interval to be less than phase max green.												
User approved volume balancing among the lanes for turning movement.												






















HCM 6th TWSC
2: Iroquois St/Apple Valley Ln & W Steele Ln

Lance Drive Residential TIA
Existing Plus Project AM (120-140 Seconds)

Intersection												
Int Delay, s/veh	4.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	26	349	48	16	295	16	52	5	34	14	5	38
Future Vol, veh/h	26	349	48	16	295	16	52	5	34	14	5	38
Conflicting Peds, #/hr	12	0	24	24	0	12	4	0	4	4	0	4
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	60	-	-	80	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	31	420	58	19	355	19	63	6	41	17	6	46
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	386	0	0	502	0	0	968	959	477	954	979	381
Stage 1	-	-	-	-	-	-	535	535	-	415	415	-
Stage 2	-	-	-	-	-	-	433	424	-	539	564	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1167	-	-	1057	-	-	232	256	586	237	249	664
Stage 1	-	-	-	-	-	-	527	522	-	613	591	-
Stage 2	-	-	-	-	-	-	599	585	-	525	507	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1154	-	-	1033	-	-	199	236	570	205	230	654
Mov Cap-2 Maneuver	-	-	-	-	-	-	199	236	-	205	230	-
Stage 1	-	-	-	-	-	-	501	496	-	590	574	-
Stage 2	-	-	-	-	-	-	539	568	-	467	482	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.5			0.4			27.7			16.4		
HCM LOS							D			C		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	266	1154	-	-	1033	-	-	385				
HCM Lane V/C Ratio	0.412	0.027	-	-	0.019	-	-	0.178				
HCM Control Delay (s)	27.7	8.2	-	-	8.6	-	-	16.4				
HCM Lane LOS	D	A	-	-	A	-	-	C				
HCM 95th %tile Q(veh)	1.9	0.1	-	-	0.1	-	-	0.6				

HCM 6th Signalized Intersection Summary 3: Range Ave & W Steele Ln

Lance Drive Residential TIA
Existing Plus Project AM (120-140 Seconds)











												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	406	45	44	265	38	37	170	25	26	142	29
Future Volume (veh/h)	40	406	45	44	265	38	37	170	25	26	142	29
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.95	1.00		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	45	461	46	50	301	38	42	193	16	30	161	11
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	807	1298	130	669	1261	159	54	367	30	43	374	25
Arrive On Green	0.78	0.78	0.78	0.78	0.78	0.78	0.03	0.11	0.11	0.02	0.11	0.11
Sat Flow, veh/h	1032	1659	166	884	1612	203	1767	3283	269	1767	3335	225
Grp Volume(v), veh/h	45	0	507	50	0	339	42	103	106	30	84	88
Grp Sat Flow(s),veh/h/ln	1032	0	1825	884	0	1815	1767	1763	1790	1767	1763	1797
Q Serve(g_s), s	1.7	0.0	11.7	2.5	0.0	7.0	3.3	7.7	7.9	2.4	6.2	6.4
Cycle Q Clear(g_c), s	8.7	0.0	11.7	14.3	0.0	7.0	3.3	7.7	7.9	2.4	6.2	6.4
Prop In Lane	1.00		0.09	1.00		0.11	1.00		0.15	1.00		0.13
Lane Grp Cap(c), veh/h	807	0	1427	669	0	1420	54	197	200	43	198	202
V/C Ratio(X)	0.06	0.00	0.36	0.07	0.00	0.24	0.78	0.52	0.53	0.69	0.43	0.43
Avail Cap(c_a), veh/h	807	0	1427	669	0	1420	189	404	410	126	341	348
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.80	0.80	0.80	1.00	1.00	1.00
Uniform Delay (d), s/veh	5.3	0.0	4.6	6.7	0.0	4.1	67.4	58.6	58.7	67.7	57.9	58.0
Incr Delay (d2), s/veh	0.1	0.0	0.7	0.2	0.0	0.4	7.0	0.6	0.7	7.0	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	4.0	0.5	0.0	2.4	1.6	3.4	3.6	1.1	2.8	2.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	5.4	0.0	5.3	7.0	0.0	4.5	74.4	59.3	59.4	74.8	58.5	58.5
LnGrp LOS	A	A	A	A	A	A	E	E	E	E	E	E
Approach Vol, veh/h	552		389			251			202			
Approach Delay, s/veh	5.3		4.8			61.8			60.9			
Approach LOS	A		A			E			E			
Timer - Assigned Phs	2		3		4		6		7		8	
Phs Duration (G+Y+Rc), s	113.1		7.3		19.6		113.1		7.3		19.6	
Change Period (Y+Rc), s	3.6		3.0		3.9		3.6		3.9		* 3.9	
Max Green Setting (Gmax), s	87.4		15.0		27.1		87.4		10.0		* 32	
Max Q Clear Time (g_c+I1), s	13.7		5.3		8.4		16.3		4.4		9.9	
Green Ext Time (p_c), s	1.1		0.0		0.2		0.8		0.0		0.3	
Intersection Summary												
HCM 6th Ctrl Delay	23.4											
HCM 6th LOS	C											
Notes												

HCM 6th Signalized Intersection Summary

4: Marlow Rd & Guerneville Rd

Lance Drive Residential TIA
Existing Plus Project AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	109	445	141	166	284	90	124	463	172	111	484	80
Future Volume (veh/h)	109	445	141	166	284	90	124	463	172	111	484	80
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No				No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	118	484	108	180	309	68	135	503	73	121	526	74
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	143	613	414	207	613	133	161	628	458	209	635	89
Arrive On Green	0.08	0.17	0.17	0.12	0.21	0.21	0.09	0.18	0.18	0.12	0.21	0.21
Sat Flow, veh/h	1767	3526	1556	1767	2876	624	1767	3526	1539	1767	3095	434
Grp Volume(v), veh/h	118	484	108	180	188	189	135	503	73	121	299	301
Grp Sat Flow(s),veh/h/ln	1767	1763	1556	1767	1763	1737	1767	1763	1539	1767	1763	1766
Q Serve(g_s), s	8.5	17.1	2.4	13.0	12.2	12.5	9.8	17.8	0.0	8.4	21.1	21.3
Cycle Q Clear(g_c), s	8.5	17.1	2.4	13.0	12.2	12.5	9.8	17.8	0.0	8.4	21.1	21.3
Prop In Lane	1.00		1.00	1.00		0.36	1.00		1.00	1.00		0.25
Lane Grp Cap(c), veh/h	143	613	414	207	376	370	161	628	458	209	362	362
V/C Ratio(X)	0.82	0.79	0.26	0.87	0.50	0.51	0.84	0.80	0.16	0.58	0.83	0.83
Avail Cap(c_a), veh/h	241	849	518	295	479	472	281	995	619	254	471	471
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.99	0.99	0.99	0.58	0.58	0.58	0.92	0.92	0.92
Uniform Delay (d), s/veh	58.8	51.4	6.0	56.4	45.0	45.2	58.1	51.2	33.9	54.2	49.4	49.5
Incr Delay (d2), s/veh	11.1	3.5	0.3	17.2	4.6	4.9	6.5	1.5	0.1	2.3	8.4	8.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.2	7.7	2.0	6.7	5.7	5.8	4.6	7.8	1.7	3.9	10.0	10.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	70.0	54.9	6.4	73.6	49.7	50.1	64.7	52.7	33.9	56.5	57.8	58.3
LnGrp LOS	E	D	A	E	D	D	E	D	C	E	E	E
Approach Vol, veh/h	710		557				711			721		
Approach Delay, s/veh	50.0		57.6				53.0			57.8		
Approach LOS	D		E				D			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	20.9	28.3	17.2	32.0	15.8	33.4	20.7	28.4				
Change Period (Y+Rc), s	5.7	* 5.7	5.3	5.3	5.3	5.7	5.3	5.3				
Max Green Setting (Gmax), s	11.3	* 31	20.7	34.7	17.7	35.3	18.7	36.7				
Max Q Clear Time (g_c+11.5), s	19.1	19.1	11.8	23.3	10.5	14.5	10.4	19.8				
Green Ext Time (p_c), s	0.2	2.7	0.2	2.7	0.1	2.0	0.2	3.1				

Intersection Summary

HCM 6th Ctrl Delay 54.4

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.







* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary

5: Ridley Ave & Guerneville Rd

Lance Drive Residential TIA
Existing Plus Project AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	692	25	62	480	11	36	4	58	15	4	15
Future Volume (veh/h)	20	692	25	62	480	11	36	4	58	15	4	15
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	0.98		0.96	0.98		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No		No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	22	778	21	70	539	8	40	4	8	17	4	2
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	791	3043	82	612	3088	46	132	15	19	133	29	11
Arrive On Green	0.87	0.87	0.87	1.00	1.00	1.00	0.08	0.08	0.08	0.08	0.08	0.08
Sat Flow, veh/h	852	3504	95	674	3556	53	1056	185	226	1079	356	137
Grp Volume(v), veh/h	22	391	408	70	267	280	52	0	0	23	0	0
Grp Sat Flow(s),veh/h/ln	852	1763	1836	674	1763	1846	1467	0	0	1571	0	0
Q Serve(g_s), s	0.5	5.3	5.3	0.7	0.0	0.0	2.8	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.5	5.3	5.3	6.0	0.0	0.0	4.5	0.0	0.0	1.7	0.0	0.0
Prop In Lane	1.00		0.05	1.00		0.03	0.77		0.15	0.74		0.09
Lane Grp Cap(c), veh/h	791	1531	1594	612	1531	1603	166	0	0	174	0	0
V/C Ratio(X)	0.03	0.26	0.26	0.11	0.17	0.17	0.31	0.00	0.00	0.13	0.00	0.00
Avail Cap(c_a), veh/h	791	1531	1594	612	1531	1603	484	0	0	499	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.93	0.93	0.93	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	1.2	1.6	1.6	0.1	0.0	0.0	60.9	0.0	0.0	59.7	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.4	0.4	0.0	0.0	0.0	0.4	0.0	0.0	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	1.1	1.1	0.0	0.0	0.0	1.8	0.0	0.0	0.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	1.3	1.9	1.9	0.2	0.0	0.0	61.3	0.0	0.0	59.8	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	E	A	A	E	A	A
Approach Vol, veh/h	821				617		52				23	
Approach Delay, s/veh	1.9				0.0		61.3				59.8	
Approach LOS	A				A		E				E	
Timer - Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	125.5		14.5		125.5		14.5					
Change Period (Y+Rc), s	3.9		3.0		3.9		3.0					
Max Green Setting (Gmax), s	90.1		43.0		90.1		43.0					
Max Q Clear Time (g_c+I1), s	7.3		3.7		8.0		6.5					
Green Ext Time (p_c), s	1.5		0.0		1.2		0.1					
Intersection Summary												
HCM 6th Ctrl Delay			4.1									
HCM 6th LOS			A									

HCM 6th Signalized Intersection Summary

6: Lance Dr & Guerneville Rd

Lance Drive Residential TIA
Existing Plus Project AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	39	718	24	22	432	81	12	47	60	163	89	107
Future Volume (veh/h)	39	718	24	22	432	81	12	47	60	163	89	107
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	46	855	27	26	514	70	14	56	47	194	106	117
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	63	889	28	56	886	386	68	260	201	240	110	122
Arrive On Green	0.07	0.51	0.51	0.01	0.08	0.08	0.30	0.30	0.30	0.30	0.30	0.30
Sat Flow, veh/h	1767	3485	110	1767	3526	1536	132	864	668	672	367	405
Grp Volume(v), veh/h	46	432	450	26	514	70	117	0	0	417	0	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1833	1767	1763	1536	1664	0	0	1444	0	0
Q Serve(g_s), s	3.6	33.0	33.0	2.0	19.7	5.9	0.0	0.0	0.0	32.7	0.0	0.0
Cycle Q Clear(g_c), s	3.6	33.0	33.0	2.0	19.7	5.9	7.1	0.0	0.0	39.8	0.0	0.0
Prop In Lane	1.00		0.06	1.00		1.00	0.12		0.40	0.47		0.28
Lane Grp Cap(c), veh/h	63	450	468	56	886	386	529	0	0	472	0	0
V/C Ratio(X)	0.73	0.96	0.96	0.46	0.58	0.18	0.22	0.00	0.00	0.88	0.00	0.00
Avail Cap(c_a), veh/h	135	852	886	135	1705	743	579	0	0	517	0	0
HCM Platoon Ratio	2.00	2.00	2.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.98	0.98	0.98	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	64.3	33.6	33.6	68.1	57.1	50.8	36.7	0.0	0.0	48.4	0.0	0.0
Incr Delay (d2), s/veh	5.9	6.7	6.5	2.1	2.7	1.0	0.1	0.0	0.0	14.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	11.3	11.7	1.0	9.7	2.4	3.1	0.0	0.0	16.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	70.2	40.3	40.1	70.2	59.8	51.8	36.8	0.0	0.0	62.9	0.0	0.0
LnGrp LOS	E	D	D	E	E	D	D	A	A	E	A	A
Approach Vol, veh/h	928			610			117			417		
Approach Delay, s/veh	41.7			59.3			36.8			62.9		
Approach LOS	D			E			D			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.8	41.0		46.7	10.3	40.5		46.7				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		4.6				
Max Green Setting (Gmax), s	67.7	67.7		46.4	10.7	67.7		46.4				
Max Q Clear Time (g_c+14), s	35.0	35.0		41.8	5.6	21.7		9.1				
Green Ext Time (p_c), s	0.0	0.7		0.3	0.0	0.6		0.2				

Intersection Summary

HCM 6th Ctrl Delay	50.9
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

7: N Dutton Ave/Westberry Dr & Guerneville Rd

Lance Drive Residential TIA
Existing Plus Project AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	900	135	234	474	7	92	2	363	20	3	6
Future Volume (veh/h)	3	900	135	234	474	7	92	2	363	20	3	6
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	4	1084	158	282	571	7	112	0	106	24	4	0
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	11	1127	164	1392	2729	33	161	0	709	55	9	0
Arrive On Green	0.01	0.37	0.37	0.81	1.00	1.00	0.05	0.00	0.05	0.04	0.04	0.00
Sat Flow, veh/h	1767	3080	448	3428	3565	44	3534	0	1562	1525	254	0
Grp Volume(v), veh/h	4	619	623	282	282	296	112	0	106	28	0	0
Grp Sat Flow(s), veh/h/ln	1767	1763	1765	1714	1763	1846	1767	0	1562	1779	0	0
Q Serve(g_s), s	0.3	48.1	48.4	2.6	0.0	0.0	4.4	0.0	0.0	2.2	0.0	0.0
Cycle Q Clear(g_c), s	0.3	48.1	48.4	2.6	0.0	0.0	4.4	0.0	0.0	2.2	0.0	0.0
Prop In Lane	1.00		0.25	1.00		0.02	1.00		1.00	0.86		0.00
Lane Grp Cap(c), veh/h	11	645	646	1392	1349	1413	161	0	709	65	0	0
V/C Ratio(X)	0.37	0.96	0.96	0.20	0.21	0.21	0.70	0.00	0.15	0.43	0.00	0.00
Avail Cap(c_a), veh/h	77	698	698	1392	1349	1413	220	0	735	352	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.89	0.89	0.89	0.95	0.95	0.95	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	69.3	43.4	43.5	8.1	0.0	0.0	65.9	0.0	22.6	66.0	0.0	0.0
Incr Delay (d2), s/veh	6.6	25.1	25.7	0.0	0.3	0.3	2.5	0.0	0.0	1.7	0.0	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	0.2	24.8	25.1	0.9	0.1	0.1	2.0	0.0	2.1	1.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	75.9	68.5	69.2	8.1	0.3	0.3	68.3	0.0	22.6	67.7	0.0	0.0
LnGrp LOS	E	E	E	A	A	A	E	A	C	E	A	A
Approach Vol, veh/h	1246			860			218			28		
Approach Delay, s/veh	68.9			2.9			46.1			67.7		
Approach LOS	E			A			D			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	62.1	56.5		9.7	6.2	112.5		11.7				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		5.3				
Max Green Setting (Gmax), s	77.3	55.4		27.7	6.1	77.0		8.7				
Max Q Clear Time (g_c+14.6), s	50.4			4.2	2.3	2.0		6.4				
Green Ext Time (p_c), s	0.0	0.8		0.0	0.0	0.4		0.0				

Intersection Summary

HCM 6th Ctrl Delay 42.6

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 8: Herbert St/Coffey Ln & Guerneville Rd

Lance Drive Residential TIA
Existing Plus Project AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	123	1129	29	17	548	36	20	12	15	75	5	148
Future Volume (veh/h)	123	1129	29	17	548	36	20	12	15	75	5	148
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		0.96	1.00		0.93	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	143	1313	33	20	637	39	23	14	1	87	6	39
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	164	1331	33	601	2108	129	59	36	3	137	9	271
Arrive On Green	0.19	0.76	0.76	0.34	0.63	0.63	0.05	0.05	0.05	0.08	0.08	0.08
Sat Flow, veh/h	1767	3509	88	1767	3365	206	1083	659	47	1658	114	1505
Grp Volume(v), veh/h	143	659	687	20	333	343	38	0	0	93	0	39
Grp Sat Flow(s), veh/h/ln	1767	1763	1834	1767	1763	1808	1789	0	0	1773	0	1505
Q Serve(g_s), s	11.0	50.1	50.4	1.1	12.2	12.2	2.9	0.0	0.0	7.1	0.0	3.1
Cycle Q Clear(g_c), s	11.0	50.1	50.4	1.1	12.2	12.2	2.9	0.0	0.0	7.1	0.0	3.1
Prop In Lane	1.00		0.05	1.00		0.11	0.61		0.03	0.94		1.00
Lane Grp Cap(c), veh/h	164	669	696	601	1104	1132	97	0	0	147	0	271
V/C Ratio(X)	0.87	0.99	0.99	0.03	0.30	0.30	0.39	0.00	0.00	0.63	0.00	0.14
Avail Cap(c_a), veh/h	263	786	818	601	1104	1132	321	0	0	333	0	429
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.74	0.74	0.74	0.95	0.95	0.95	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	56.2	16.5	16.6	30.9	12.0	12.1	63.9	0.0	0.0	62.1	0.0	48.8
Incr Delay (d2), s/veh	7.9	26.7	26.5	0.0	0.7	0.7	0.9	0.0	0.0	1.7	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.8	12.1	12.6	0.5	4.8	4.9	1.3	0.0	0.0	3.3	0.0	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	64.2	43.2	43.1	30.9	12.7	12.7	64.9	0.0	0.0	63.8	0.0	48.9
LnGrp LOS	E	D	D	C	B	B	E	A	A	E	A	D
Approach Vol, veh/h	1489			696			38			132		
Approach Delay, s/veh	45.2			13.2			64.9			59.4		
Approach LOS	D			B			E			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	52.7	58.6		16.5	18.3	93.0		12.2				
Change Period (Y+Rc), s	5.3	5.3		4.9	5.3	5.3		4.6				
Max Green Setting (Gmax), s	62.4	62.4		26.3	20.8	47.7		25.1				
Max Q Clear Time (g_c+11), s	52.4	52.4		9.1	13.0	14.2		4.9				
Green Ext Time (p_c), s	0.0	1.1		0.1	0.0	0.5		0.0				
Intersection Summary												
HCM 6th Ctrl Delay	36.8											
HCM 6th LOS	D											

HCM 6th Signalized Intersection Summary

9: Range Ave & Guerneville Rd

Lance Drive Residential TIA
Existing Plus Project AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	141	761	145	69	422	5	129	86	72	28	98	102
Future Volume (veh/h)	141	761	145	69	422	5	129	86	72	28	98	102
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.96	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No		No				No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	150	810	0	73	449	0	79	173	8	30	104	9
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	246	877		93	570		157	312	14	102	189	16
Arrive On Green	0.14	0.25	0.00	0.05	0.16	0.00	0.09	0.09	0.09	0.06	0.06	0.06
Sat Flow, veh/h	1767	3618	0	1767	3618	0	1767	3513	161	1767	3272	279
Grp Volume(v), veh/h	150	810	0	73	449	0	79	91	90	30	55	58
Grp Sat Flow(s), veh/h/ln	1767	1763	0	1767	1763	0	1767	1856	1819	1767	1763	1788
Q Serve(g_s), s	9.6	26.9	0.0	4.9	14.7	0.0	5.1	5.6	5.7	2.0	3.7	3.8
Cycle Q Clear(g_c), s	9.6	26.9	0.0	4.9	14.7	0.0	5.1	5.6	5.7	2.0	3.7	3.8
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.09	1.00		0.16
Lane Grp Cap(c), veh/h	246	877		93	570		157	165	162	102	102	103
V/C Ratio(X)	0.61	0.92		0.79	0.79		0.50	0.55	0.56	0.29	0.54	0.56
Avail Cap(c_a), veh/h	275	1307		158	1072		492	516	506	161	160	162
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.81	0.81	0.00	0.98	0.98	0.00	1.00	1.00	1.00	0.81	0.81	0.81
Uniform Delay (d), s/veh	48.6	44.0	0.0	56.2	48.3	0.0	52.1	52.4	52.4	54.2	55.0	55.0
Incr Delay (d2), s/veh	1.5	5.3	0.0	5.3	10.3	0.0	0.9	1.1	1.1	0.5	1.3	1.4
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	4.3	12.0	0.0	2.3	7.2	0.0	2.3	2.7	2.7	0.9	1.6	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	50.0	49.2	0.0	61.5	58.7	0.0	53.1	53.4	53.5	54.7	56.3	56.5
LnGrp LOS	D	D		E	E		D	D	D	D	E	E
Approach Vol, veh/h	960		A		522		A		260		143	
Approach Delay, s/veh	49.3				59.1				53.3		56.0	
Approach LOS	D				E				D		E	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	1.6	35.1		12.2	22.0	24.7		15.3				
Change Period (Y+Rc), s	5.3	5.3		5.3	5.3	5.3		4.6				
Max Green Setting (Gmax), s	44.5	44.5		10.9	18.7	36.5		33.4				
Max Q Clear Time (g_c+10), s	28.9	28.9		5.8	11.6	16.7		7.7				
Green Ext Time (p_c), s	0.0	0.9		0.0	0.0	0.6		0.1				

Intersection Summary

HCM 6th Ctrl Delay 53.1

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

10: Guerneville Rd & Steele Wy

Lance Drive Residential TIA
Existing Plus Project AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	794	42	51	463	5	24	10	53	382	16	9
Future Volume (veh/h)	25	794	42	51	463	5	24	10	53	382	16	9
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	28	902	28	58	526	5	19	22	5	447	0	4
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	900	2198	1054	171	587	6	84	88	152	499	0	1022
Arrive On Green	0.51	0.62	0.62	0.05	0.16	0.16	0.05	0.05	0.05	0.14	0.00	0.14
Sat Flow, veh/h	1767	3526	1571	3428	3577	34	1767	1856	1554	3534	0	1566
Grp Volume(v), veh/h	28	902	28	58	259	272	19	22	5	447	0	4
Grp Sat Flow(s), veh/h/ln	1767	1763	1571	1714	1763	1848	1767	1856	1554	1767	0	1566
Q Serve(g_s), s	1.1	18.1	0.8	2.3	20.2	20.2	1.4	1.6	0.4	17.4	0.0	0.0
Cycle Q Clear(g_c), s	1.1	18.1	0.8	2.3	20.2	20.2	1.4	1.6	0.4	17.4	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.02	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	900	2198	1054	171	289	303	84	88	152	499	0	1022
V/C Ratio(X)	0.03	0.41	0.03	0.34	0.90	0.90	0.23	0.25	0.03	0.90	0.00	0.00
Avail Cap(c_a), veh/h	900	2198	1054	198	631	661	346	363	383	886	0	1193
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.90	0.90	0.90	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.1	13.3	7.7	64.3	57.3	57.3	64.2	64.3	57.2	59.1	0.0	8.6
Incr Delay (d2), s/veh	0.0	0.5	0.0	0.4	3.9	3.8	0.5	0.5	0.0	2.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	7.2	0.3	1.0	9.2	9.7	0.7	0.8	0.2	8.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.1	13.9	7.8	64.7	61.3	61.1	64.7	64.8	57.2	61.7	0.0	8.6
LnGrp LOS	B	B	A	E	E	E	E	E	E	E	A	A
Approach Vol, veh/h	958			589			46			451		
Approach Delay, s/veh	13.8			61.5			63.9			61.2		
Approach LOS	B			E			E			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	1.9	92.2		24.7	76.2	27.9		11.3				
Change Period (Y+Rc), s	4.9	4.9		4.9	4.9	4.9		4.6				
Max Green Setting (Gmax), s	50.1			35.1	8.1	50.1		27.4				
Max Q Clear Time (g_c+14), s	20.1			19.4	3.1	22.2		3.6				
Green Ext Time (p_c), s	0.0	1.2		0.1	0.0	0.5		0.0				

Intersection Summary

HCM 6th Ctrl Delay 39.1

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

11: Cleveland Ave & Guerneville Rd

Lance Drive Residential TIA
Existing Plus Project AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰ ↱	↑ ↑		↰ ↱	↑ ↑	↱	↰	↑ ↑		↰ ↱	↱ ↰	
Traffic Volume (veh/h)	52	1179	32	172	826	184	28	87	141	223	63	34
Future Volume (veh/h)	52	1179	32	172	826	184	28	87	141	223	63	34
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	57	1296	32	189	908	118	31	96	48	245	69	25
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	235	1394	34	236	968	422	746	978	458	335	123	44
Arrive On Green	0.07	0.27	0.27	0.07	0.27	0.27	0.42	0.42	0.42	0.09	0.09	0.09
Sat Flow, veh/h	3428	5081	125	3428	3526	1536	1767	2317	1084	3534	1292	468
Grp Volume(v), veh/h	57	861	467	189	908	118	31	71	73	245	0	94
Grp Sat Flow(s), veh/h/ln	1714	1689	1830	1714	1763	1536	1767	1763	1639	1767	0	1761
Q Serve(g_s), s	2.2	34.8	34.8	7.6	35.2	8.5	1.4	3.4	3.7	9.4	0.0	7.1
Cycle Q Clear(g_c), s	2.2	34.8	34.8	7.6	35.2	8.5	1.4	3.4	3.7	9.4	0.0	7.1
Prop In Lane	1.00		0.07	1.00		1.00	1.00		0.66	1.00		0.27
Lane Grp Cap(c), veh/h	235	926	502	236	968	422	746	744	692	335	0	167
V/C Ratio(X)	0.24	0.93	0.93	0.80	0.94	0.28	0.04	0.10	0.10	0.73	0.00	0.56
Avail Cap(c_a), veh/h	235	1257	681	394	1488	648	746	744	692	1088	0	542
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.75	0.75	0.75	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	61.8	49.5	49.5	64.3	49.6	39.9	23.8	24.4	24.5	61.6	0.0	60.6
Incr Delay (d2), s/veh	0.2	8.5	13.9	1.8	5.1	0.1	0.1	0.3	0.3	1.2	0.0	1.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	15.6	17.7	3.4	16.0	3.2	0.6	1.5	1.5	4.3	0.0	3.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	62.0	58.0	63.4	66.1	54.7	40.0	23.9	24.6	24.8	62.8	0.0	61.7
LnGrp LOS	E	E	E	E	D	D	C	C	C	E	A	E
Approach Vol, veh/h	1385			1215			175			339		
Approach Delay, s/veh	60.0			55.0			24.5			62.5		
Approach LOS	E			E			C			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.5	43.3		64.0	14.5	43.3		18.2				
Change Period (Y+Rc), s	4.9	4.9		4.9	4.9	4.9		4.9				
Max Green Setting (Gmax), s	52.1	52.1		9.1	9.1	59.1		43.1				
Max Q Clear Time (g_c+1.6), s	36.8	36.8		5.7	4.2	37.2		11.4				
Green Ext Time (p_c), s	0.0	1.6		0.0	0.0	1.2		0.1				

Intersection Summary

HCM 6th Ctrl Delay 56.3

HCM 6th LOS E

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 12: US 101 SB Ramps & Guerneville Rd

Lance Drive Residential TIA
Existing Plus Project AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑					↑	↑	↑
Traffic Volume (veh/h)	0	1043	506	254	902	0	0	0	0	344	2	281
Future Volume (veh/h)	0	1043	506	254	902	0	0	0	0	344	2	281
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1856	1856	1856	1856	0				1856	1856	1856
Adj Flow Rate, veh/h	0	1172	231	285	1013	0				388	0	278
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89				0.89	0.89	0.89
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	1275	388	331	1351	0				1940	0	863
Arrive On Green	0.00	0.25	0.25	0.10	0.38	0.00				0.55	0.00	0.55
Sat Flow, veh/h	0	5233	1544	3428	3618	0				3534	0	1572
Grp Volume(v), veh/h	0	1172	231	285	1013	0				388	0	278
Grp Sat Flow(s),veh/h/ln	0	1689	1544	1714	1763	0				1767	0	1572
Q Serve(g_s), s	0.0	31.5	18.4	11.5	34.8	0.0				7.8	0.0	13.6
Cycle Q Clear(g_c), s	0.0	31.5	18.4	11.5	34.8	0.0				7.8	0.0	13.6
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1275	388	331	1351	0				1940	0	863
V/C Ratio(X)	0.00	0.92	0.59	0.86	0.75	0.00				0.20	0.00	0.32
Avail Cap(c_a), veh/h	0	2066	630	566	2143	0				1940	0	863
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.35	0.35	0.84	0.84	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	51.0	46.1	62.3	37.4	0.0				16.0	0.0	17.3
Incr Delay (d2), s/veh	0.0	1.1	0.2	2.4	0.3	0.0				0.2	0.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	13.3	7.1	5.1	14.9	0.0				3.1	0.0	5.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	52.1	46.3	64.7	37.6	0.0				16.2	0.0	18.3
LnGrp LOS	A	D	D	E	D	A				B	A	B
Approach Vol, veh/h		1403			1298						666	
Approach Delay, s/veh		51.2			43.6						17.1	
Approach LOS		D			D						B	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	8.4	40.1		81.5		58.5						
Change Period (Y+Rc), s	4.9	4.9		4.6		4.9						
Max Green Setting (Gmax), s	28.5	57.1		45.4		85.1						
Max Q Clear Time (g_c+I1), s	13.5	33.5		15.6		36.8						
Green Ext Time (p_c), s	0.0	1.7		0.1		1.4						

Intersection Summary

HCM 6th Ctrl Delay 41.5
HCM 6th LOS D

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 13: US 101 NB Ramps & Guerneville Rd/Steele Ln

Lance Drive Residential TIA
Existing Plus Project AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↑↑			↑↑↑		↰	↰↱	↰			
Traffic Volume (veh/h)	400	987	0	0	791	203	365	1	411	0	0	0
Future Volume (veh/h)	400	987	0	0	791	203	365	1	411	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1856	1856	0	0	1856	1856	1856	1856	1856			
Adj Flow Rate, veh/h	449	1109	0	0	889	200	503	0	200			
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89			
Percent Heavy Veh, %	3	3	0	0	3	3	3	3	3			
Cap, veh/h	1735	2740	0	0	972	217	548	0	244			
Arrive On Green	1.00	1.00	0.00	0.00	0.24	0.24	0.16	0.00	0.16			
Sat Flow, veh/h	3428	3618	0	0	4284	921	3534	0	1572			
Grp Volume(v), veh/h	449	1109	0	0	728	361	503	0	200			
Grp Sat Flow(s),veh/h/ln	1714	1763	0	0	1689	1661	1767	0	1572			
Q Serve(g_s), s	0.0	0.0	0.0	0.0	29.4	29.7	19.6	0.0	17.2			
Cycle Q Clear(g_c), s	0.0	0.0	0.0	0.0	29.4	29.7	19.6	0.0	17.2			
Prop In Lane	1.00		0.00	0.00		0.55	1.00		1.00			
Lane Grp Cap(c), veh/h	1735	2740	0	0	797	392	548	0	244			
V/C Ratio(X)	0.26	0.40	0.00	0.00	0.91	0.92	0.92	0.00	0.82			
Avail Cap(c_a), veh/h	1735	2740	0	0	1209	594	1171	0	521			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.56	0.56	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.0	0.0	0.0	0.0	52.1	52.2	58.3	0.0	57.3			
Incr Delay (d2), s/veh	0.0	0.2	0.0	0.0	5.6	11.1	2.7	0.0	2.6			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	0.1	0.0	0.0	13.0	13.5	8.8	0.0	6.9			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.2	0.0	0.0	57.7	63.3	61.0	0.0	59.9			
LnGrp LOS	A	A	A	A	E	E	E	A	E			
Approach Vol, veh/h	1558			1089			703					
Approach Delay, s/veh	0.2			59.5			60.7					
Approach LOS	A			E			E					
Timer - Assigned Phs	2			5			6			8		
Phs Duration (G+Y+Rc), s	113.7			75.7			38.0			26.3		
Change Period (Y+Rc), s	4.9			4.9			4.9			4.6		
Max Green Setting (Gmax), s	84.1			29.1			50.1			46.4		
Max Q Clear Time (g_c+I1), s	2.0			2.0			31.7			21.6		
Green Ext Time (p_c), s	1.6			0.1			1.4			0.1		

Intersection Summary

HCM 6th Ctrl Delay	32.2
HCM 6th LOS	C

Notes










User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

14: Stony Point Rd/Marlow Rd & W College Ave

Lance Drive Residential TIA
Existing Plus Project AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	75	338	135	154	183	117	73	574	159	164	562	65
Future Volume (veh/h)	75	338	135	154	183	117	73	574	159	164	562	65
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	83	376	114	171	203	44	81	638	91	182	624	65
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	552	451	135	619	599	127	102	745	875	208	873	91
Arrive On Green	0.31	0.17	0.17	0.35	0.21	0.21	0.06	0.21	0.21	0.12	0.27	0.27
Sat Flow, veh/h	1767	2661	795	1767	2890	613	1767	3526	1537	1767	3215	334
Grp Volume(v), veh/h	83	247	243	171	122	125	81	638	91	182	342	347
Grp Sat Flow(s),veh/h/ln	1767	1763	1693	1767	1763	1741	1767	1763	1537	1767	1763	1787
Q Serve(g_s), s	4.7	19.0	19.5	9.7	8.3	8.6	6.3	24.4	1.8	14.2	24.5	24.6
Cycle Q Clear(g_c), s	4.7	19.0	19.5	9.7	8.3	8.6	6.3	24.4	1.8	14.2	24.5	24.6
Prop In Lane	1.00		0.47	1.00		0.35	1.00		1.00	1.00		0.19
Lane Grp Cap(c), veh/h	552	299	287	619	365	361	102	745	875	208	479	485
V/C Ratio(X)	0.15	0.83	0.85	0.28	0.33	0.35	0.80	0.86	0.10	0.87	0.71	0.72
Avail Cap(c_a), veh/h	552	387	371	619	512	506	173	924	954	324	613	622
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.47	0.47	0.47	1.00	1.00	1.00	0.66	0.66	0.66
Uniform Delay (d), s/veh	34.7	56.2	56.4	32.7	47.3	47.4	65.2	53.2	5.0	60.7	46.1	46.1
Incr Delay (d2), s/veh	0.1	11.0	13.2	0.1	0.3	0.3	13.2	6.7	0.1	10.5	1.9	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	9.2	9.3	4.2	3.6	3.7	3.2	11.3	0.7	6.9	10.8	11.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.8	67.2	69.6	32.8	47.5	47.7	78.4	59.9	5.0	71.2	47.9	48.0
LnGrp LOS	C	E	E	C	D	D	E	E	A	E	D	D
Approach Vol, veh/h	573				418		810				871	
Approach Delay, s/veh	63.5				41.6		55.6				52.8	
Approach LOS	E				D		E				D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	54.3	29.0	13.3	43.3	49.1	34.3	21.8	34.9				
Change Period (Y+Rc), s	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3				
Max Green Setting (Gmax), s	25.3	30.7	13.7	48.7	15.7	40.7	25.7	36.7				
Max Q Clear Time (g_c+I1), s	21.5	21.5	8.3	26.6	6.7	10.6	16.2	26.4				
Green Ext Time (p_c), s	0.4	1.9	0.1	4.0	0.1	1.3	0.3	3.2				

Intersection Summary

HCM 6th Ctrl Delay 54.2

HCM 6th LOS D

Notes









User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

15: N Dutton Ave & W College Ave

Lance Drive Residential TIA
Existing Plus Project AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	84	673	89	81	502	277	75	354	93	204	228	49
Future Volume (veh/h)	84	673	89	81	502	277	75	354	93	204	228	49
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	90	724	86	87	540	217	81	381	80	219	245	36
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	111	787	93	108	621	249	676	440	91	766	624	90
Arrive On Green	0.06	0.25	0.25	0.06	0.25	0.25	0.38	0.15	0.15	0.43	0.20	0.20
Sat Flow, veh/h	1767	3166	376	1767	2453	982	1767	2893	601	1767	3081	446
Grp Volume(v), veh/h	90	403	407	87	388	369	81	230	231	219	139	142
Grp Sat Flow(s),veh/h/ln	1767	1763	1779	1767	1763	1672	1767	1763	1731	1767	1763	1764
Q Serve(g_s), s	7.0	31.2	31.2	6.8	29.5	29.7	4.2	17.9	18.2	11.2	9.5	9.8
Cycle Q Clear(g_c), s	7.0	31.2	31.2	6.8	29.5	29.7	4.2	17.9	18.2	11.2	9.5	9.8
Prop In Lane	1.00		0.21	1.00		0.59	1.00		0.35	1.00		0.25
Lane Grp Cap(c), veh/h	111	438	442	108	446	423	676	268	263	766	357	357
V/C Ratio(X)	0.81	0.92	0.92	0.81	0.87	0.87	0.12	0.86	0.88	0.29	0.39	0.40
Avail Cap(c_a), veh/h	189	618	624	252	681	646	676	530	520	766	568	568
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.68	0.68	0.68	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	64.8	51.2	51.2	64.9	50.0	50.1	27.9	57.9	58.1	25.7	48.3	48.4
Incr Delay (d2), s/veh	3.7	9.1	9.2	5.3	5.1	5.6	0.0	3.1	3.6	0.1	0.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	14.7	14.9	3.2	13.5	13.0	1.8	8.2	8.2	4.7	4.2	4.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	68.4	60.4	60.4	70.2	55.1	55.7	28.0	61.0	61.7	25.7	48.6	48.7
LnGrp LOS	E	E	E	E	E	E	C	E	E	C	D	D
Approach Vol, veh/h	900				844				542		500	
Approach Delay, s/veh	61.2				56.9				56.4		38.6	
Approach LOS	E				E				E		D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	2.4	38.7	56.6	32.3	11.8	39.4	63.7	25.2				
Change Period (Y+Rc), s	3.9	* 3.9	3.0	3.9	3.0	3.9	3.0	3.9				
Max Green Setting (Gmax), s	49.0	* 49	12.0	45.1	15.0	54.1	15.0	42.1				
Max Q Clear Time (g_c+1/3), s	33.2	33.2	6.2	11.8	9.0	31.7	13.2	20.2				
Green Ext Time (p_c), s	0.0	1.6	0.0	0.5	0.0	1.6	0.0	0.9				

Intersection Summary

HCM 6th Ctrl Delay 54.9

HCM 6th LOS D

Notes





User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection

Intersection Delay, s/veh 8.4

Intersection LOS A




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	8	63	0	20	23	57	0	8	55	93	2	3
Future Vol, veh/h	8	63	0	20	23	57	0	8	55	93	2	3
Peak Hour Factor	0.66	0.66	0.92	0.92	0.66	0.66	0.92	0.92	0.92	0.66	0.92	0.66
Heavy Vehicles, %	3	3	2	2	3	3	2	2	2	3	2	3
Mvmt Flow	12	95	0	22	35	86	0	9	60	141	2	5
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.4	8.2	7.5	8.9
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	11%	20%	95%
Vol Thru, %	13%	89%	23%	2%
Vol Right, %	87%	0%	57%	3%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	63	71	100	98
LT Vol	0	8	20	93
Through Vol	8	63	23	2
RT Vol	55	0	57	3
Lane Flow Rate	68	108	143	148
Geometry Grp	1	1	1	1
Degree of Util (X)	0.079	0.139	0.169	0.195
Departure Headway (Hd)	4.156	4.637	4.266	4.761
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	861	773	841	754
Service Time	2.187	2.664	2.291	2.789
HCM Lane V/C Ratio	0.079	0.14	0.17	0.196
HCM Control Delay	7.5	8.4	8.2	8.9
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.3	0.5	0.6	0.7




HCM 6th TWSC
17: Iroquois St & Project Driveway (1)

Lance Drive Residential TIA
Existing Plus Project AM (120-140 Seconds)

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	7	2	70	83	1
Future Vol, veh/h	2	7	2	70	83	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	8	2	76	90	1
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	171	91	91	0	-	0
Stage 1	91	-	-	-	-	-
Stage 2	80	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	819	967	1504	-	-	-
Stage 1	933	-	-	-	-	-
Stage 2	943	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	818	967	1504	-	-	-
Mov Cap-2 Maneuver	818	-	-	-	-	-
Stage 1	932	-	-	-	-	-
Stage 2	943	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	8.9	0.2		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1504	-	929	-	-	
HCM Lane V/C Ratio	0.001	-	0.011	-	-	
HCM Control Delay (s)	7.4	0	8.9	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	




HCM 6th TWSC
18: Iroquois St & Project Driveway (2)

Lance Drive Residential TIA
Existing Plus Project AM (120-140 Seconds)

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	8	3	70	90	0
Future Vol, veh/h	2	8	3	70	90	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	9	3	76	98	0
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	180	98	98	0	-	0
Stage 1	98	-	-	-	-	-
Stage 2	82	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	810	958	1495	-	-	-
Stage 1	926	-	-	-	-	-
Stage 2	941	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	808	958	1495	-	-	-
Mov Cap-2 Maneuver	808	-	-	-	-	-
Stage 1	924	-	-	-	-	-
Stage 2	941	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	8.9	0.3		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1495	-	924	-	-	
HCM Lane V/C Ratio	0.002	-	0.012	-	-	
HCM Control Delay (s)	7.4	0	8.9	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	

HCM 6th TWSC
19: Project Driveway (3) & Lance Dr

Lance Drive Residential TIA
Existing Plus Project AM (120-140 Seconds)

Intersection						
Int Delay, s/veh	1.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	210	1	14	96	4	37
Future Vol, veh/h	210	1	14	96	4	37
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	228	1	15	104	4	40
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	229	0	363	229
Stage 1	-	-	-	-	229	-
Stage 2	-	-	-	-	134	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1339	-	636	810
Stage 1	-	-	-	-	809	-
Stage 2	-	-	-	-	892	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1339	-	628	810
Mov Cap-2 Maneuver	-	-	-	-	628	-
Stage 1	-	-	-	-	809	-
Stage 2	-	-	-	-	881	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		1		9.8	
HCM LOS	A					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	788	-	-	1339	-	
HCM Lane V/C Ratio	0.057	-	-	0.011	-	
HCM Control Delay (s)	9.8	-	-	7.7	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0.2	-	-	0	-	

HCM 6th TWSC
20: Guerneville Rd & Project Driveway (4)























Lance Drive Residential TIA
Existing Plus Project AM (120-140 Seconds)

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑	↑↑		↑↑	
Traffic Vol, veh/h	3	765	545	6	16	8
Future Vol, veh/h	3	765	545	6	16	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	832	592	7	17	9
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	599	0	-	0	1018	300
Stage 1	-	-	-	-	596	-
Stage 2	-	-	-	-	422	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	974	-	-	-	233	696
Stage 1	-	-	-	-	513	-
Stage 2	-	-	-	-	629	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	974	-	-	-	232	696
Mov Cap-2 Maneuver	-	-	-	-	232	-
Stage 1	-	-	-	-	510	-
Stage 2	-	-	-	-	629	-
Approach	EB	WB		SB		
HCM Control Delay, s	0	0		18.2		
HCM LOS				C		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	974	-	-	-	298	
HCM Lane V/C Ratio	0.003	-	-	-	0.088	
HCM Control Delay (s)	8.7	0	-	-	18.2	
HCM Lane LOS	A	A	-	-	C	
HCM 95th %tile Q(veh)	0	-	-	-	0.3	

HCM 6th Signalized Intersection Summary







1: Marlow Rd & Marlow Ct/W Steele Ln

Lance Drive Residential TIA
Existing Plus Project PM (95-120 Seconds)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	0	2	163	4	142	5	624	161	117	708	2
Future Volume (veh/h)	2	0	2	163	4	142	5	624	161	117	708	2
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.96	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	2	0	0	175	0	91	5	657	116	123	745	2
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	42	0	0	1902	0	931	11	739	1164	98	933	3
Arrive On Green	0.02	0.00	0.00	0.54	0.00	0.54	0.01	0.21	0.21	0.06	0.26	0.26
Sat Flow, veh/h	1767	0	0	3534	0	1568	1767	3526	1514	1767	3607	10
Grp Volume(v), veh/h	2	0	0	175	0	91	5	657	116	123	364	383
Grp Sat Flow(s),veh/h/ln	1767	0	0	1767	0	1568	1767	1763	1514	1767	1763	1854
Q Serve(g_s), s	0.1	0.0	0.0	2.6	0.0	0.0	0.3	19.9	2.3	6.1	21.2	21.2
Cycle Q Clear(g_c), s	0.1	0.0	0.0	2.6	0.0	0.0	0.3	19.9	2.3	6.1	21.2	21.2
Prop In Lane	1.00		0.00	1.00		1.00	1.00		1.00	1.00		0.01
Lane Grp Cap(c), veh/h	42	0	0	1902	0	931	11	739	1164	98	456	479
V/C Ratio(X)	0.05	0.00	0.00	0.09	0.00	0.10	0.44	0.89	0.10	1.26	0.80	0.80
Avail Cap(c_a), veh/h	482	0	0	1902	0	931	80	769	1177	98	456	479
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.63	0.63	0.63	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.5	0.0	0.0	12.3	0.0	9.6	54.4	42.2	3.8	52.0	38.1	38.1
Incr Delay (d2), s/veh	0.5	0.0	0.0	0.1	0.0	0.2	15.9	8.2	0.0	174.3	9.7	9.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.0	1.1	0.0	0.9	0.2	9.3	2.6	7.4	10.2	10.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.9	0.0	0.0	12.4	0.0	9.8	70.3	50.4	3.8	226.3	47.8	47.4
LnGrp LOS	D	A	A	B	A	A	E	D	A	F	D	D
Approach Vol, veh/h		2			266			778			870	
Approach Delay, s/veh		52.9			11.5			43.6			72.8	
Approach LOS		D			B			D			E	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		63.8	5.6	33.3		7.2	11.0	28.0				
Change Period (Y+Rc), s		4.6	4.9	4.9		4.6	4.9	4.9				
Max Green Setting (Gmax), s		30.9	5.0	25.1		30.0	6.1	24.0				
Max Q Clear Time (g_c+I1), s		4.6	2.3	23.2		2.1	8.1	21.9				
Green Ext Time (p_c), s		0.9	0.0	0.9		0.0	0.0	1.0				
Intersection Summary												
HCM 6th Ctrl Delay				52.4								
HCM 6th LOS				D								
Notes												
User approved pedestrian interval to be less than phase max green.												
User approved volume balancing among the lanes for turning movement.												

HCM 6th TWSC
2: Iroquois St/Apple Valley Ln & W Steele Ln

Lance Drive Residential TIA
Existing Plus Project PM (95-120 Seconds)

Intersection												
Int Delay, s/veh	3.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	24	278	50	50	438	37	47	4	27	22	9	23
Future Vol, veh/h	24	278	50	50	438	37	47	4	27	22	9	23
Conflicting Peds, #/hr	9	0	9	9	0	9	1	0	2	2	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	60	-	-	80	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	25	293	53	53	461	39	49	4	28	23	9	24






















Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	509	0	0	355	0	0	983	994	331	984	1001	491
Stage 1	-	-	-	-	-	-	379	379	-	596	596	-
Stage 2	-	-	-	-	-	-	604	615	-	388	405	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1051	-	-	1198	-	-	227	244	708	227	242	575
Stage 1	-	-	-	-	-	-	641	613	-	488	490	-
Stage 2	-	-	-	-	-	-	484	481	-	634	597	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1042	-	-	1188	-	-	197	223	701	202	221	570
Mov Cap-2 Maneuver	-	-	-	-	-	-	197	223	-	202	221	-
Stage 1	-	-	-	-	-	-	620	593	-	472	464	-
Stage 2	-	-	-	-	-	-	433	455	-	588	577	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.6			0.8			24.7			20.8		
HCM LOS							C			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	264	1042	-	-	1188	-	-	284
HCM Lane V/C Ratio	0.311	0.024	-	-	0.044	-	-	0.2
HCM Control Delay (s)	24.7	8.5	-	-	8.2	-	-	20.8
HCM Lane LOS	C	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	1.3	0.1	-	-	0.1	-	-	0.7

HCM 6th Signalized Intersection Summary 3: Range Ave & W Steele Ln

Lance Drive Residential TIA
Existing Plus Project PM (95-120 Seconds)











												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	308	61	56	418	44	81	191	40	58	418	48
Future Volume (veh/h)	35	308	61	56	418	44	81	191	40	58	418	48
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.96	1.00		0.93
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	36	321	57	58	435	42	84	199	24	60	435	39
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	561	1002	178	637	1091	105	107	455	54	142	564	50
Arrive On Green	0.66	0.66	0.66	0.66	0.66	0.66	0.06	0.14	0.14	0.08	0.17	0.17
Sat Flow, veh/h	909	1529	272	995	1665	161	1767	3158	375	1767	3249	290
Grp Volume(v), veh/h	36	0	378	58	0	477	84	110	113	60	235	239
Grp Sat Flow(s),veh/h/ln	909	0	1801	995	0	1826	1767	1763	1771	1767	1763	1776
Q Serve(g_s), s	1.8	0.0	8.7	2.6	0.0	11.6	4.5	5.4	5.6	3.1	12.1	12.2
Cycle Q Clear(g_c), s	13.4	0.0	8.7	11.3	0.0	11.6	4.5	5.4	5.6	3.1	12.1	12.2
Prop In Lane	1.00		0.15	1.00		0.09	1.00		0.21	1.00		0.16
Lane Grp Cap(c), veh/h	561	0	1180	637	0	1197	107	254	255	142	306	308
V/C Ratio(X)	0.06	0.00	0.32	0.09	0.00	0.40	0.78	0.43	0.44	0.42	0.77	0.78
Avail Cap(c_a), veh/h	561	0	1180	637	0	1197	223	466	468	205	447	450
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.46	0.46	0.46	1.00	1.00	1.00
Uniform Delay (d), s/veh	10.8	0.0	7.1	9.6	0.0	7.6	44.0	37.1	37.2	41.6	37.4	37.5
Incr Delay (d2), s/veh	0.2	0.0	0.7	0.3	0.0	1.0	2.2	0.2	0.2	0.7	2.4	2.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	3.1	0.6	0.0	4.2	2.0	2.3	2.3	1.3	5.2	5.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.0	0.0	7.9	9.9	0.0	8.6	46.2	37.3	37.4	42.3	39.8	40.2
LnGrp LOS	B	A	A	A	A	A	D	D	D	D	D	D
Approach Vol, veh/h		414			535			307			534	
Approach Delay, s/veh		8.1			8.8			39.8			40.3	
Approach LOS		A			A			D			D	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		65.9	8.8	20.4		65.9	11.5	17.6				
Change Period (Y+Rc), s		3.6	3.0	3.9		3.6	3.9	* 3.9				
Max Green Setting (Gmax), s		48.4	12.0	24.1		48.4	11.0	* 25				
Max Q Clear Time (g_c+I1), s		15.4	6.5	14.2		13.6	5.1	7.6				
Green Ext Time (p_c), s		0.8	0.0	0.7		1.1	0.0	0.3				
Intersection Summary												
HCM 6th Ctrl Delay			23.3									
HCM 6th LOS			C									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

HCM 6th Signalized Intersection Summary

4: Marlow Rd & Guerneville Rd

Lance Drive Residential TIA
Existing Plus Project PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	166	420	117	274	461	110	130	599	186	65	700	67
Future Volume (veh/h)	166	420	117	274	461	110	130	599	186	65	700	67
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	175	442	66	288	485	96	137	631	116	68	737	65
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	186	637	404	230	614	121	141	799	553	220	887	78
Arrive On Green	0.11	0.18	0.18	0.13	0.21	0.21	0.08	0.23	0.23	0.12	0.27	0.27
Sat Flow, veh/h	1767	3526	1536	1767	2923	575	1767	3526	1537	1767	3271	288
Grp Volume(v), veh/h	175	442	66	288	291	290	137	631	116	68	397	405
Grp Sat Flow(s),veh/h/ln	1767	1763	1536	1767	1763	1736	1767	1763	1537	1767	1763	1797
Q Serve(g_s), s	9.3	11.2	1.4	12.4	14.9	15.0	7.3	16.0	0.0	3.3	20.1	20.2
Cycle Q Clear(g_c), s	9.3	11.2	1.4	12.4	14.9	15.0	7.3	16.0	0.0	3.3	20.1	20.2
Prop In Lane	1.00		1.00	1.00		0.33	1.00		1.00	1.00		0.16
Lane Grp Cap(c), veh/h	186	637	404	230	370	364	141	799	553	220	478	487
V/C Ratio(X)	0.94	0.69	0.16	1.25	0.79	0.80	0.97	0.79	0.21	0.31	0.83	0.83
Avail Cap(c_a), veh/h	186	1006	564	230	479	471	141	1054	664	220	557	567
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.97	0.97	0.97	0.46	0.46	0.46	0.70	0.70	0.70
Uniform Delay (d), s/veh	42.2	36.4	7.1	41.3	35.5	35.6	43.6	34.6	21.2	37.9	32.6	32.6
Incr Delay (d2), s/veh	49.1	1.4	0.2	143.0	15.1	15.9	42.8	1.4	0.1	0.6	6.6	6.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.5	4.7	0.8	14.3	7.7	7.7	4.8	6.7	1.7	1.4	9.1	9.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	91.3	37.8	7.3	184.3	50.6	51.5	86.4	36.0	21.3	38.4	39.1	39.1
LnGrp LOS	F	D	A	F	D	D	F	D	C	D	D	D
Approach Vol, veh/h	683			869			884			870		
Approach Delay, s/veh	48.6			95.2			41.9			39.0		
Approach LOS	D			F			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	22.9	12.9	31.1	15.3	25.6	17.1	26.8					
Change Period (Y+Rc), s	5.7	5.7	5.3	5.3	5.3	5.7	5.3	5.3				
Max Green Setting (Gmax), s	27	27	7.6	30.0	10.0	25.8	9.2	28.4				
Max Q Clear Time (g_c+14.4), s	13.2	13.2	9.3	22.2	11.3	17.0	5.3	18.0				
Green Ext Time (p_c), s	0.0	2.5	0.0	3.0	0.0	2.2	0.0	3.2				

Intersection Summary

HCM 6th Ctrl Delay 56.5

HCM 6th LOS E

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary

5: Ridley Ave & Guerneville Rd

Lance Drive Residential TIA
Existing Plus Project PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	669	33	66	814	2	14	0	46	3	0	8
Future Volume (veh/h)	5	669	33	66	814	2	14	0	46	3	0	8
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	0.99		0.98	0.99		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	5	719	26	71	875	2	15	0	9	3	0	0
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	633	3082	111	685	3205	7	94	3	22	136	0	0
Arrive On Green	0.89	0.89	0.89	1.00	1.00	1.00	0.04	0.00	0.04	0.04	0.00	0.00
Sat Flow, veh/h	627	3470	125	709	3608	8	831	87	551	1534	0	0
Grp Volume(v), veh/h	5	365	380	71	427	450	24	0	0	3	0	0
Grp Sat Flow(s),veh/h/ln	627	1763	1833	709	1763	1854	1469	0	0	1534	0	0
Q Serve(g_s), s	0.1	2.8	2.8	0.4	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.1	2.8	2.8	3.1	0.0	0.0	1.5	0.0	0.0	0.2	0.0	0.0
Prop In Lane	1.00		0.07	1.00		0.00	0.62		0.37	1.00		0.00
Lane Grp Cap(c), veh/h	633	1566	1628	685	1566	1647	119	0	0	136	0	0
V/C Ratio(X)	0.01	0.23	0.23	0.10	0.27	0.27	0.20	0.00	0.00	0.02	0.00	0.00
Avail Cap(c_a), veh/h	633	1566	1628	685	1566	1647	504	0	0	505	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.92	0.92	0.92	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.6	0.7	0.7	0.1	0.0	0.0	44.5	0.0	0.0	43.9	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.3	0.3	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.1	0.1	0.0	0.0	0.0	0.6	0.0	0.0	0.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.6	1.1	1.1	0.1	0.0	0.0	44.8	0.0	0.0	44.0	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	D	A	A	D	A	A
Approach Vol, veh/h	750			948			24			3		
Approach Delay, s/veh	1.1			0.0			44.8			44.0		
Approach LOS	A			A			D			D		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	88.3			6.7			88.3			6.7		
Change Period (Y+Rc), s	3.9			3.0			3.9			3.0		
Max Green Setting (Gmax), s	59.1			29.0			59.1			29.0		
Max Q Clear Time (g_c+I1), s	4.8			2.2			5.1			3.5		
Green Ext Time (p_c), s	1.4			0.0			1.9			0.0		

Intersection Summary

HCM 6th Ctrl Delay	1.2
HCM 6th LOS	A

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary 6: Lance Dr & Guerneville Rd

Lance Drive Residential TIA
Existing Plus Project PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	108	575	11	53	862	225	4	38	37	124	40	64
Future Volume (veh/h)	108	575	11	53	862	225	4	38	37	124	40	64
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.99	0.99		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	112	599	10	55	898	216	4	40	4	129	42	55
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	138	660	11	296	972	423	50	292	27	208	58	66
Arrive On Green	0.16	0.37	0.37	0.22	0.37	0.37	0.18	0.18	0.18	0.18	0.18	0.18
Sat Flow, veh/h	1767	3547	59	1767	3526	1535	49	1616	151	821	320	367
Grp Volume(v), veh/h	112	298	311	55	898	216	48	0	0	226	0	0
Grp Sat Flow(s), veh/h/ln	1767	1763	1843	1767	1763	1535	1816	0	0	1508	0	0
Q Serve(g_s), s	5.8	15.2	15.2	2.4	23.2	10.4	0.0	0.0	0.0	11.5	0.0	0.0
Cycle Q Clear(g_c), s	5.8	15.2	15.2	2.4	23.2	10.4	2.1	0.0	0.0	13.6	0.0	0.0
Prop In Lane	1.00		0.03	1.00		1.00	0.08		0.08	0.57		0.24
Lane Grp Cap(c), veh/h	138	328	343	296	972	423	370	0	0	333	0	0
V/C Ratio(X)	0.81	0.91	0.91	0.19	0.92	0.51	0.13	0.00	0.00	0.68	0.00	0.00
Avail Cap(c_a), veh/h	162	737	770	296	1473	641	633	0	0	552	0	0
HCM Platoon Ratio	2.00	2.00	2.00	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.88	0.88	0.88	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	39.4	29.0	29.0	31.7	29.1	25.1	32.7	0.0	0.0	37.2	0.0	0.0
Incr Delay (d2), s/veh	19.8	3.9	3.8	0.1	14.1	3.8	0.1	0.0	0.0	0.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	5.1	5.4	1.0	10.2	3.8	0.9	0.0	0.0	5.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.2	32.9	32.8	31.8	43.2	28.9	32.8	0.0	0.0	38.2	0.0	0.0
LnGrp LOS	E	C	C	C	D	C	C	A	A	D	A	A
Approach Vol, veh/h	721			1169			48			226		
Approach Delay, s/veh	37.0			40.0			32.8			38.2		
Approach LOS	D			D			C			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	12.0	23.0		21.8	12.7	31.5		21.8				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		4.6				
Max Green Setting (Gmax), s	39.7	39.7		31.4	8.7	39.7		31.4				
Max Q Clear Time (g_c+14.4), s	17.2	17.2		15.6	7.8	25.2		4.1				
Green Ext Time (p_c), s	0.0	0.5		0.3	0.0	1.0		0.0				

Intersection Summary

HCM 6th Ctrl Delay 38.7

HCM 6th LOS D

Notes









User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

7: N Dutton Ave/Westberry Dr & Guerneville Rd

Lance Drive Residential TIA
Existing Plus Project PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	670	119	440	915	17	191	4	429	6	4	4
Future Volume (veh/h)	3	670	119	440	915	17	191	4	429	6	4	4
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	3	720	122	473	984	17	208	0	123	6	4	0
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	8	773	131	1518	2464	43	212	0	790	26	17	0
Arrive On Green	0.00	0.26	0.26	0.44	0.70	0.70	0.06	0.00	0.06	0.02	0.02	0.00
Sat Flow, veh/h	1767	3004	509	3428	3544	61	3534	0	1557	1081	721	0
Grp Volume(v), veh/h	3	422	420	473	489	512	208	0	123	10	0	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1750	1714	1763	1843	1767	0	1557	1801	0	0
Q Serve(g_s), s	0.2	22.2	22.3	8.5	11.1	11.1	5.6	0.0	0.0	0.5	0.0	0.0
Cycle Q Clear(g_c), s	0.2	22.2	22.3	8.5	11.1	11.1	5.6	0.0	0.0	0.5	0.0	0.0
Prop In Lane	1.00		0.29	1.00		0.03	1.00		1.00	0.60		0.00
Lane Grp Cap(c), veh/h	8	453	450	1518	1226	1281	212	0	790	44	0	0
V/C Ratio(X)	0.35	0.93	0.93	0.31	0.40	0.40	0.98	0.00	0.16	0.23	0.00	0.00
Avail Cap(c_a), veh/h	112	471	468	1518	1226	1281	212	0	790	525	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.97	0.97	0.97	0.66	0.66	0.66	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	47.1	34.5	34.5	17.1	6.1	6.1	44.6	0.0	12.7	45.5	0.0	0.0
Incr Delay (d2), s/veh	8.7	27.6	27.9	0.0	0.6	0.6	56.0	0.0	0.0	1.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	12.5	12.5	3.1	3.4	3.6	4.0	0.0	1.3	0.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.8	62.0	62.3	17.1	6.8	6.7	100.6	0.0	12.8	46.5	0.0	0.0
LnGrp LOS	E	E	E	B	A	A	F	A	B	D	A	A
Approach Vol, veh/h	845		1474				331		10			
Approach Delay, s/veh	62.2		10.1				67.9		46.5			
Approach LOS	E		B				E		D			
Timer - Assigned Phs	1	2	4		5	6	8					
Phs Duration (G+Y+Rc), s	47.4	29.7	6.9		5.8	71.3	11.0					
Change Period (Y+Rc), s	5.3	5.3	4.6		5.3	5.3	5.3					
Max Green Setting (Gmax), s	45.8	25.4	27.7		6.0	35.1	5.7					
Max Q Clear Time (g_c+I10), s	10.5	24.3	2.5		2.2	13.1	7.6					
Green Ext Time (p_c), s	0.1	0.2	0.0		0.0	0.8	0.0					
Intersection Summary												
HCM 6th Ctrl Delay	34.0											
HCM 6th LOS	C											

HCM 6th Signalized Intersection Summary

8: Herbert St/Coffey Ln & Guerneville Rd

Lance Drive Residential TIA
Existing Plus Project PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	163	880	52	48	1143	88	37	20	28	97	23	217
Future Volume (veh/h)	163	880	52	48	1143	88	37	20	28	97	23	217
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.99	1.00		0.93	1.00		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	177	957	54	52	1242	91	40	22	14	105	25	69
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	149	1011	57	570	1788	131	80	44	28	167	40	305
Arrive On Green	0.08	0.30	0.30	0.32	0.54	0.54	0.09	0.09	0.09	0.12	0.12	0.12
Sat Flow, veh/h	1767	3383	191	1767	3329	243	908	499	318	1441	343	1484
Grp Volume(v), veh/h	177	499	512	52	657	676	76	0	0	130	0	69
Grp Sat Flow(s), veh/h/ln	1767	1763	1812	1767	1763	1809	1725	0	0	1784	0	1484
Q Serve(g_s), s	9.7	31.8	31.8	2.4	31.6	31.8	4.8	0.0	0.0	8.0	0.0	4.5
Cycle Q Clear(g_c), s	9.7	31.8	31.8	2.4	31.6	31.8	4.8	0.0	0.0	8.0	0.0	4.5
Prop In Lane	1.00		0.11	1.00		0.13	0.53		0.18	0.81		1.00
Lane Grp Cap(c), veh/h	149	527	541	570	947	972	152	0	0	207	0	305
V/C Ratio(X)	1.19	0.95	0.95	0.09	0.69	0.70	0.50	0.00	0.00	0.63	0.00	0.23
Avail Cap(c_a), veh/h	149	581	597	570	947	972	375	0	0	403	0	468
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.84	0.84	0.84	0.81	0.81	0.81	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	52.7	39.4	39.4	27.2	19.6	19.7	50.0	0.0	0.0	48.5	0.0	38.6
Incr Delay (d2), s/veh	127.0	24.9	24.5	0.0	3.4	3.4	1.0	0.0	0.0	1.2	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.5	16.9	17.3	1.0	12.9	13.3	2.1	0.0	0.0	3.6	0.0	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	179.7	64.4	63.9	27.2	23.0	23.0	51.0	0.0	0.0	49.7	0.0	38.7
LnGrp LOS	F	E	E	C	C	C	D	A	A	D	A	D
Approach Vol, veh/h	1188			1385			76			199		
Approach Delay, s/veh	81.3			23.2			51.0			45.9		
Approach LOS	F			C			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	42.4	39.7		18.2	15.0	67.1		14.7				
Change Period (Y+Rc), s	5.3	5.3		4.9	5.3	5.3		4.6				
Max Green Setting (Gmax), s	60.0	37.9		26.0	9.7	34.2		25.0				
Max Q Clear Time (g_c+14.4), s	14.4	33.8		10.0	11.7	33.8		6.8				
Green Ext Time (p_c), s	0.0	0.6		0.1	0.0	0.1		0.1				
Intersection Summary												
HCM 6th Ctrl Delay	49.8											
HCM 6th LOS	D											

HCM 6th Signalized Intersection Summary

9: Range Ave & Guerneville Rd

Lance Drive Residential TIA
Existing Plus Project PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	145	638	198	81	800	16	271	151	134	83	217	235
Future Volume (veh/h)	145	638	198	81	800	16	271	151	134	83	217	235
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.93
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No		No				No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	151	665	0	84	833	0	174	308	83	86	226	84
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	490	1703		107	939		295	469	124	130	183	65
Arrive On Green	0.28	0.48	0.00	0.06	0.27	0.00	0.17	0.17	0.17	0.02	0.02	0.02
Sat Flow, veh/h	1767	3618	0	1767	3618	0	1767	2812	743	1767	2490	886
Grp Volume(v), veh/h	151	665	0	84	833	0	174	201	190	86	157	153
Grp Sat Flow(s),veh/h/ln	1767	1763	0	1767	1763	0	1767	1856	1699	1767	1763	1613
Q Serve(g_s), s	6.4	11.4	0.0	4.5	21.6	0.0	8.6	9.6	10.0	4.6	7.0	7.0
Cycle Q Clear(g_c), s	6.4	11.4	0.0	4.5	21.6	0.0	8.6	9.6	10.0	4.6	7.0	7.0
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.44	1.00		0.55
Lane Grp Cap(c), veh/h	490	1703		107	939		295	310	284	130	130	119
V/C Ratio(X)	0.31	0.39		0.79	0.89		0.59	0.65	0.67	0.66	1.21	1.29
Avail Cap(c_a), veh/h	490	1703		112	1058		614	645	590	130	130	119
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	0.79	0.79	0.00	0.92	0.92	0.00	1.00	1.00	1.00	0.62	0.62	0.62
Uniform Delay (d), s/veh	27.1	15.6	0.0	44.0	33.5	0.0	36.6	37.0	37.1	45.2	46.3	46.3
Incr Delay (d2), s/veh	0.1	0.5	0.0	24.6	7.4	0.0	0.7	0.9	1.0	6.0	130.0	162.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	4.4	0.0	2.6	9.8	0.0	3.7	4.4	4.2	2.2	7.8	8.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.2	16.2	0.0	68.6	40.9	0.0	37.3	37.8	38.1	51.2	176.3	208.9
LnGrp LOS	C	B		E	D		D	D	D	D	F	F
Approach Vol, veh/h	816		A		917		A		565		396	
Approach Delay, s/veh	18.2				43.4				37.8		161.7	
Approach LOS	B				D				D		F	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.1	51.2		12.3	31.6	30.6		20.5				
Change Period (Y+Rc), s	5.3	5.3		5.3	5.3	5.3		4.6				
Max Green Setting (Gmax), s	6.0	28.5		7.0	6.0	28.5		33.0				
Max Q Clear Time (g_c+10), s	16.5	13.4		9.0	8.4	23.6		12.0				
Green Ext Time (p_c), s	0.0	0.8		0.0	0.0	0.7		0.3				

Intersection Summary

HCM 6th Ctrl Delay	52.0
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

10: Guerneville Rd & Steele Wy

Lance Drive Residential TIA
Existing Plus Project PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	739	100	128	816	10	64	34	156	312	48	17
Future Volume (veh/h)	16	739	100	128	816	10	64	34	156	312	48	17
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	16	754	71	131	833	9	50	56	70	353	0	5
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	643	1939	981	218	892	10	145	152	226	455	0	769
Arrive On Green	0.36	0.55	0.55	0.06	0.25	0.25	0.08	0.08	0.08	0.13	0.00	0.13
Sat Flow, veh/h	1767	3526	1550	3428	3572	39	1767	1856	1532	3534	0	1526
Grp Volume(v), veh/h	16	754	71	131	411	431	50	56	70	353	0	5
Grp Sat Flow(s), veh/h/ln	1767	1763	1550	1714	1763	1848	1767	1856	1532	1767	0	1526
Q Serve(g_s), s	0.6	13.5	1.9	4.1	25.1	25.1	2.9	3.1	4.5	10.6	0.0	0.0
Cycle Q Clear(g_c), s	0.6	13.5	1.9	4.1	25.1	25.1	2.9	3.1	4.5	10.6	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.02	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	643	1939	981	218	440	461	145	152	226	455	0	769
V/C Ratio(X)	0.02	0.39	0.07	0.60	0.93	0.93	0.34	0.37	0.31	0.78	0.00	0.01
Avail Cap(c_a), veh/h	643	1939	981	221	476	499	434	455	476	868	0	947
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.83	0.83	0.83	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	22.5	14.2	7.8	50.1	40.4	40.4	47.7	47.8	42.1	46.4	0.0	14.2
Incr Delay (d2), s/veh	0.0	0.5	0.1	3.0	24.0	23.2	0.5	0.5	0.3	1.1	0.0	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	5.2	0.8	1.8	13.6	14.1	1.3	1.5	1.7	4.7	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	22.5	14.7	7.9	53.2	64.3	63.6	48.2	48.3	42.3	47.5	0.0	14.2
LnGrp LOS	C	B	A	D	E	E	D	D	D	D	A	B
Approach Vol, veh/h	841			973			176			358		
Approach Delay, s/veh	14.2			62.5			45.9			47.0		
Approach LOS	B			E			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	1.9	65.4		19.1	44.9	32.4		13.6				
Change Period (Y+Rc), s	4.9	4.9		4.9	4.9	4.9		4.6				
Max Green Setting (Gmax), s	29.6			27.0	7.0	29.7		27.0				
Max Q Clear Time (g_c+10), s	15.5			12.6	2.6	27.1		6.5				
Green Ext Time (p_c), s	0.0	0.9		0.1	0.0	0.4		0.0				

Intersection Summary

HCM 6th Ctrl Delay 41.6

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.










User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

11: Cleveland Ave & Guerneville Rd

Lance Drive Residential TIA
Existing Plus Project PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	110	1049	74	302	1235	197	85	130	227	405	340	111
Future Volume (veh/h)	110	1049	74	302	1235	197	85	130	227	405	340	111
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.98	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No				No				No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	115	1093	68	315	1286	129	89	135	68	292	536	99
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	240	1490	93	385	1228	536	293	381	181	370	636	117
Arrive On Green	0.07	0.31	0.31	0.04	0.11	0.11	0.17	0.17	0.17	0.21	0.21	0.21
Sat Flow, veh/h	3428	4866	302	3428	3526	1538	1767	2301	1092	1767	3033	558
Grp Volume(v), veh/h	115	758	403	315	1286	129	89	101	102	292	327	308
Grp Sat Flow(s),veh/h/ln	1714	1689	1792	1714	1763	1538	1767	1763	1630	1767	1856	1735
Q Serve(g_s), s	3.1	19.1	19.1	8.7	33.1	7.3	4.2	4.8	5.3	14.9	16.1	16.2
Cycle Q Clear(g_c), s	3.1	19.1	19.1	8.7	33.1	7.3	4.2	4.8	5.3	14.9	16.1	16.2
Prop In Lane	1.00		0.17	1.00		1.00	1.00		0.67	1.00		0.32
Lane Grp Cap(c), veh/h	240	1034	549	385	1228	536	293	292	270	370	389	364
V/C Ratio(X)	0.48	0.73	0.73	0.82	1.05	0.24	0.30	0.35	0.38	0.79	0.84	0.85
Avail Cap(c_a), veh/h	253	1034	549	422	1228	536	293	292	270	502	527	493
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.49	0.49	0.49	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.5	29.5	29.5	44.8	42.0	30.6	34.8	35.1	35.3	35.5	36.0	36.1
Incr Delay (d2), s/veh	0.5	2.4	4.5	5.1	31.8	0.0	2.7	3.3	4.0	4.0	6.7	7.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	7.8	8.6	4.1	20.9	2.8	2.0	2.3	2.4	6.6	7.8	7.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.0	31.9	34.0	49.9	73.8	30.6	37.5	38.3	39.2	39.5	42.7	43.7
LnGrp LOS	D	C	C	D	F	C	D	D	D	D	D	D
Approach Vol, veh/h	1276					1730		292		927		
Approach Delay, s/veh	33.5					66.2		38.4		42.1		
Approach LOS	C					E		D		D		
Timer - Assigned Phs	1	2	4		5	6	8					
Phs Duration (G+Y+Rc), s	5.6	34.0	20.6		11.6	38.0	24.8					
Change Period (Y+Rc), s	4.9	4.9	4.9		4.9	4.9	4.9					
Max Green Setting (Gmax), s	1.3	28.4	8.3		7.0	33.1	27.0					
Max Q Clear Time (g_c+110), s	1.3	21.1	7.3		5.1	35.1	18.2					
Green Ext Time (p_c), s	0.0	1.2	0.0		0.0	0.0	0.5					

Intersection Summary

HCM 6th Ctrl Delay	49.1
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.
User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 12: US 101 SB Ramps & Guerneville Rd

Lance Drive Residential TIA
Existing Plus Project PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑					↑	↑	↑
Traffic Volume (veh/h)	0	1152	555	291	1385	0	0	0	0	289	63	363
Future Volume (veh/h)	0	1152	555	291	1385	0	0	0	0	289	63	363
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1856	1856	1856	1856	0				1856	1856	1856
Adj Flow Rate, veh/h	0	1188	247	300	1428	0				344	0	335
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	1381	413	367	1520	0				1657	0	737
Arrive On Green	0.00	0.27	0.27	0.11	0.43	0.00				0.47	0.00	0.47
Sat Flow, veh/h	0	5233	1513	3428	3618	0				3534	0	1572
Grp Volume(v), veh/h	0	1188	247	300	1428	0				344	0	335
Grp Sat Flow(s),veh/h/ln	0	1689	1513	1714	1763	0				1767	0	1572
Q Serve(g_s), s	0.0	21.2	13.5	8.1	36.8	0.0				5.4	0.0	13.7
Cycle Q Clear(g_c), s	0.0	21.2	13.5	8.1	36.8	0.0				5.4	0.0	13.7
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1381	413	367	1520	0				1657	0	737
V/C Ratio(X)	0.00	0.86	0.60	0.82	0.94	0.00				0.21	0.00	0.45
Avail Cap(c_a), veh/h	0	1925	575	516	2052	0				1657	0	737
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.54	0.54	0.71	0.71	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	32.8	30.0	41.5	25.8	0.0				14.8	0.0	17.0
Incr Delay (d2), s/veh	0.0	1.3	0.3	3.5	4.9	0.0				0.3	0.0	2.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	8.5	4.8	3.5	15.3	0.0				2.1	0.0	4.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	34.1	30.3	45.0	30.7	0.0				15.1	0.0	19.1
LnGrp LOS	A	C	C	D	C	A				B	A	B
Approach Vol, veh/h		1435			1728						679	
Approach Delay, s/veh		33.4			33.2						17.1	
Approach LOS		C			C						B	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	5.1	30.8		49.1		45.9						
Change Period (Y+Rc), s	4.9	4.9		4.6		4.9						
Max Green Setting (Gmax), s	4.3	36.1		30.2		55.3						
Max Q Clear Time (g_c+I10), s	11.0	23.2		15.7		38.8						
Green Ext Time (p_c), s	0.0	1.7		0.1		2.2						

Intersection Summary

HCM 6th Ctrl Delay	30.4
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 13: US 101 NB Ramps & Guerneville Rd/Steele Ln

Lance Drive Residential TIA
Existing Plus Project PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↱↱			↱↱↱		↰	↰↱	↱			
Traffic Volume (veh/h)	417	1024	0	0	996	232	680	1	329	0	0	0
Future Volume (veh/h)	417	1024	0	0	996	232	680	1	329	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1856	1856	0	0	1856	1856	1856	1856	1856			
Adj Flow Rate, veh/h	434	1067	0	0	1038	214	781	0	156			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	3	3	0	0	3	3	3	3	3			
Cap, veh/h	1149	2333	0	0	1153	237	842	0	375			
Arrive On Green	0.67	1.00	0.00	0.00	0.28	0.28	0.24	0.00	0.24			
Sat Flow, veh/h	3428	3618	0	0	4358	863	3534	0	1572			
Grp Volume(v), veh/h	434	1067	0	0	836	416	781	0	156			
Grp Sat Flow(s),veh/h/ln	1714	1763	0	0	1689	1676	1767	0	1572			
Q Serve(g_s), s	5.3	0.0	0.0	0.0	22.7	22.7	20.5	0.0	8.0			
Cycle Q Clear(g_c), s	5.3	0.0	0.0	0.0	22.7	22.7	20.5	0.0	8.0			
Prop In Lane	1.00		0.00	0.00		0.51	1.00		1.00			
Lane Grp Cap(c), veh/h	1149	2333	0	0	929	461	842	0	375			
V/C Ratio(X)	0.38	0.46	0.00	0.00	0.90	0.90	0.93	0.00	0.42			
Avail Cap(c_a), veh/h	1149	2333	0	0	1177	584	1168	0	520			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.61	0.61	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	11.3	0.0	0.0	0.0	33.2	33.2	35.4	0.0	30.6			
Incr Delay (d2), s/veh	0.0	0.4	0.0	0.0	7.1	13.0	8.5	0.0	0.3			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	1.7	0.1	0.0	0.0	9.8	10.5	9.3	0.0	2.9			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.3	0.4	0.0	0.0	40.2	46.2	43.8	0.0	30.9			
LnGrp LOS	B	A	A	A	D	D	D	A	C			
Approach Vol, veh/h	1501			1252			937					
Approach Delay, s/veh	3.6			42.2			41.7					
Approach LOS	A			D			D					
Timer - Assigned Phs	2			5			6			8		
Phs Duration (G+Y+Rc), s	67.8			36.7			31.0			27.2		
Change Period (Y+Rc), s	4.9			4.9			4.9			4.6		
Max Green Setting (Gmax), s	54.1			16.1			33.1			31.4		
Max Q Clear Time (g_c+I1), s	2.0			7.3			24.7			22.5		
Green Ext Time (p_c), s	1.5			0.1			1.4			0.1		

Intersection Summary

HCM 6th Ctrl Delay	26.4
HCM 6th LOS	C

Notes










User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

14: Stony Point Rd/Marlow Rd & W College Ave

Lance Drive Residential TIA
Existing Plus Project PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	76	236	104	215	331	191	153	758	254	152	815	108
Future Volume (veh/h)	76	236	104	215	331	191	153	758	254	152	815	108
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	80	248	66	226	348	133	161	798	134	160	858	105
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	378	364	95	492	491	184	173	892	828	200	847	104
Arrive On Green	0.21	0.13	0.13	0.28	0.20	0.20	0.10	0.25	0.25	0.11	0.27	0.27
Sat Flow, veh/h	1767	2756	716	1767	2495	936	1767	3526	1544	1767	3155	386
Grp Volume(v), veh/h	80	157	157	226	244	237	161	798	134	160	479	484
Grp Sat Flow(s),veh/h/ln	1767	1763	1710	1767	1763	1669	1767	1763	1544	1767	1763	1778
Q Serve(g_s), s	3.5	8.0	8.4	10.1	12.3	12.6	8.6	20.8	1.7	8.4	25.5	25.5
Cycle Q Clear(g_c), s	3.5	8.0	8.4	10.1	12.3	12.6	8.6	20.8	1.7	8.4	25.5	25.5
Prop In Lane	1.00		0.42	1.00		0.56	1.00		1.00	1.00		0.22
Lane Grp Cap(c), veh/h	378	233	226	492	347	328	173	892	828	200	473	477
V/C Ratio(X)	0.21	0.67	0.70	0.46	0.70	0.72	0.93	0.89	0.16	0.80	1.01	1.01
Avail Cap(c_a), veh/h	378	482	468	492	542	513	173	931	845	200	473	477
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.45	0.45	0.45	1.00	1.00	1.00	0.45	0.45	0.45
Uniform Delay (d), s/veh	30.7	39.3	39.4	28.4	35.6	35.7	42.5	34.3	3.3	41.1	34.7	34.8
Incr Delay (d2), s/veh	0.3	3.3	3.8	0.3	1.2	1.4	48.6	10.8	0.1	9.9	31.1	31.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	3.6	3.6	4.1	5.2	5.1	6.0	9.8	0.6	4.1	14.4	14.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.0	42.6	43.2	28.7	36.8	37.1	91.2	45.1	3.4	50.9	65.8	65.7
LnGrp LOS	C	D	D	C	D	D	F	D	A	D	F	F
Approach Vol, veh/h	394			707			1093			1123		
Approach Delay, s/veh	40.5			34.3			46.8			63.6		
Approach LOS	D			C			D			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	17.9	17.9	14.6	30.8	25.6	24.0	16.1	29.3				
Change Period (Y+Rc), s	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3				
Max Green Setting (Gmax), s	26.0	26.0	9.3	25.5	9.8	29.2	9.7	25.1				
Max Q Clear Time (g_c+I1), s	10.4	10.4	10.6	27.5	5.5	14.6	10.4	22.8				
Green Ext Time (p_c), s	0.1	1.5	0.0	0.0	0.1	2.3	0.0	1.3				

Intersection Summary

HCM 6th Ctrl Delay 49.1

HCM 6th LOS D

Notes









User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

15: N Dutton Ave & W College Ave

Lance Drive Residential TIA
Existing Plus Project PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	76	558	96	180	747	179	134	340	124	303	499	132
Future Volume (veh/h)	76	558	96	180	747	179	134	340	124	303	499	132
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	79	581	88	188	778	168	140	354	95	316	520	118
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	101	653	99	225	842	182	464	445	118	606	689	156
Arrive On Green	0.06	0.21	0.21	0.13	0.29	0.29	0.26	0.16	0.16	0.34	0.24	0.24
Sat Flow, veh/h	1767	3063	463	1767	2874	621	1767	2744	725	1767	2845	642
Grp Volume(v), veh/h	79	334	335	188	477	469	140	225	224	316	321	317
Grp Sat Flow(s),veh/h/ln	1767	1763	1763	1767	1763	1732	1767	1763	1707	1767	1763	1725
Q Serve(g_s), s	4.2	17.5	17.6	9.9	24.9	24.9	6.0	11.7	12.0	13.6	16.0	16.2
Cycle Q Clear(g_c), s	4.2	17.5	17.6	9.9	24.9	24.9	6.0	11.7	12.0	13.6	16.0	16.2
Prop In Lane	1.00		0.26	1.00		0.36	1.00		0.43	1.00		0.37
Lane Grp Cap(c), veh/h	101	376	376	225	516	507	464	286	277	606	427	418
V/C Ratio(X)	0.78	0.89	0.89	0.84	0.92	0.92	0.30	0.79	0.81	0.52	0.75	0.76
Avail Cap(c_a), veh/h	130	429	429	260	559	549	464	408	395	606	501	490
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.82	0.82	0.82	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.2	36.3	36.3	40.5	32.6	32.6	28.1	38.2	38.4	25.0	33.4	33.4
Incr Delay (d2), s/veh	12.9	14.4	14.9	16.3	19.7	20.0	0.1	4.0	5.2	0.4	4.2	4.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	8.8	8.9	5.2	13.0	12.8	2.5	5.2	5.3	5.4	7.0	7.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.1	50.6	51.2	56.8	52.3	52.6	28.2	42.2	43.6	25.4	37.5	38.0
LnGrp LOS	E	D	D	E	D	D	C	D	D	C	D	D
Approach Vol, veh/h	748			1134			589			954		
Approach Delay, s/veh	51.6			53.1			39.4			33.6		
Approach LOS	D			D			D			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.0	24.2	27.9	26.9	8.4	31.7	35.6	19.3				
Change Period (Y+Rc), s	3.9	* 3.9	3.0	3.9	3.0	3.9	3.0	3.9				
Max Green Setting (Gmax), s	4.0	* 23	17.1	27.0	7.0	30.1	22.1	22.0				
Max Q Clear Time (g_c+I1), s	11.9	19.6	8.0	18.2	6.2	26.9	15.6	14.0				
Green Ext Time (p_c), s	0.0	0.6	0.0	0.9	0.0	0.9	0.1	0.6				

Intersection Summary

HCM 6th Ctrl Delay 45.0





HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection												
Intersection Delay, s/veh	8.7											
Intersection LOS	A											




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	50	0	62	78	92	0	6	36	76	7	13
Future Vol, veh/h	7	50	0	62	78	92	0	6	36	76	7	13
Peak Hour Factor	0.86	0.86	0.92	0.92	0.86	0.86	0.92	0.92	0.92	0.86	0.92	0.86
Heavy Vehicles, %	3	3	2	2	3	3	2	2	2	3	2	3
Mvmt Flow	8	58	0	67	91	107	0	7	39	88	8	15
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.1	9.1	7.6	8.7
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	12%	27%	79%
Vol Thru, %	14%	88%	34%	7%
Vol Right, %	86%	0%	40%	14%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	42	57	232	96
LT Vol	0	7	62	76
Through Vol	6	50	78	7
RT Vol	36	0	92	13
Lane Flow Rate	46	66	265	111
Geometry Grp	1	1	1	1
Degree of Util (X)	0.054	0.085	0.309	0.149
Departure Headway (Hd)	4.294	4.631	4.202	4.814
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	834	774	856	745
Service Time	2.323	2.655	2.22	2.839
HCM Lane V/C Ratio	0.055	0.085	0.31	0.149
HCM Control Delay	7.6	8.1	9.1	8.7
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.2	0.3	1.3	0.5




HCM 6th TWSC
17: Iroquois St & Project Driveway (1)

Lance Drive Residential TIA
Existing Plus Project PM (95-120 Seconds)

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	5	8	90	87	3
Future Vol, veh/h	1	5	8	90	87	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	5	9	98	95	3
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	213	97	98	0	-	0
Stage 1	97	-	-	-	-	-
Stage 2	116	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	775	959	1495	-	-	-
Stage 1	927	-	-	-	-	-
Stage 2	909	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	770	959	1495	-	-	-
Mov Cap-2 Maneuver	770	-	-	-	-	-
Stage 1	921	-	-	-	-	-
Stage 2	909	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	8.9	0.6		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1495	-	921	-	-	
HCM Lane V/C Ratio	0.006	-	0.007	-	-	
HCM Control Delay (s)	7.4	0	8.9	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	




HCM 6th TWSC
18: Iroquois St & Project Driveway (2)

Lance Drive Residential TIA
Existing Plus Project PM (95-120 Seconds)

Intersection						
Int Delay, s/veh	0.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	6	9	96	90	2
Future Vol, veh/h	2	6	9	96	90	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	7	10	104	98	2
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	223	99	100	0	-	0
Stage 1	99	-	-	-	-	-
Stage 2	124	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	765	957	1493	-	-	-
Stage 1	925	-	-	-	-	-
Stage 2	902	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	760	957	1493	-	-	-
Mov Cap-2 Maneuver	760	-	-	-	-	-
Stage 1	919	-	-	-	-	-
Stage 2	902	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	9	0.6		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1493	-	899	-	-	
HCM Lane V/C Ratio	0.007	-	0.01	-	-	
HCM Control Delay (s)	7.4	0	9	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	

HCM 6th TWSC
19: Project Driveway (3) & Lance Dr

Lance Drive Residential TIA
Existing Plus Project PM (95-120 Seconds)

Intersection						
Int Delay, s/veh	1.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	159	3	43	229	3	27
Future Vol, veh/h	159	3	43	229	3	27
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	173	3	47	249	3	29
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	176	0	518	175
Stage 1	-	-	-	-	175	-
Stage 2	-	-	-	-	343	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1400	-	518	868
Stage 1	-	-	-	-	855	-
Stage 2	-	-	-	-	719	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1400	-	498	868
Mov Cap-2 Maneuver	-	-	-	-	498	-
Stage 1	-	-	-	-	855	-
Stage 2	-	-	-	-	691	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	1.2		9.6		
HCM LOS	A					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	808	-	-	1400	-	
HCM Lane V/C Ratio	0.04	-	-	0.033	-	
HCM Control Delay (s)	9.6	-	-	7.7	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0.1	-	-	0.1	-	

HCM 6th TWSC
20: Guerneville Rd & Project Driveway (4)























Lance Drive Residential TIA
Existing Plus Project PM (95-120 Seconds)

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕↕	↕↕		↕	
Traffic Vol, veh/h	9	681	910	20	13	5
Future Vol, veh/h	9	681	910	20	13	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	740	989	22	14	5
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	1011	0	-	0	1390	506
Stage 1	-	-	-	-	1000	-
Stage 2	-	-	-	-	390	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	681	-	-	-	133	512
Stage 1	-	-	-	-	317	-
Stage 2	-	-	-	-	653	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	681	-	-	-	130	512
Mov Cap-2 Maneuver	-	-	-	-	130	-
Stage 1	-	-	-	-	309	-
Stage 2	-	-	-	-	653	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.2	0		29.9		
HCM LOS				D		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	681	-	-	-	164	
HCM Lane V/C Ratio	0.014	-	-	-	0.119	
HCM Control Delay (s)	10.4	0.1	-	-	29.9	
HCM Lane LOS	B	A	-	-	D	
HCM 95th %tile Q(veh)	0	-	-	-	0.4	

HCM 6th Signalized Intersection Summary







1: Marlow Rd & Marlow Ct/W Steele Ln

Lance Drive Residential TIA
Existing Plus Project PM (120 Seconds)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	0	2	163	4	142	5	624	161	117	708	2
Future Volume (veh/h)	2	0	2	163	4	142	5	624	161	117	708	2
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.96	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	2	0	0	175	0	91	5	657	116	123	745	2
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	25	0	0	1826	0	945	11	794	1154	152	1099	3
Arrive On Green	0.01	0.00	0.00	0.52	0.00	0.52	0.01	0.23	0.23	0.09	0.30	0.30
Sat Flow, veh/h	1767	0	0	3534	0	1568	1767	3526	1516	1767	3607	10
Grp Volume(v), veh/h	2	0	0	175	0	91	5	657	116	123	364	383
Grp Sat Flow(s),veh/h/ln	1767	0	0	1767	0	1568	1767	1763	1516	1767	1763	1854
Q Serve(g_s), s	0.1	0.0	0.0	3.0	0.0	0.0	0.3	21.3	2.6	8.2	21.7	21.7
Cycle Q Clear(g_c), s	0.1	0.0	0.0	3.0	0.0	0.0	0.3	21.3	2.6	8.2	21.7	21.7
Prop In Lane	1.00		0.00	1.00		1.00	1.00		1.00	1.00		0.01
Lane Grp Cap(c), veh/h	25	0	0	1826	0	945	11	794	1154	152	537	565
V/C Ratio(X)	0.08	0.00	0.00	0.10	0.00	0.10	0.44	0.83	0.10	0.81	0.68	0.68
Avail Cap(c_a), veh/h	227	0	0	1826	0	945	149	1031	1256	517	883	928
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.66	0.66	0.66	1.00	1.00	1.00
Uniform Delay (d), s/veh	58.4	0.0	0.0	14.8	0.0	10.1	59.4	44.3	4.3	53.9	36.5	36.5
Incr Delay (d2), s/veh	1.4	0.0	0.0	0.1	0.0	0.2	16.9	3.0	0.0	9.7	1.5	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.0	1.2	0.0	1.0	0.2	9.5	2.9	4.0	9.4	9.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.8	0.0	0.0	14.9	0.0	10.3	76.3	47.3	4.4	63.5	38.0	38.0
LnGrp LOS	E	A	A	B	A	B	E	D	A	E	D	D
Approach Vol, veh/h	2			266				778				870
Approach Delay, s/veh	59.8			13.3				41.1				41.6
Approach LOS	E			B				D				D
Timer - Assigned Phs	2		3	4		6		7	8			
Phs Duration (G+Y+Rc), s	66.6		5.7	41.5		6.3		15.2	31.9			
Change Period (Y+Rc), s	4.6		4.9	4.9		4.6		4.9	4.9			
Max Green Setting (Gmax), s	15.4		10.1	60.1		15.4		35.1	35.1			
Max Q Clear Time (g_c+I1), s	5.0		2.3	23.7		2.1		10.2	23.3			
Green Ext Time (p_c), s	0.6		0.0	5.0		0.0		0.3	3.7			
Intersection Summary												
HCM 6th Ctrl Delay	37.5											
HCM 6th LOS	D											
Notes												
User approved pedestrian interval to be less than phase max green.												
User approved volume balancing among the lanes for turning movement.												






















HCM 6th TWSC
2: Iroquois St/Apple Valley Ln & W Steele Ln

Lance Drive Residential TIA
Existing Plus Project PM (120 Seconds)

Intersection												
Int Delay, s/veh	3.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	24	278	50	50	438	37	47	4	27	22	9	23
Future Vol, veh/h	24	278	50	50	438	37	47	4	27	22	9	23
Conflicting Peds, #/hr	9	0	9	9	0	9	1	0	2	2	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	60	-	-	80	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	25	293	53	53	461	39	49	4	28	23	9	24
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	509	0	0	355	0	0	983	994	331	984	1001	491
Stage 1	-	-	-	-	-	-	379	379	-	596	596	-
Stage 2	-	-	-	-	-	-	604	615	-	388	405	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1051	-	-	1198	-	-	227	244	708	227	242	575
Stage 1	-	-	-	-	-	-	641	613	-	488	490	-
Stage 2	-	-	-	-	-	-	484	481	-	634	597	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1042	-	-	1188	-	-	197	223	701	202	221	570
Mov Cap-2 Maneuver	-	-	-	-	-	-	197	223	-	202	221	-
Stage 1	-	-	-	-	-	-	620	593	-	472	464	-
Stage 2	-	-	-	-	-	-	433	455	-	588	577	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.6			0.8			24.7			20.8		
HCM LOS							C			C		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	264	1042	-	-	1188	-	-	284				
HCM Lane V/C Ratio	0.311	0.024	-	-	0.044	-	-	0.2				
HCM Control Delay (s)	24.7	8.5	-	-	8.2	-	-	20.8				
HCM Lane LOS	C	A	-	-	A	-	-	C				
HCM 95th %tile Q(veh)	1.3	0.1	-	-	0.1	-	-	0.7				

HCM 6th Signalized Intersection Summary 3: Range Ave & W Steele Ln

Lance Drive Residential TIA
Existing Plus Project PM (120 Seconds)











												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	308	61	56	418	44	81	191	40	58	418	48
Future Volume (veh/h)	35	308	61	56	418	44	81	191	40	58	418	48
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.96	1.00		0.92
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	36	321	57	58	435	42	84	199	24	60	435	39
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	595	1065	189	673	1159	112	106	413	49	138	508	45
Arrive On Green	0.70	0.70	0.70	0.70	0.70	0.70	0.06	0.13	0.13	0.08	0.16	0.16
Sat Flow, veh/h	909	1529	272	995	1665	161	1767	3157	375	1767	3247	289
Grp Volume(v), veh/h	36	0	378	58	0	477	84	110	113	60	235	239
Grp Sat Flow(s),veh/h/ln	909	0	1801	995	0	1826	1767	1763	1769	1767	1763	1773
Q Serve(g_s), s	2.0	0.0	9.7	2.9	0.0	12.9	5.6	6.9	7.1	3.9	15.6	15.8
Cycle Q Clear(g_c), s	14.9	0.0	9.7	12.5	0.0	12.9	5.6	6.9	7.1	3.9	15.6	15.8
Prop In Lane	1.00		0.15	1.00		0.09	1.00		0.21	1.00		0.16
Lane Grp Cap(c), veh/h	595	0	1254	673	0	1271	106	230	231	138	276	277
V/C Ratio(X)	0.06	0.00	0.30	0.09	0.00	0.38	0.79	0.48	0.49	0.44	0.85	0.86
Avail Cap(c_a), veh/h	595	0	1254	673	0	1271	236	560	562	162	486	489
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.57	0.57	0.57	1.00	1.00	1.00
Uniform Delay (d), s/veh	10.6	0.0	7.0	9.4	0.0	7.5	55.7	48.4	48.4	52.8	49.3	49.4
Incr Delay (d2), s/veh	0.2	0.0	0.6	0.3	0.0	0.8	2.9	0.3	0.3	0.8	2.9	3.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	3.6	0.6	0.0	4.8	2.6	3.0	3.1	1.7	6.9	7.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.8	0.0	7.6	9.7	0.0	8.3	58.6	48.7	48.8	53.6	52.2	52.5
LnGrp LOS	B	A	A	A	A	A	E	D	D	D	D	D
Approach Vol, veh/h		414			535			307			534	
Approach Delay, s/veh		7.9			8.5			51.4			52.5	
Approach LOS		A			A			D			D	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		87.2	10.2	22.7		87.2	13.3	19.6				
Change Period (Y+Rc), s		3.6	3.0	3.9		3.6	3.9	* 3.9				
Max Green Setting (Gmax), s		60.4	16.0	33.1		60.4	11.0	* 38				
Max Q Clear Time (g_c+I1), s		16.9	7.6	17.8		14.9	5.9	9.1				
Green Ext Time (p_c), s		0.8	0.0	0.8		1.1	0.0	0.4				
Intersection Summary												
HCM 6th Ctrl Delay			28.8									
HCM 6th LOS			C									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

HCM 6th Signalized Intersection Summary

4: Marlow Rd & Guerneville Rd

Lance Drive Residential TIA
Existing Plus Project PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	166	420	117	274	461	110	130	599	186	65	700	67
Future Volume (veh/h)	166	420	117	274	461	110	130	599	186	65	700	67
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	175	442	66	288	485	96	137	631	116	68	737	65
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	204	587	401	315	682	134	164	769	616	228	832	73
Arrive On Green	0.12	0.17	0.17	0.18	0.23	0.23	0.09	0.22	0.22	0.04	0.08	0.08
Sat Flow, veh/h	1767	3526	1535	1767	2924	575	1767	3526	1537	1767	3271	288
Grp Volume(v), veh/h	175	442	66	288	291	290	137	631	116	68	397	405
Grp Sat Flow(s),veh/h/ln	1767	1763	1535	1767	1763	1736	1767	1763	1537	1767	1763	1797
Q Serve(g_s), s	11.7	14.3	1.6	19.2	18.2	18.4	9.2	20.5	0.0	4.5	26.7	26.8
Cycle Q Clear(g_c), s	11.7	14.3	1.6	19.2	18.2	18.4	9.2	20.5	0.0	4.5	26.7	26.8
Prop In Lane	1.00		1.00	1.00		0.33	1.00		1.00	1.00		0.16
Lane Grp Cap(c), veh/h	204	587	401	315	411	405	164	769	616	228	449	457
V/C Ratio(X)	0.86	0.75	0.16	0.91	0.71	0.72	0.84	0.82	0.19	0.30	0.89	0.89
Avail Cap(c_a), veh/h	284	831	508	349	480	473	202	1064	744	228	480	490
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	0.97	0.97	0.97	0.58	0.58	0.58	0.84	0.84	0.84
Uniform Delay (d), s/veh	52.1	47.6	8.8	48.4	42.3	42.4	53.6	44.7	23.6	52.2	53.2	53.2
Incr Delay (d2), s/veh	16.9	2.4	0.2	25.6	9.6	10.1	13.8	2.2	0.1	0.6	14.7	14.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.0	6.4	1.0	10.5	8.8	8.9	4.6	9.0	2.1	2.1	14.5	14.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	69.0	50.1	9.0	74.0	51.9	52.4	67.3	46.9	23.7	52.8	67.9	67.8
LnGrp LOS	E	D	A	E	D	D	E	D	C	D	E	E
Approach Vol, veh/h	683		869			884			870			
Approach Delay, s/veh	51.0		59.4			47.0			66.7			
Approach LOS	D		E			D			E			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	27.1	25.7	16.4	35.8	19.1	33.7	20.8	31.5				
Change Period (Y+Rc), s	5.7	* 5.7	5.3	5.3	5.3	5.7	5.3	5.3				
Max Green Setting (Gmax), s	28.8	* 28	13.7	32.7	19.3	32.7	10.2	36.2				
Max Q Clear Time (g_c+0.1), s	16.3	16.3	11.2	28.8	13.7	20.4	6.5	22.5				
Green Ext Time (p_c), s	0.2	2.3	0.1	1.8	0.2	2.6	0.0	3.7				

Intersection Summary

HCM 6th Ctrl Delay 56.3

HCM 6th LOS E

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary 5: Ridley Ave & Guerneville Rd

Lance Drive Residential TIA
Existing Plus Project PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	669	33	66	814	2	14	0	46	3	0	8
Future Volume (veh/h)	5	669	33	66	814	2	14	0	46	3	0	8
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	0.99		0.98	0.99		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	5	719	26	71	875	2	15	0	9	3	0	0
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	609	3144	114	685	3269	7	78	5	20	116	0	0
Arrive On Green	0.91	0.91	0.91	0.91	0.91	0.91	0.04	0.00	0.04	0.04	0.00	0.00
Sat Flow, veh/h	627	3470	125	709	3608	8	798	125	554	1543	0	0
Grp Volume(v), veh/h	5	365	380	71	427	450	24	0	0	3	0	0
Grp Sat Flow(s),veh/h/ln	627	1763	1833	709	1763	1854	1477	0	0	1543	0	0
Q Serve(g_s), s	0.1	2.9	2.9	1.6	3.6	3.6	1.3	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	3.7	2.9	2.9	4.5	3.6	3.6	1.9	0.0	0.0	0.2	0.0	0.0
Prop In Lane	1.00		0.07	1.00		0.00	0.62		0.37	1.00		0.00
Lane Grp Cap(c), veh/h	609	1597	1660	685	1597	1680	103	0	0	116	0	0
V/C Ratio(X)	0.01	0.23	0.23	0.10	0.27	0.27	0.23	0.00	0.00	0.03	0.00	0.00
Avail Cap(c_a), veh/h	609	1597	1660	685	1597	1680	447	0	0	447	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.92	0.92	0.92	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.9	0.7	0.7	0.9	0.7	0.7	56.6	0.0	0.0	55.8	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.3	0.3	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.1	0.1	0.1	0.0	0.0	0.7	0.0	0.0	0.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	1.0	1.0	1.0	1.0	0.7	0.7	57.0	0.0	0.0	55.8	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	E	A	A	E	A	A
Approach Vol, veh/h	750			948			24			3		
Approach Delay, s/veh	1.0			0.7			57.0			55.8		
Approach LOS	A			A			E			E		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	112.6			7.4			112.6			7.4		
Change Period (Y+Rc), s	3.9			3.0			3.9			3.0		
Max Green Setting (Gmax), s	80.1			33.0			80.1			33.0		
Max Q Clear Time (g_c+I1), s	5.7			2.2			6.5			3.9		
Green Ext Time (p_c), s	1.4			0.0			1.9			0.0		

Intersection Summary

HCM 6th Ctrl Delay	1.7
HCM 6th LOS	A

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

6: Lance Dr & Guerneville Rd

Lance Drive Residential TIA
Existing Plus Project PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	108	575	11	53	862	225	4	38	37	124	40	64
Future Volume (veh/h)	108	575	11	53	862	225	4	38	37	124	40	64
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.99	0.99		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	112	599	10	55	898	216	4	40	4	129	42	55
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	138	668	11	288	964	420	42	279	26	193	52	64
Arrive On Green	0.03	0.06	0.06	0.16	0.27	0.27	0.17	0.17	0.17	0.17	0.17	0.17
Sat Flow, veh/h	1767	3547	59	1767	3526	1535	56	1611	152	842	301	368
Grp Volume(v), veh/h	112	298	311	55	898	216	48	0	0	226	0	0
Grp Sat Flow(s), veh/h/ln	1767	1763	1843	1767	1763	1535	1819	0	0	1510	0	0
Q Serve(g_s), s	7.6	20.1	20.1	3.2	29.8	14.3	0.0	0.0	0.0	14.7	0.0	0.0
Cycle Q Clear(g_c), s	7.6	20.1	20.1	3.2	29.8	14.3	2.7	0.0	0.0	17.3	0.0	0.0
Prop In Lane	1.00		0.03	1.00		1.00	0.08		0.08	0.57		0.24
Lane Grp Cap(c), veh/h	138	332	347	288	964	420	348	0	0	309	0	0
V/C Ratio(X)	0.81	0.90	0.90	0.19	0.93	0.51	0.14	0.00	0.00	0.73	0.00	0.00
Avail Cap(c_a), veh/h	202	848	886	288	1695	738	533	0	0	463	0	0
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.91	0.91	0.91	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	57.6	55.1	55.1	43.4	42.5	36.9	42.1	0.0	0.0	47.9	0.0	0.0
Incr Delay (d2), s/veh	9.3	3.5	3.4	0.1	15.4	4.1	0.1	0.0	0.0	1.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	9.8	10.3	1.4	14.6	5.7	1.2	0.0	0.0	6.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	66.9	58.6	58.5	43.5	57.9	40.9	42.2	0.0	0.0	49.2	0.0	0.0
LnGrp LOS	E	E	E	D	E	D	D	A	A	D	A	A
Approach Vol, veh/h	721			1169			48			226		
Approach Delay, s/veh	59.8			54.1			42.2			49.2		
Approach LOS	E			D			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	24.9	27.9		25.4	14.6	38.1		25.4				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		4.6				
Max Green Setting (Gmax), s	33.4	57.7		33.4	13.7	57.7		33.4				
Max Q Clear Time (g_c+15), s	15.2	22.1		19.3	9.6	31.8		4.7				
Green Ext Time (p_c), s	0.0	0.5		0.3	0.0	1.0		0.0				

Intersection Summary

HCM 6th Ctrl Delay	55.2
HCM 6th LOS	E

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

7: N Dutton Ave/Westberry Dr & Guerneville Rd

Lance Drive Residential TIA
Existing Plus Project PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	670	119	440	915	17	191	4	429	6	4	4
Future Volume (veh/h)	3	670	119	440	915	17	191	4	429	6	4	4
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	3	720	122	473	984	17	208	0	123	6	4	0
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	8	769	130	1628	2574	44	264	0	863	25	17	0
Arrive On Green	0.00	0.26	0.26	0.95	1.00	1.00	0.07	0.00	0.07	0.02	0.02	0.00
Sat Flow, veh/h	1767	3004	509	3428	3544	61	3534	0	1560	1081	721	0
Grp Volume(v), veh/h	3	422	420	473	489	512	208	0	123	10	0	0
Grp Sat Flow(s), veh/h/ln	1767	1763	1750	1714	1763	1843	1767	0	1560	1801	0	0
Q Serve(g_s), s	0.2	28.1	28.2	1.1	0.0	0.0	6.9	0.0	0.0	0.7	0.0	0.0
Cycle Q Clear(g_c), s	0.2	28.1	28.2	1.1	0.0	0.0	6.9	0.0	0.0	0.7	0.0	0.0
Prop In Lane	1.00		0.29	1.00		0.03	1.00		1.00	0.60		0.00
Lane Grp Cap(c), veh/h	8	451	448	1628	1280	1338	264	0	863	42	0	0
V/C Ratio(X)	0.36	0.94	0.94	0.29	0.38	0.38	0.79	0.00	0.14	0.24	0.00	0.00
Avail Cap(c_a), veh/h	88	535	531	1628	1280	1338	345	0	899	416	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.96	0.96	0.96	0.68	0.68	0.68	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	59.5	43.7	43.7	1.6	0.0	0.0	54.6	0.0	13.2	57.5	0.0	0.0
Incr Delay (d2), s/veh	8.8	28.2	28.5	0.0	0.6	0.6	6.4	0.0	0.0	1.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	15.4	15.4	0.3	0.2	0.2	3.3	0.0	1.6	0.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	68.4	71.8	72.1	1.6	0.6	0.6	61.0	0.0	13.2	58.6	0.0	0.0
LnGrp LOS	E	E	E	A	A	A	E	A	B	E	A	A
Approach Vol, veh/h	845			1474			331			10		
Approach Delay, s/veh	72.0			0.9			43.3			58.6		
Approach LOS	E			A			D			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	62.3	36.0		7.4	5.9	92.4		14.3				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		5.3				
Max Green Setting (Gmax), s	28.5	36.4		27.7	6.0	54.1		11.7				
Max Q Clear Time (g_c+I1), s	13.6	30.2		2.7	2.2	2.0		8.9				
Green Ext Time (p_c), s	0.1	0.6		0.0	0.0	0.8		0.0				

Intersection Summary

HCM 6th Ctrl Delay 29.0
HCM 6th LOS C

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 8: Herbert St/Coffey Ln & Guerneville Rd

Lance Drive Residential TIA
Existing Plus Project PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	163	880	52	48	1143	88	37	20	28	97	23	217
Future Volume (veh/h)	163	880	52	48	1143	88	37	20	28	97	23	217
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.99	1.00		0.93	1.00		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	177	957	54	52	1242	91	40	22	14	105	25	69
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	158	991	56	597	1803	132	79	44	28	165	39	310
Arrive On Green	0.18	0.59	0.59	0.34	0.54	0.54	0.09	0.09	0.09	0.11	0.11	0.11
Sat Flow, veh/h	1767	3383	191	1767	3329	243	908	499	318	1441	343	1483
Grp Volume(v), veh/h	177	499	512	52	657	676	76	0	0	130	0	69
Grp Sat Flow(s),veh/h/ln	1767	1763	1811	1767	1763	1809	1724	0	0	1784	0	1483
Q Serve(g_s), s	10.7	32.4	32.4	2.4	32.7	32.8	5.1	0.0	0.0	8.4	0.0	4.7
Cycle Q Clear(g_c), s	10.7	32.4	32.4	2.4	32.7	32.8	5.1	0.0	0.0	8.4	0.0	4.7
Prop In Lane	1.00		0.11	1.00		0.13	0.53		0.18	0.81		1.00
Lane Grp Cap(c), veh/h	158	516	530	597	955	980	150	0	0	204	0	310
V/C Ratio(X)	1.12	0.97	0.97	0.09	0.69	0.69	0.51	0.00	0.00	0.64	0.00	0.22
Avail Cap(c_a), veh/h	158	623	640	597	955	980	359	0	0	386	0	461
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.86	0.86	0.86	0.79	0.79	0.79	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	49.3	24.3	24.3	27.1	20.1	20.1	52.3	0.0	0.0	50.7	0.0	39.9
Incr Delay (d2), s/veh	103.5	29.3	28.8	0.0	3.2	3.2	1.0	0.0	0.0	1.2	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.7	12.4	12.7	1.0	13.3	13.7	2.2	0.0	0.0	3.8	0.0	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	152.8	53.6	53.1	27.1	23.3	23.3	53.3	0.0	0.0	52.0	0.0	40.0
LnGrp LOS	F	D	D	C	C	C	D	A	A	D	A	D
Approach Vol, veh/h	1188			1385			76			199		
Approach Delay, s/veh	68.1			23.4			53.3			47.8		
Approach LOS	E			C			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	45.9	40.4		18.6	16.0	70.3		15.1				
Change Period (Y+Rc), s	5.3	5.3		4.9	5.3	5.3		4.6				
Max Green Setting (Gmax), s	6.5	42.4		26.0	10.7	38.2		25.0				
Max Q Clear Time (g_c+14), s	14.4	34.4		10.4	12.7	34.8		7.1				
Green Ext Time (p_c), s	0.0	0.7		0.1	0.0	0.7		0.1				

Intersection Summary









HCM 6th Ctrl Delay	44.6
HCM 6th LOS	D

HCM 6th Signalized Intersection Summary

9: Range Ave & Guerneville Rd

Lance Drive Residential TIA
Existing Plus Project PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	145	638	198	81	800	16	271	151	134	83	217	235
Future Volume (veh/h)	145	638	198	81	800	16	271	151	134	83	217	235
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No		No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	151	665	0	84	833	0	174	308	83	86	226	84
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	543	1767		106	893		278	442	117	196	278	99
Arrive On Green	0.61	1.00	0.00	0.06	0.25	0.00	0.16	0.16	0.16	0.04	0.04	0.04
Sat Flow, veh/h	1767	3618	0	1767	3618	0	1767	2811	742	1767	2504	895
Grp Volume(v), veh/h	151	665	0	84	833	0	174	201	190	86	156	154
Grp Sat Flow(s),veh/h/ln	1767	1763	0	1767	1763	0	1767	1856	1698	1767	1763	1636
Q Serve(g_s), s	4.8	0.0	0.0	5.6	27.7	0.0	11.0	12.3	12.7	5.7	10.6	11.2
Cycle Q Clear(g_c), s	4.8	0.0	0.0	5.6	27.7	0.0	11.0	12.3	12.7	5.7	10.6	11.2
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.44	1.00		0.55
Lane Grp Cap(c), veh/h	543	1767		106	893		278	292	267	196	196	182
V/C Ratio(X)	0.28	0.38		0.80	0.93		0.63	0.69	0.71	0.44	0.80	0.85
Avail Cap(c_a), veh/h	543	1767		143	1002		486	510	467	246	245	228
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	0.79	0.79	0.00	0.93	0.93	0.00	1.00	1.00	1.00	0.58	0.58	0.58
Uniform Delay (d), s/veh	16.9	0.0	0.0	55.7	43.8	0.0	47.3	47.8	48.0	54.1	56.5	56.8
Incr Delay (d2), s/veh	0.1	0.5	0.0	13.1	12.6	0.0	0.9	1.1	1.3	0.3	6.6	10.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	0.1	0.0	2.9	13.4	0.0	4.9	5.8	5.5	2.6	5.3	5.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.0	0.5	0.0	68.8	56.4	0.0	48.1	48.9	49.3	54.5	63.1	67.7
LnGrp LOS	B	A		E	E		D	D	D	D	E	E
Approach Vol, veh/h	816		A	917		A	565		396			
Approach Delay, s/veh	3.5			57.5			48.8		63.0			
Approach LOS	A			E			D		E			
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	2.5	65.4		18.6	42.2	35.7		23.5				
Change Period (Y+Rc), s	5.3	5.3		5.3	5.3	5.3		4.6				
Max Green Setting (Gmax), s	40.1	40.1		16.7	15.7	34.1		33.0				
Max Q Clear Time (g_c+11), s	2.0	2.0		13.2	6.8	29.7		14.7				
Green Ext Time (p_c), s	0.0	0.8		0.1	0.0	0.7		0.3				

Intersection Summary

HCM 6th Ctrl Delay 40.2

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

10: Guerneville Rd & Steele Wy

Lance Drive Residential TIA
Existing Plus Project PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	739	100	128	816	10	64	34	156	312	48	17
Future Volume (veh/h)	16	739	100	128	816	10	64	34	156	312	48	17
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	16	754	71	131	833	9	50	56	70	353	0	5
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	681	2035	1016	200	895	10	136	143	210	447	0	799
Arrive On Green	0.26	0.39	0.39	0.06	0.25	0.25	0.08	0.08	0.08	0.13	0.00	0.13
Sat Flow, veh/h	1767	3526	1550	3428	3572	39	1767	1856	1530	3534	0	1525
Grp Volume(v), veh/h	16	754	71	131	411	431	50	56	70	353	0	5
Grp Sat Flow(s), veh/h/ln	1767	1763	1550	1714	1763	1848	1767	1856	1530	1767	0	1525
Q Serve(g_s), s	0.8	18.4	2.8	4.5	27.3	27.4	3.2	3.4	5.0	11.6	0.0	0.0
Cycle Q Clear(g_c), s	0.8	18.4	2.8	4.5	27.3	27.4	3.2	3.4	5.0	11.6	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.02	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	681	2035	1016	200	442	463	136	143	210	447	0	799
V/C Ratio(X)	0.02	0.37	0.07	0.66	0.93	0.93	0.37	0.39	0.33	0.79	0.00	0.01
Avail Cap(c_a), veh/h	681	2035	1016	271	580	608	398	417	436	798	0	950
HCM Platoon Ratio	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.86	0.86	0.86	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.7	21.2	11.1	55.3	44.0	44.0	52.6	52.7	47.0	50.9	0.0	14.4
Incr Delay (d2), s/veh	0.0	0.4	0.1	1.4	16.6	16.0	0.6	0.6	0.3	1.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	8.2	1.2	2.0	13.8	14.4	1.5	1.6	1.9	5.2	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.7	21.6	11.2	56.7	60.5	60.0	53.2	53.3	47.3	52.1	0.0	14.4
LnGrp LOS	C	C	B	E	E	E	D	D	D	D	A	B
Approach Vol, veh/h	841			973			176			358		
Approach Delay, s/veh	20.9			59.8			50.9			51.5		
Approach LOS	C			E			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	1.9	74.2		20.1	51.1	35.0		13.8				
Change Period (Y+Rc), s	4.9	4.9		4.9	4.9	4.9		4.6				
Max Green Setting (Gmax), s	27.5	37.1		27.1	7.1	39.5		27.0				
Max Q Clear Time (g_c+16), s	20.4	20.4		13.6	2.8	29.4		7.0				
Green Ext Time (p_c), s	0.0	1.0		0.1	0.0	0.7		0.0				

Intersection Summary

HCM 6th Ctrl Delay 43.9

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

11: Cleveland Ave & Guerneville Rd

Lance Drive Residential TIA
Existing Plus Project PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	RT	LT	RT	RT	LT	RT	RT	LT	RT	RT	LT	RT
Traffic Volume (veh/h)	110	1049	74	302	1235	197	85	130	227	405	340	111
Future Volume (veh/h)	110	1049	74	302	1235	197	85	130	227	405	340	111
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.98	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	115	1093	68	315	1286	129	89	135	68	292	536	99
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	196	1610	100	369	1345	587	351	458	218	352	604	111
Arrive On Green	0.06	0.33	0.33	0.07	0.26	0.26	0.20	0.20	0.20	0.20	0.20	0.20
Sat Flow, veh/h	3428	4867	302	3428	3526	1539	1767	2303	1094	1767	3032	557
Grp Volume(v), veh/h	115	758	403	315	1286	129	89	101	102	292	327	308
Grp Sat Flow(s),veh/h/ln	1714	1689	1792	1714	1763	1539	1767	1763	1635	1767	1856	1734
Q Serve(g_s), s	3.9	23.2	23.3	10.9	43.1	7.9	5.1	5.9	6.4	19.0	20.6	20.8
Cycle Q Clear(g_c), s	3.9	23.2	23.3	10.9	43.1	7.9	5.1	5.9	6.4	19.0	20.6	20.8
Prop In Lane	1.00		0.17	1.00		1.00	1.00		0.67	1.00		0.32
Lane Grp Cap(c), veh/h	196	1117	593	369	1345	587	351	351	325	352	369	345
V/C Ratio(X)	0.59	0.68	0.68	0.85	0.96	0.22	0.25	0.29	0.31	0.83	0.88	0.89
Avail Cap(c_a), veh/h	203	1117	593	506	1384	604	351	351	325	443	465	435
HCM Platoon Ratio	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.51	0.51	0.51	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	55.2	34.6	34.7	54.7	43.7	30.6	40.6	40.9	41.1	46.1	46.7	46.8
Incr Delay (d2), s/veh	2.6	1.4	2.6	4.1	8.9	0.0	1.7	2.1	2.5	8.4	13.5	15.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	9.6	10.4	5.0	21.0	3.0	2.4	2.8	2.8	9.1	10.7	10.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.8	36.0	37.2	58.9	52.5	30.6	42.3	42.9	43.6	54.5	60.2	62.0
LnGrp LOS	E	D	D	E	D	C	D	D	D	D	E	E
Approach Vol, veh/h	1276			1730			292			927		
Approach Delay, s/veh	38.4			52.1			43.0			59.0		
Approach LOS	D			D			D			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	44.6			28.8	11.7	50.7		28.8				
Change Period (Y+Rc), s	4.9	4.9		4.9	4.9	4.9		4.9				
Max Green Setting (Gmax), s	36.5			16.1	7.1	47.1		30.1				
Max Q Clear Time (g_c+11.2, s)	25.3			8.4	5.9	45.1		22.8				
Green Ext Time (p_c), s	0.0	1.3		0.1	0.0	0.7		0.4				

Intersection Summary

HCM 6th Ctrl Delay 48.8

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 12: US 101 SB Ramps & Guerneville Rd

Lance Drive Residential TIA
Existing Plus Project PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑					↑	↑	↑
Traffic Volume (veh/h)	0	1152	555	291	1385	0	0	0	0	289	63	363
Future Volume (veh/h)	0	1152	555	291	1385	0	0	0	0	289	63	363
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1856	1856	1856	1856	0				1856	1856	1856
Adj Flow Rate, veh/h	0	1188	247	300	1428	0				344	0	335
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	1430	427	353	1502	0				1749	0	778
Arrive On Green	0.00	0.28	0.28	0.10	0.43	0.00				0.49	0.00	0.49
Sat Flow, veh/h	0	5233	1515	3428	3618	0				3534	0	1572
Grp Volume(v), veh/h	0	1188	247	300	1428	0				344	0	335
Grp Sat Flow(s),veh/h/ln	0	1689	1515	1714	1763	0				1767	0	1572
Q Serve(g_s), s	0.0	26.4	16.8	10.3	46.9	0.0				6.5	0.0	16.4
Cycle Q Clear(g_c), s	0.0	26.4	16.8	10.3	46.9	0.0				6.5	0.0	16.4
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1430	427	353	1502	0				1749	0	778
V/C Ratio(X)	0.00	0.83	0.58	0.85	0.95	0.00				0.20	0.00	0.43
Avail Cap(c_a), veh/h	0	1988	594	546	2089	0				1749	0	778
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.57	0.57	0.75	0.75	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	40.4	36.9	52.9	33.2	0.0				17.0	0.0	19.5
Incr Delay (d2), s/veh	0.0	0.9	0.3	3.5	5.8	0.0				0.3	0.0	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	10.9	6.2	4.6	20.4	0.0				2.6	0.0	6.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	41.3	37.2	56.4	39.0	0.0				17.2	0.0	21.2
LnGrp LOS	A	D	D	E	D	A				B	A	C
Approach Vol, veh/h		1435			1728						679	
Approach Delay, s/veh		40.6			42.0						19.2	
Approach LOS		D			D						B	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	7.3	38.8		64.0		56.0						
Change Period (Y+Rc), s	4.9	4.9		4.6		4.9						
Max Green Setting (Gmax), s	47.1			39.4		71.1						
Max Q Clear Time (g_c+I12, s)	28.4			18.4		48.9						
Green Ext Time (p_c), s	0.0	1.7		0.1		2.2						

Intersection Summary

HCM 6th Ctrl Delay	37.4
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 13: US 101 NB Ramps & Guerneville Rd/Steele Ln

Lance Drive Residential TIA
Existing Plus Project PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↱↱			↱↱↱		↰	↰↱	↱			
Traffic Volume (veh/h)	417	1024	0	0	996	232	680	1	329	0	0	0
Future Volume (veh/h)	417	1024	0	0	996	232	680	1	329	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1856	1856	0	0	1856	1856	1856	1856	1856			
Adj Flow Rate, veh/h	434	1067	0	0	1038	214	781	0	156			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	3	3	0	0	3	3	3	3	3			
Cap, veh/h	1286	2419	0	0	1132	233	829	0	369			
Arrive On Green	0.75	1.00	0.00	0.00	0.27	0.27	0.23	0.00	0.23			
Sat Flow, veh/h	3428	3618	0	0	4358	863	3534	0	1572			
Grp Volume(v), veh/h	434	1067	0	0	836	416	781	0	156			
Grp Sat Flow(s),veh/h/ln	1714	1763	0	0	1689	1676	1767	0	1572			
Q Serve(g_s), s	5.1	0.0	0.0	0.0	28.8	28.9	26.1	0.0	10.1			
Cycle Q Clear(g_c), s	5.1	0.0	0.0	0.0	28.8	28.9	26.1	0.0	10.1			
Prop In Lane	1.00		0.00	0.00		0.51	1.00		1.00			
Lane Grp Cap(c), veh/h	1286	2419	0	0	912	453	829	0	369			
V/C Ratio(X)	0.34	0.44	0.00	0.00	0.92	0.92	0.94	0.00	0.42			
Avail Cap(c_a), veh/h	1286	2419	0	0	1174	582	1249	0	556			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.68	0.68	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	10.0	0.0	0.0	0.0	42.5	42.5	45.1	0.0	39.0			
Incr Delay (d2), s/veh	0.0	0.4	0.0	0.0	8.4	15.1	8.3	0.0	0.3			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	1.6	0.1	0.0	0.0	12.8	13.6	12.0	0.0	3.8			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.0	0.4	0.0	0.0	50.9	57.6	53.4	0.0	39.3			
LnGrp LOS	B	A	A	A	D	E	D	A	D			
Approach Vol, veh/h	1501			1252			937					
Approach Delay, s/veh	3.2			53.1			51.0					
Approach LOS	A			D			D					
Timer - Assigned Phs	2			5			6			8		
Phs Duration (G+Y+Rc), s	87.2			49.9			37.3			32.8		
Change Period (Y+Rc), s	4.9			4.9			4.9			4.6		
Max Green Setting (Gmax), s	68.1			21.5			41.7			42.4		
Max Q Clear Time (g_c+I1), s	2.0			7.1			30.9			28.1		
Green Ext Time (p_c), s	1.5			0.1			1.5			0.1		

Intersection Summary

HCM 6th Ctrl Delay	32.3
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 14: Stony Point Rd/Marlow Rd & W College Ave

Lance Drive Residential TIA
Existing Plus Project PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	76	236	104	215	331	191	153	758	254	152	815	108
Future Volume (veh/h)	76	236	104	215	331	191	153	758	254	152	815	108
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	80	248	66	226	348	133	161	798	134	160	858	105
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	412	323	84	504	423	159	190	958	868	264	988	121
Arrive On Green	0.23	0.12	0.12	0.29	0.17	0.17	0.11	0.27	0.27	0.15	0.31	0.31
Sat Flow, veh/h	1767	2755	716	1767	2495	936	1767	3526	1544	1767	3155	386
Grp Volume(v), veh/h	80	157	157	226	244	237	161	798	134	160	479	484
Grp Sat Flow(s),veh/h/ln	1767	1763	1709	1767	1763	1668	1767	1763	1544	1767	1763	1778
Q Serve(g_s), s	4.4	10.3	10.8	12.6	16.0	16.5	10.7	25.6	1.8	10.2	30.8	30.8
Cycle Q Clear(g_c), s	4.4	10.3	10.8	12.6	16.0	16.5	10.7	25.6	1.8	10.2	30.8	30.8
Prop In Lane	1.00		0.42	1.00		0.56	1.00		1.00	1.00		0.22
Lane Grp Cap(c), veh/h	412	207	200	504	299	283	190	958	868	264	552	557
V/C Ratio(X)	0.19	0.76	0.79	0.45	0.82	0.84	0.85	0.83	0.15	0.61	0.87	0.87
Avail Cap(c_a), veh/h	412	289	281	504	299	283	305	1254	998	349	671	677
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.46	0.46	0.46	1.00	1.00	1.00	0.50	0.50	0.50
Uniform Delay (d), s/veh	37.0	51.3	51.5	35.1	48.0	48.2	52.6	41.1	4.2	47.8	38.9	38.9
Incr Delay (d2), s/veh	0.2	7.2	9.4	0.3	8.0	10.0	11.7	3.8	0.1	1.1	5.4	5.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	4.9	5.0	5.3	7.6	7.5	5.3	11.3	0.7	4.5	13.7	13.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.2	58.5	60.9	35.4	56.1	58.3	64.2	45.0	4.2	48.9	44.3	44.3
LnGrp LOS	D	E	E	D	E	E	E	D	A	D	D	D
Approach Vol, veh/h	394				707				1093			
Approach Delay, s/veh	55.1				50.2				42.8			
Approach LOS	E				D				D			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	39.5	19.4	18.2	42.9	33.3	25.6	23.2	37.9				
Change Period (Y+Rc), s	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3				
Max Green Setting (Gmax), s	19.7	19.7	20.7	45.7	12.7	19.7	23.7	42.7				
Max Q Clear Time (g_c+14.6)	12.8	12.8	12.7	32.8	6.4	18.5	12.2	27.6				
Green Ext Time (p_c), s	0.0	0.9	0.2	4.8	0.1	0.3	0.3	5.0				

Intersection Summary

HCM 6th Ctrl Delay 46.6

HCM 6th LOS D

Notes









User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

15: N Dutton Ave & W College Ave

Lance Drive Residential TIA
Existing Plus Project PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	76	558	96	180	747	179	134	340	124	303	499	132
Future Volume (veh/h)	76	558	96	180	747	179	134	340	124	303	499	132
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	79	581	88	188	778	168	140	354	95	316	520	118
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	100	644	97	230	838	181	546	419	111	679	649	146
Arrive On Green	0.06	0.21	0.21	0.13	0.29	0.29	0.31	0.15	0.15	0.38	0.23	0.23
Sat Flow, veh/h	1767	3063	463	1767	2874	621	1767	2744	725	1767	2845	642
Grp Volume(v), veh/h	79	334	335	188	477	469	140	225	224	316	321	317
Grp Sat Flow(s),veh/h/ln	1767	1763	1763	1767	1763	1732	1767	1763	1706	1767	1763	1724
Q Serve(g_s), s	5.3	22.1	22.3	12.4	31.6	31.6	7.1	14.9	15.3	16.1	20.6	20.9
Cycle Q Clear(g_c), s	5.3	22.1	22.3	12.4	31.6	31.6	7.1	14.9	15.3	16.1	20.6	20.9
Prop In Lane	1.00		0.26	1.00		0.36	1.00		0.43	1.00		0.37
Lane Grp Cap(c), veh/h	100	370	370	230	514	505	546	269	261	679	402	393
V/C Ratio(X)	0.79	0.90	0.91	0.82	0.93	0.93	0.26	0.84	0.86	0.47	0.80	0.81
Avail Cap(c_a), veh/h	147	457	457	280	589	579	546	325	314	679	516	504
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.84	0.84	0.84	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	55.9	46.2	46.2	50.8	41.3	41.3	31.1	49.4	49.6	27.7	43.7	43.8
Incr Delay (d2), s/veh	7.8	14.2	14.8	12.0	18.7	19.0	0.1	12.8	15.6	0.2	5.2	5.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	11.0	11.1	6.2	16.1	15.9	3.0	7.5	7.6	6.6	9.4	9.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	63.7	60.4	61.0	62.8	60.0	60.3	31.2	62.2	65.2	27.9	48.9	49.4
LnGrp LOS	E	E	E	E	E	E	C	E	E	C	D	D
Approach Vol, veh/h	748			1134			589			954		
Approach Delay, s/veh	61.0			60.6			56.0			42.1		
Approach LOS	E			E			E			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	29.1	29.1	40.1	31.3	9.8	38.9	49.1	22.2				
Change Period (Y+Rc), s	3.9	* 3.9	3.0	3.9	3.0	3.9	3.0	3.9				
Max Green Setting (Gmax), s	31.0	* 31	21.0	35.1	10.0	40.1	34.0	22.1				
Max Q Clear Time (g_c+14.4), s	24.3	24.3	9.1	22.9	7.3	33.6	18.1	17.3				
Green Ext Time (p_c), s	0.0	0.9	0.0	1.1	0.0	1.4	0.1	0.5				

Intersection Summary

HCM 6th Ctrl Delay 54.7

HCM 6th LOS D

Notes





User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection

Intersection Delay, s/veh 8.7

Intersection LOS A




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	50	0	62	78	92	0	6	36	76	7	13
Future Vol, veh/h	7	50	0	62	78	92	0	6	36	76	7	13
Peak Hour Factor	0.86	0.86	0.92	0.92	0.86	0.86	0.92	0.92	0.92	0.86	0.92	0.86
Heavy Vehicles, %	3	3	2	2	3	3	2	2	2	3	2	3
Mvmt Flow	8	58	0	67	91	107	0	7	39	88	8	15
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.1	9.1	7.6	8.7
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	12%	27%	79%
Vol Thru, %	14%	88%	34%	7%
Vol Right, %	86%	0%	40%	14%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	42	57	232	96
LT Vol	0	7	62	76
Through Vol	6	50	78	7
RT Vol	36	0	92	13
Lane Flow Rate	46	66	265	111
Geometry Grp	1	1	1	1
Degree of Util (X)	0.054	0.085	0.309	0.149
Departure Headway (Hd)	4.294	4.631	4.202	4.814
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	834	774	856	745
Service Time	2.323	2.655	2.22	2.839
HCM Lane V/C Ratio	0.055	0.085	0.31	0.149
HCM Control Delay	7.6	8.1	9.1	8.7
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.2	0.3	1.3	0.5




HCM 6th TWSC
17: Iroquois St & Project Driveway (1)

Lance Drive Residential TIA
Existing Plus Project PM (120 Seconds)

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	5	8	90	87	3
Future Vol, veh/h	1	5	8	90	87	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	5	9	98	95	3
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	213	97	98	0	-	0
Stage 1	97	-	-	-	-	-
Stage 2	116	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	775	959	1495	-	-	-
Stage 1	927	-	-	-	-	-
Stage 2	909	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	770	959	1495	-	-	-
Mov Cap-2 Maneuver	770	-	-	-	-	-
Stage 1	921	-	-	-	-	-
Stage 2	909	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	8.9	0.6		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1495	-	921	-	-	
HCM Lane V/C Ratio	0.006	-	0.007	-	-	
HCM Control Delay (s)	7.4	0	8.9	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	




HCM 6th TWSC
18: Iroquois St & Project Driveway (2)

Lance Drive Residential TIA
Existing Plus Project PM (120 Seconds)

Intersection						
Int Delay, s/veh	0.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	6	9	96	90	2
Future Vol, veh/h	2	6	9	96	90	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	7	10	104	98	2
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	223	99	100	0	-	0
Stage 1	99	-	-	-	-	-
Stage 2	124	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	765	957	1493	-	-	-
Stage 1	925	-	-	-	-	-
Stage 2	902	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	760	957	1493	-	-	-
Mov Cap-2 Maneuver	760	-	-	-	-	-
Stage 1	919	-	-	-	-	-
Stage 2	902	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	9	0.6		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1493	-	899	-	-	
HCM Lane V/C Ratio	0.007	-	0.01	-	-	
HCM Control Delay (s)	7.4	0	9	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	

HCM 6th TWSC
19: Project Driveway (3) & Lance Dr

Lance Drive Residential TIA
Existing Plus Project PM (120 Seconds)

Intersection						
Int Delay, s/veh	1.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	159	3	43	229	3	27
Future Vol, veh/h	159	3	43	229	3	27
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	173	3	47	249	3	29
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	176	0	518	175
Stage 1	-	-	-	-	175	-
Stage 2	-	-	-	-	343	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1400	-	518	868
Stage 1	-	-	-	-	855	-
Stage 2	-	-	-	-	719	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1400	-	498	868
Mov Cap-2 Maneuver	-	-	-	-	498	-
Stage 1	-	-	-	-	855	-
Stage 2	-	-	-	-	691	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		1.2		9.6	
HCM LOS	A					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	808	-	-	1400	-	
HCM Lane V/C Ratio	0.04	-	-	0.033	-	
HCM Control Delay (s)	9.6	-	-	7.7	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0.1	-	-	0.1	-	

HCM 6th TWSC
20: Guerneville Rd & Project Driveway (4)






















Lance Drive Residential TIA
Existing Plus Project PM (120 Seconds)

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕↕	↕↕		↕	
Traffic Vol, veh/h	9	681	910	20	13	5
Future Vol, veh/h	9	681	910	20	13	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	740	989	22	14	5
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	1011	0	-	0	1390	506
Stage 1	-	-	-	-	1000	-
Stage 2	-	-	-	-	390	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	681	-	-	-	133	512
Stage 1	-	-	-	-	317	-
Stage 2	-	-	-	-	653	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	681	-	-	-	130	512
Mov Cap-2 Maneuver	-	-	-	-	130	-
Stage 1	-	-	-	-	309	-
Stage 2	-	-	-	-	653	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.2	0		29.9		
HCM LOS				D		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	681	-	-	-	164	
HCM Lane V/C Ratio	0.014	-	-	-	0.119	
HCM Control Delay (s)	10.4	0.1	-	-	29.9	
HCM Lane LOS	B	A	-	-	D	
HCM 95th %tile Q(veh)	0	-	-	-	0.4	

HCM 6th Signalized Intersection Summary







1: Marlow Rd & Marlow Ct/W Steele Ln

Lance Drive Residential TIA
Existing Plus Project PM (120-140 Seconds)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	0	2	163	4	142	5	624	161	117	708	2
Future Volume (veh/h)	2	0	2	163	4	142	5	624	161	117	708	2
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.96	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	2	0	0	175	0	91	5	657	116	123	745	2
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	42	0	0	1897	0	972	11	779	1179	147	1074	3
Arrive On Green	0.02	0.00	0.00	0.54	0.00	0.54	0.01	0.22	0.22	0.08	0.30	0.30
Sat Flow, veh/h	1767	0	0	3534	0	1568	1767	3526	1516	1767	3607	10
Grp Volume(v), veh/h	2	0	0	175	0	91	5	657	116	123	364	383
Grp Sat Flow(s),veh/h/ln	1767	0	0	1767	0	1568	1767	1763	1516	1767	1763	1854
Q Serve(g_s), s	0.2	0.0	0.0	3.4	0.0	0.0	0.4	25.0	2.8	9.6	25.6	25.6
Cycle Q Clear(g_c), s	0.2	0.0	0.0	3.4	0.0	0.0	0.4	25.0	2.8	9.6	25.6	25.6
Prop In Lane	1.00		0.00	1.00		1.00	1.00		1.00	1.00		0.01
Lane Grp Cap(c), veh/h	42	0	0	1897	0	972	11	779	1179	147	525	552
V/C Ratio(X)	0.05	0.00	0.00	0.09	0.00	0.09	0.45	0.84	0.10	0.84	0.69	0.69
Avail Cap(c_a), veh/h	379	0	0	1897	0	972	64	1010	1278	228	669	703
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.66	0.66	0.66	1.00	1.00	1.00
Uniform Delay (d), s/veh	66.8	0.0	0.0	15.8	0.0	10.7	69.3	52.2	4.5	63.2	43.5	43.5
Incr Delay (d2), s/veh	0.5	0.0	0.0	0.1	0.0	0.2	17.5	3.6	0.0	14.5	2.2	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.0	1.4	0.0	1.2	0.2	11.4	3.4	4.9	11.4	12.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	67.3	0.0	0.0	15.9	0.0	10.9	86.8	55.8	4.5	77.7	45.7	45.6
LnGrp LOS	E	A	A	B	A	B	F	E	A	E	D	D
Approach Vol, veh/h	2			266				778				870
Approach Delay, s/veh	67.3			14.2				48.3				50.2
Approach LOS	E			B				D				D
Timer - Assigned Phs	2		3	4		6		7	8			
Phs Duration (G+Y+Rc), s	79.7		5.8	46.6		7.9		16.5	35.8			
Change Period (Y+Rc), s	4.6		4.9	4.9		4.6		4.9	4.9			
Max Green Setting (Gmax), s	32.8		5.1	53.1		30.0		18.1	40.1			
Max Q Clear Time (g_c+I1), s	5.4		2.4	27.6		2.2		11.6	27.0			
Green Ext Time (p_c), s	0.9		0.0	4.7		0.0		0.1	3.9			
Intersection Summary												
HCM 6th Ctrl Delay	44.5											
HCM 6th LOS	D											
Notes												
User approved pedestrian interval to be less than phase max green.												
User approved volume balancing among the lanes for turning movement.												






















HCM 6th TWSC
2: Iroquois St/Apple Valley Ln & W Steele Ln

Lance Drive Residential TIA
Existing Plus Project PM (120-140 Seconds)

Intersection												
Int Delay, s/veh	3.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	24	278	50	50	438	37	47	4	27	22	9	23
Future Vol, veh/h	24	278	50	50	438	37	47	4	27	22	9	23
Conflicting Peds, #/hr	9	0	9	9	0	9	1	0	2	2	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	60	-	-	80	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	25	293	53	53	461	39	49	4	28	23	9	24
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	509	0	0	355	0	0	983	994	331	984	1001	491
Stage 1	-	-	-	-	-	-	379	379	-	596	596	-
Stage 2	-	-	-	-	-	-	604	615	-	388	405	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1051	-	-	1198	-	-	227	244	708	227	242	575
Stage 1	-	-	-	-	-	-	641	613	-	488	490	-
Stage 2	-	-	-	-	-	-	484	481	-	634	597	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1042	-	-	1188	-	-	197	223	701	202	221	570
Mov Cap-2 Maneuver	-	-	-	-	-	-	197	223	-	202	221	-
Stage 1	-	-	-	-	-	-	620	593	-	472	464	-
Stage 2	-	-	-	-	-	-	433	455	-	588	577	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.6			0.8			24.7			20.8		
HCM LOS							C			C		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	264	1042	-	-	1188	-	-	284				
HCM Lane V/C Ratio	0.311	0.024	-	-	0.044	-	-	0.2				
HCM Control Delay (s)	24.7	8.5	-	-	8.2	-	-	20.8				
HCM Lane LOS	C	A	-	-	A	-	-	C				
HCM 95th %tile Q(veh)	1.3	0.1	-	-	0.1	-	-	0.7				

HCM 6th Signalized Intersection Summary 3: Range Ave & W Steele Ln

Lance Drive Residential TIA
Existing Plus Project PM (120-140 Seconds)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	308	61	56	418	44	81	191	40	58	418	48
Future Volume (veh/h)	35	308	61	56	418	44	81	191	40	58	418	48
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.96	1.00		0.92
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	36	321	57	58	435	42	84	199	24	60	435	39
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	608	1092	194	686	1188	115	104	384	46	147	494	44
Arrive On Green	0.71	0.71	0.71	0.71	0.71	0.71	0.06	0.12	0.12	0.08	0.15	0.15
Sat Flow, veh/h	909	1529	272	995	1665	161	1767	3156	375	1767	3246	289
Grp Volume(v), veh/h	36	0	378	58	0	477	84	110	113	60	235	239
Grp Sat Flow(s),veh/h/ln	909	0	1801	995	0	1826	1767	1763	1768	1767	1763	1773
Q Serve(g_s), s	2.2	0.0	10.6	3.1	0.0	14.2	6.6	8.2	8.4	4.5	18.3	18.5
Cycle Q Clear(g_c), s	16.4	0.0	10.6	13.8	0.0	14.2	6.6	8.2	8.4	4.5	18.3	18.5
Prop In Lane	1.00		0.15	1.00		0.09	1.00		0.21	1.00		0.16
Lane Grp Cap(c), veh/h	608	0	1286	686	0	1303	104	214	215	147	268	270
V/C Ratio(X)	0.06	0.00	0.29	0.08	0.00	0.37	0.81	0.51	0.53	0.41	0.88	0.89
Avail Cap(c_a), veh/h	608	0	1286	686	0	1303	215	517	519	177	480	482
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.56	0.56	0.56	1.00	1.00	1.00
Uniform Delay (d), s/veh	10.9	0.0	7.3	9.8	0.0	7.8	65.1	57.6	57.7	60.9	58.1	58.2
Incr Delay (d2), s/veh	0.2	0.0	0.6	0.2	0.0	0.8	3.1	0.4	0.4	0.7	3.6	3.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	4.0	0.7	0.0	5.5	3.0	3.6	3.8	2.0	8.3	8.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.1	0.0	7.8	10.0	0.0	8.6	68.2	58.0	58.1	61.6	61.6	62.0
LnGrp LOS	B	A	A	A	A	A	E	E	E	E	E	E
Approach Vol, veh/h	414		535				307			534		
Approach Delay, s/veh	8.1		8.7				60.8			61.8		
Approach LOS	A		A				E			E		
Timer - Assigned Phs	2		3		4		6		7		8	
Phs Duration (G+Y+Rc), s	103.5		11.3		25.2		103.5		15.5		20.9	
Change Period (Y+Rc), s	3.6		3.0		3.9		3.6		3.9		* 3.9	
Max Green Setting (Gmax), s	74.4		17.0		38.1		74.4		14.0		* 41	
Max Q Clear Time (g_c+I1), s	18.4		8.6		20.5		16.2		6.5		10.4	
Green Ext Time (p_c), s	0.8		0.0		0.8		1.1		0.0		0.4	
Intersection Summary												
HCM 6th Ctrl Delay	33.4											
HCM 6th LOS	C											
Notes												

HCM 6th Signalized Intersection Summary

4: Marlow Rd & Guerneville Rd

Lance Drive Residential TIA
Existing Plus Project PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	166	420	117	274	461	110	130	599	186	65	700	67
Future Volume (veh/h)	166	420	117	274	461	110	130	599	186	65	700	67
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	175	442	66	288	485	96	137	631	116	68	737	65
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	204	587	401	315	682	134	164	769	616	222	822	72
Arrive On Green	0.12	0.17	0.17	0.18	0.23	0.23	0.09	0.22	0.22	0.13	0.25	0.25
Sat Flow, veh/h	1767	3526	1535	1767	2924	575	1767	3526	1537	1767	3271	288
Grp Volume(v), veh/h	175	442	66	288	291	290	137	631	116	68	397	405
Grp Sat Flow(s),veh/h/ln	1767	1763	1535	1767	1763	1736	1767	1763	1537	1767	1763	1797
Q Serve(g_s), s	11.7	14.3	1.6	19.2	18.2	18.4	9.2	20.5	0.0	4.2	26.1	26.2
Cycle Q Clear(g_c), s	11.7	14.3	1.6	19.2	18.2	18.4	9.2	20.5	0.0	4.2	26.1	26.2
Prop In Lane	1.00		1.00	1.00		0.33	1.00		1.00	1.00		0.16
Lane Grp Cap(c), veh/h	204	587	401	315	411	405	164	769	616	222	443	451
V/C Ratio(X)	0.86	0.75	0.16	0.91	0.71	0.72	0.84	0.82	0.19	0.31	0.90	0.90
Avail Cap(c_a), veh/h	284	831	508	349	480	473	202	1064	744	222	480	490
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.97	0.97	0.97	0.53	0.53	0.53	0.82	0.82	0.82
Uniform Delay (d), s/veh	52.1	47.6	8.7	48.4	42.3	42.4	53.6	44.7	23.6	47.7	43.4	43.4
Incr Delay (d2), s/veh	16.9	2.4	0.2	25.6	9.6	10.1	12.7	2.0	0.1	0.6	15.7	15.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.0	6.4	1.0	10.5	8.8	8.9	4.6	9.0	2.1	1.9	13.1	13.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	69.0	50.1	8.9	74.0	51.9	52.4	66.3	46.7	23.7	48.4	59.2	59.0
LnGrp LOS	E	D	A	E	D	D	E	D	C	D	E	E
Approach Vol, veh/h	683			869			884			870		
Approach Delay, s/veh	50.9			59.4			46.7			58.3		
Approach LOS	D			E			D			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	27.1	25.7	16.4	35.4	19.1	33.7	20.4	31.5				
Change Period (Y+Rc), s	5.7	* 5.7	5.3	5.3	5.3	5.7	5.3	5.3				
Max Green Setting (Gmax), s	28.3	* 28	13.7	32.7	19.3	32.7	10.2	36.2				
Max Q Clear Time (g_c+0.1), s	16.3	16.3	11.2	28.2	13.7	20.4	6.2	22.5				
Green Ext Time (p_c), s	0.2	2.3	0.1	2.0	0.2	2.6	0.0	3.7				

Intersection Summary

HCM 6th Ctrl Delay 54.0
HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary

5: Ridley Ave & Guerneville Rd

Lance Drive Residential TIA
Existing Plus Project PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	669	33	66	814	2	14	0	46	3	0	8
Future Volume (veh/h)	5	669	33	66	814	2	14	0	46	3	0	8
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	0.99		0.98	0.99		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	5	719	26	71	875	2	15	0	9	3	0	0
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	626	3179	115	686	3306	8	69	5	19	105	0	0
Arrive On Green	0.92	0.92	0.92	1.00	1.00	1.00	0.03	0.00	0.03	0.03	0.00	0.00
Sat Flow, veh/h	627	3470	125	709	3608	8	787	138	555	1551	0	0
Grp Volume(v), veh/h	5	365	380	71	427	450	24	0	0	3	0	0
Grp Sat Flow(s),veh/h/ln	627	1763	1833	709	1763	1854	1479	0	0	1551	0	0
Q Serve(g_s), s	0.1	3.1	3.1	0.4	0.0	0.0	1.5	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.1	3.1	3.1	3.4	0.0	0.0	2.2	0.0	0.0	0.2	0.0	0.0
Prop In Lane	1.00		0.07	1.00		0.00	0.62		0.37	1.00		0.00
Lane Grp Cap(c), veh/h	626	1615	1679	686	1615	1698	93	0	0	105	0	0
V/C Ratio(X)	0.01	0.23	0.23	0.10	0.26	0.26	0.26	0.00	0.00	0.03	0.00	0.00
Avail Cap(c_a), veh/h	626	1615	1679	686	1615	1698	404	0	0	404	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.92	0.92	0.92	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.5	0.6	0.6	0.0	0.0	0.0	66.3	0.0	0.0	65.4	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.3	0.3	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.1	0.1	0.0	0.0	0.0	0.9	0.0	0.0	0.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.5	0.9	0.9	0.1	0.0	0.0	66.8	0.0	0.0	65.4	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	E	A	A	E	A	A
Approach Vol, veh/h	750			948			24			3		
Approach Delay, s/veh	0.9			0.0			66.8			65.4		
Approach LOS	A			A			E			E		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	132.2			7.8			132.2			7.8		
Change Period (Y+Rc), s	3.9			3.0			3.9			3.0		
Max Green Setting (Gmax), s	98.1			35.0			98.1			35.0		
Max Q Clear Time (g_c+I1), s	5.1			2.2			5.4			4.2		
Green Ext Time (p_c), s	1.4			0.0			1.9			0.0		

Intersection Summary

HCM 6th Ctrl Delay	1.5
HCM 6th LOS	A

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

6: Lance Dr & Guerneville Rd

Lance Drive Residential TIA
Existing Plus Project PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	108	575	11	53	862	225	4	38	37	124	40	64
Future Volume (veh/h)	108	575	11	53	862	225	4	38	37	124	40	64
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.99	0.99		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	112	599	10	55	898	216	4	40	4	129	42	55
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	133	641	11	295	961	418	38	269	25	184	49	62
Arrive On Green	0.15	0.36	0.36	0.11	0.18	0.18	0.17	0.17	0.17	0.17	0.17	0.17
Sat Flow, veh/h	1767	3547	59	1767	3526	1535	60	1601	151	855	289	368
Grp Volume(v), veh/h	112	298	311	55	898	216	48	0	0	226	0	0
Grp Sat Flow(s), veh/h/ln	1767	1763	1843	1767	1763	1535	1812	0	0	1512	0	0
Q Serve(g_s), s	8.6	22.8	22.8	4.0	35.1	17.8	0.0	0.0	0.0	17.2	0.0	0.0
Cycle Q Clear(g_c), s	8.6	22.8	22.8	4.0	35.1	17.8	3.1	0.0	0.0	20.4	0.0	0.0
Prop In Lane	1.00		0.03	1.00		1.00	0.08		0.08	0.57		0.24
Lane Grp Cap(c), veh/h	133	318	333	295	961	418	333	0	0	295	0	0
V/C Ratio(X)	0.84	0.93	0.94	0.19	0.93	0.52	0.14	0.00	0.00	0.77	0.00	0.00
Avail Cap(c_a), veh/h	211	903	944	295	1806	786	494	0	0	430	0	0
HCM Platoon Ratio	2.00	2.00	2.00	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.91	0.91	0.91	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	58.7	43.9	43.9	53.5	56.0	48.9	49.7	0.0	0.0	56.6	0.0	0.0
Incr Delay (d2), s/veh	9.0	5.4	5.3	0.1	15.8	4.1	0.1	0.0	0.0	2.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	8.6	9.0	1.8	18.1	7.5	1.5	0.0	0.0	8.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	67.7	49.4	49.2	53.6	71.8	53.0	49.8	0.0	0.0	59.1	0.0	0.0
LnGrp LOS	E	D	D	D	E	D	D	A	A	E	A	A
Approach Vol, veh/h	721			1169			48			226		
Approach Delay, s/veh	52.1			67.4			49.8			59.1		
Approach LOS	D			E			D			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	28.7	30.6		28.1	15.8	43.5		28.1				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		4.6				
Max Green Setting (Gmax), s	60.3	71.7		36.4	16.7	71.7		36.4				
Max Q Clear Time (g_c+10), s	16.3	24.8		22.4	10.6	37.1		5.1				
Green Ext Time (p_c), s	0.0	0.5		0.3	0.0	1.0		0.0				

Intersection Summary

HCM 6th Ctrl Delay 61.1

HCM 6th LOS E

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

7: N Dutton Ave/Westberry Dr & Guerneville Rd

Lance Drive Residential TIA
Existing Plus Project PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	670	119	440	915	17	191	4	429	6	4	4
Future Volume (veh/h)	3	670	119	440	915	17	191	4	429	6	4	4
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	3	720	122	473	984	17	208	0	123	6	4	0
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	8	764	129	1728	2670	46	256	0	905	25	17	0
Arrive On Green	0.00	0.25	0.25	1.00	1.00	1.00	0.07	0.00	0.07	0.02	0.02	0.00
Sat Flow, veh/h	1767	3004	509	3428	3544	61	3534	0	1559	1081	721	0
Grp Volume(v), veh/h	3	422	420	473	489	512	208	0	123	10	0	0
Grp Sat Flow(s), veh/h/ln	1767	1763	1750	1714	1763	1843	1767	0	1559	1801	0	0
Q Serve(g_s), s	0.2	32.9	32.9	0.0	0.0	0.0	8.1	0.0	0.0	0.8	0.0	0.0
Cycle Q Clear(g_c), s	0.2	32.9	32.9	0.0	0.0	0.0	8.1	0.0	0.0	0.8	0.0	0.0
Prop In Lane	1.00		0.29	1.00		0.03	1.00		1.00	0.60		0.00
Lane Grp Cap(c), veh/h	8	448	445	1728	1328	1388	256	0	905	41	0	0
V/C Ratio(X)	0.36	0.94	0.94	0.27	0.37	0.37	0.81	0.00	0.14	0.24	0.00	0.00
Avail Cap(c_a), veh/h	77	559	555	1728	1328	1388	371	0	956	356	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.96	0.96	0.96	0.71	0.71	0.71	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	69.5	51.2	51.2	0.0	0.0	0.0	64.0	0.0	13.6	67.2	0.0	0.0
Incr Delay (d2), s/veh	9.0	29.5	29.8	0.0	0.6	0.5	5.5	0.0	0.0	1.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	17.9	17.9	0.0	0.2	0.2	3.8	0.0	1.8	0.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	78.5	80.7	81.0	0.0	0.6	0.5	69.4	0.0	13.7	68.3	0.0	0.0
LnGrp LOS	E	F	F	A	A	A	E	A	B	E	A	A
Approach Vol, veh/h	845			1474			331			10		
Approach Delay, s/veh	80.9			0.4			48.7			68.3		
Approach LOS	F			A			D			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	35.8	40.9		7.8	6.0	110.8		15.4				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		5.3				
Max Green Setting (Gmax), s	32.3	44.4		27.7	6.1	71.0		14.7				
Max Q Clear Time (g_c+12.5), s	12.5	34.9		2.8	2.2	2.0		10.1				
Green Ext Time (p_c), s	0.1	0.6		0.0	0.0	0.8		0.0				

Intersection Summary

HCM 6th Ctrl Delay 32.2

HCM 6th LOS C

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 8: Herbert St/Coffey Ln & Guerneville Rd

Lance Drive Residential TIA
Existing Plus Project PM (120-140 Seconds)











Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	163	880	52	48	1143	88	37	20	28	97	23	217
Future Volume (veh/h)	163	880	52	48	1143	88	37	20	28	97	23	217
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.99	1.00		0.93	1.00		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	177	957	54	52	1242	91	40	22	14	105	25	69
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	197	987	56	656	1835	134	76	42	27	158	38	337
Arrive On Green	0.22	0.58	0.58	0.37	0.55	0.55	0.08	0.08	0.08	0.11	0.11	0.11
Sat Flow, veh/h	1767	3383	191	1767	3329	243	907	499	317	1441	343	1480
Grp Volume(v), veh/h	177	499	512	52	657	676	76	0	0	130	0	69
Grp Sat Flow(s), veh/h/ln	1767	1763	1811	1767	1763	1809	1724	0	0	1784	0	1480
Q Serve(g_s), s	13.6	38.0	38.0	2.7	37.3	37.5	5.9	0.0	0.0	9.8	0.0	5.3
Cycle Q Clear(g_c), s	13.6	38.0	38.0	2.7	37.3	37.5	5.9	0.0	0.0	9.8	0.0	5.3
Prop In Lane	1.00		0.11	1.00		0.13	0.53		0.18	0.81		1.00
Lane Grp Cap(c), veh/h	197	514	528	656	972	997	145	0	0	195	0	337
V/C Ratio(X)	0.90	0.97	0.97	0.08	0.68	0.68	0.52	0.00	0.00	0.67	0.00	0.20
Avail Cap(c_a), veh/h	211	742	762	656	972	997	308	0	0	332	0	451
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.87	0.87	0.87	0.79	0.79	0.79	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	53.6	28.6	28.6	28.5	22.5	22.5	61.4	0.0	0.0	59.9	0.0	44.6
Incr Delay (d2), s/veh	29.9	30.3	29.8	0.0	3.0	2.9	1.1	0.0	0.0	1.5	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.9	15.3	15.6	1.1	15.6	16.1	2.7	0.0	0.0	4.5	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	83.5	58.9	58.4	28.5	25.5	25.5	62.5	0.0	0.0	61.3	0.0	44.7
LnGrp LOS	F	E	E	C	C	C	E	A	A	E	A	D
Approach Vol, veh/h	1188			1385			76			199		
Approach Delay, s/veh	62.3			25.6			62.5			55.6		
Approach LOS	E			C			E			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	57.3	46.1		20.2	20.9	82.5		16.4				
Change Period (Y+Rc), s	5.3	5.3		4.9	5.3	5.3		4.6				
Max Green Setting (Gmax), s	58.9	58.9		26.1	16.7	52.1		25.0				
Max Q Clear Time (g_c+14), s	40.0	40.0		11.8	15.6	39.5		7.9				
Green Ext Time (p_c), s	0.0	0.8		0.1	0.0	1.1		0.1				
Intersection Summary												
HCM 6th Ctrl Delay	44.0											
HCM 6th LOS	D											

HCM 6th Signalized Intersection Summary

9: Range Ave & Guerneville Rd

Lance Drive Residential TIA
Existing Plus Project PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	145	638	198	81	800	16	271	151	134	83	217	235
Future Volume (veh/h)	145	638	198	81	800	16	271	151	134	83	217	235
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No		No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	151	665	0	84	833	0	174	308	83	86	226	84
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	604	1885		104	888		267	424	112	193	273	98
Arrive On Green	0.68	1.00	0.00	0.06	0.25	0.00	0.15	0.15	0.15	0.04	0.04	0.04
Sat Flow, veh/h	1767	3618	0	1767	3618	0	1767	2810	742	1767	2503	894
Grp Volume(v), veh/h	151	665	0	84	833	0	174	201	190	86	156	154
Grp Sat Flow(s),veh/h/ln	1767	1763	0	1767	1763	0	1767	1856	1697	1767	1763	1635
Q Serve(g_s), s	4.6	0.0	0.0	6.6	32.4	0.0	13.0	14.5	15.0	6.7	12.3	13.1
Cycle Q Clear(g_c), s	4.6	0.0	0.0	6.6	32.4	0.0	13.0	14.5	15.0	6.7	12.3	13.1
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.44	1.00		0.55
Lane Grp Cap(c), veh/h	604	1885		104	888		267	280	256	193	192	178
V/C Ratio(X)	0.25	0.35		0.81	0.94		0.65	0.72	0.74	0.45	0.81	0.86
Avail Cap(c_a), veh/h	604	1885		170	1030		422	443	405	302	301	279
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	0.80	0.80	0.00	0.93	0.93	0.00	1.00	1.00	1.00	0.56	0.56	0.56
Uniform Delay (d), s/veh	15.3	0.0	0.0	65.1	51.3	0.0	56.0	56.6	56.8	63.3	66.1	66.4
Incr Delay (d2), s/veh	0.1	0.4	0.0	5.1	12.7	0.0	1.0	1.3	1.6	0.3	2.6	5.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	0.1	0.0	3.1	15.7	0.0	5.9	6.9	6.6	3.1	6.0	6.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.4	0.4	0.0	70.1	64.0	0.0	57.0	57.9	58.4	63.7	68.6	72.0
LnGrp LOS	B	A		E	E		E	E	E	E	E	E
Approach Vol, veh/h	816		A	917		A	565		396			
Approach Delay, s/veh	3.2			64.6			57.8		68.8			
Approach LOS	A			E			E		E			
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	3.6	80.2		20.6	53.2	40.6		25.7				
Change Period (Y+Rc), s	5.3	5.3		5.3	5.3	5.3		4.6				
Max Green Setting (Gmax), s	3.5	48.7		23.9	21.3	40.9		33.4				
Max Q Clear Time (g_c+1/3), s	10.6	2.0		15.1	6.6	34.4		17.0				
Green Ext Time (p_c), s	0.0	0.8		0.2	0.0	0.9		0.3				

Intersection Summary

HCM 6th Ctrl Delay 45.2

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

10: Guerneville Rd & Steele Wy

Lance Drive Residential TIA
Existing Plus Project PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	739	100	128	816	10	64	34	156	312	48	17
Future Volume (veh/h)	16	739	100	128	816	10	64	34	156	312	48	17
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	16	754	71	131	833	9	50	56	70	353	0	5
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	737	2163	1068	178	887	10	131	138	195	433	0	843
Arrive On Green	0.14	0.20	0.20	0.05	0.25	0.25	0.07	0.07	0.07	0.12	0.00	0.12
Sat Flow, veh/h	1767	3526	1550	3428	3572	39	1767	1856	1528	3534	0	1524
Grp Volume(v), veh/h	16	754	71	131	411	431	50	56	70	353	0	5
Grp Sat Flow(s), veh/h/ln	1767	1763	1550	1714	1763	1848	1767	1856	1528	1767	0	1524
Q Serve(g_s), s	1.1	25.7	4.2	5.3	32.0	32.0	3.8	4.0	5.9	13.6	0.0	0.0
Cycle Q Clear(g_c), s	1.1	25.7	4.2	5.3	32.0	32.0	3.8	4.0	5.9	13.6	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.02	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	737	2163	1068	178	438	459	131	138	195	433	0	843
V/C Ratio(X)	0.02	0.35	0.07	0.73	0.94	0.94	0.38	0.41	0.36	0.82	0.00	0.01
Avail Cap(c_a), veh/h	737	2163	1068	321	656	688	358	376	392	810	0	1005
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.87	0.87	0.87	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	35.7	31.8	15.4	65.4	51.6	51.6	61.7	61.9	56.0	59.9	0.0	14.9
Incr Delay (d2), s/veh	0.0	0.4	0.1	2.2	13.3	12.9	0.7	0.7	0.4	1.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	12.3	2.0	2.4	15.6	16.3	1.7	1.9	2.3	6.2	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.7	32.2	15.6	67.6	64.9	64.5	62.4	62.6	56.4	61.3	0.0	14.9
LnGrp LOS	D	C	B	E	E	E	E	E	E	E	A	B
Approach Vol, veh/h	841			973			176			358		
Approach Delay, s/veh	30.9			65.1			60.1			60.7		
Approach LOS	C			E			E			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	22.2	90.8		22.1	63.3	39.7		15.0				
Change Period (Y+Rc), s	4.9	4.9		4.9	4.9	4.9		4.6				
Max Green Setting (Gmax), s	47.1			32.1	8.1	52.1		28.4				
Max Q Clear Time (g_c+11), s	27.7			15.6	3.1	34.0		7.9				
Green Ext Time (p_c), s	0.0	1.0		0.1	0.0	0.8		0.0				

Intersection Summary

HCM 6th Ctrl Delay 51.8

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

11: Cleveland Ave & Guerneville Rd

Lance Drive Residential TIA
Existing Plus Project PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↑↑↓		↰↱	↑↑	↱	↰	↑↓		↰	↑↓	
Traffic Volume (veh/h)	110	1049	74	302	1235	197	85	130	227	405	340	111
Future Volume (veh/h)	110	1049	74	302	1235	197	85	130	227	405	340	111
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.98	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	115	1093	68	315	1286	129	89	135	68	292	536	99
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	169	1577	98	360	1339	585	422	550	261	340	583	107
Arrive On Green	0.05	0.32	0.32	0.11	0.38	0.38	0.24	0.24	0.24	0.19	0.19	0.19
Sat Flow, veh/h	3428	4866	302	3428	3526	1539	1767	2305	1096	1767	3032	557
Grp Volume(v), veh/h	115	758	403	315	1286	129	89	101	102	292	327	308
Grp Sat Flow(s),veh/h/ln	1714	1689	1792	1714	1763	1539	1767	1763	1638	1767	1856	1734
Q Serve(g_s), s	4.6	27.4	27.4	12.7	49.9	7.9	5.7	6.5	7.1	22.4	24.2	24.4
Cycle Q Clear(g_c), s	4.6	27.4	27.4	12.7	49.9	7.9	5.7	6.5	7.1	22.4	24.2	24.4
Prop In Lane	1.00		0.17	1.00		1.00	1.00		0.67	1.00		0.32
Lane Grp Cap(c), veh/h	169	1095	581	360	1339	585	422	421	391	340	357	333
V/C Ratio(X)	0.68	0.69	0.69	0.87	0.96	0.22	0.21	0.24	0.26	0.86	0.92	0.92
Avail Cap(c_a), veh/h	198	1095	581	487	1438	628	422	421	391	468	492	459
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.53	0.53	0.53	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	65.4	41.2	41.3	61.7	42.4	29.4	42.7	43.1	43.3	54.7	55.4	55.5
Incr Delay (d2), s/veh	4.9	1.6	3.0	5.8	9.2	0.0	1.1	1.4	1.6	8.7	15.2	17.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	11.6	12.5	5.8	23.0	3.0	2.6	3.0	3.1	10.7	12.7	12.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	70.4	42.8	44.3	67.6	51.6	29.4	43.9	44.4	44.9	63.5	70.6	72.7
LnGrp LOS	E	D	D	E	D	C	D	D	D	E	E	E
Approach Vol, veh/h	1276			1730			292			927		
Approach Delay, s/veh	45.8			52.9			44.4			69.0		
Approach LOS	D			D			D			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	50.3			38.3	11.8	58.1		31.8				
Change Period (Y+Rc), s	4.9	4.9		4.9	4.9	4.9		4.9				
Max Green Setting (Gmax), s	45.3			18.1	8.1	57.1		37.1				
Max Q Clear Time (g_c+14), s	29.4			9.1	6.6	51.9		26.4				
Green Ext Time (p_c), s	0.0	1.4		0.1	0.0	1.3		0.5				

Intersection Summary

HCM 6th Ctrl Delay 53.7

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 12: US 101 SB Ramps & Guerneville Rd

Lance Drive Residential TIA
Existing Plus Project PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑					↑	↑	↑
Traffic Volume (veh/h)	0	1152	555	291	1385	0	0	0	0	289	63	363
Future Volume (veh/h)	0	1152	555	291	1385	0	0	0	0	289	63	363
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1856	1856	1856	1856	0				1856	1856	1856
Adj Flow Rate, veh/h	0	1188	247	300	1428	0				344	0	335
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	1455	435	346	1492	0				1799	0	800
Arrive On Green	0.00	0.29	0.29	0.10	0.42	0.00				0.51	0.00	0.51
Sat Flow, veh/h	0	5233	1515	3428	3618	0				3534	0	1572
Grp Volume(v), veh/h	0	1188	247	300	1428	0				344	0	335
Grp Sat Flow(s),veh/h/ln	0	1689	1515	1714	1763	0				1767	0	1572
Q Serve(g_s), s	0.0	30.6	19.4	12.1	55.0	0.0				7.4	0.0	18.6
Cycle Q Clear(g_c), s	0.0	30.6	19.4	12.1	55.0	0.0				7.4	0.0	18.6
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1455	435	346	1492	0				1799	0	800
V/C Ratio(X)	0.00	0.82	0.57	0.87	0.96	0.00				0.19	0.00	0.42
Avail Cap(c_a), veh/h	0	2066	618	541	2118	0				1799	0	800
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.58	0.58	0.76	0.76	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	46.4	42.5	62.0	39.2	0.0				18.7	0.0	21.4
Incr Delay (d2), s/veh	0.0	0.7	0.3	4.4	6.2	0.0				0.2	0.0	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	12.8	7.3	5.4	24.5	0.0				3.0	0.0	7.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	47.1	42.7	66.4	45.4	0.0				18.9	0.0	23.0
LnGrp LOS	A	D	D	E	D	A				B	A	C
Approach Vol, veh/h		1435			1728						679	
Approach Delay, s/veh		46.4			49.0						21.0	
Approach LOS		D			D						C	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	9.0	45.1		75.9		64.1						
Change Period (Y+Rc), s	4.9	4.9		4.6		4.9						
Max Green Setting (Gmax), s	22.5	57.1		46.4		84.1						
Max Q Clear Time (g_c+14, s)	14.1	32.6		20.6		57.0						
Green Ext Time (p_c), s	0.0	1.7		0.1		2.2						

Intersection Summary

HCM 6th Ctrl Delay 43.1
HCM 6th LOS D

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 13: US 101 NB Ramps & Guerneville Rd/Steele Ln

Lance Drive Residential TIA
Existing Plus Project PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↱↱			↰↱↱		↰	↰↱	↰			
Traffic Volume (veh/h)	417	1024	0	0	996	232	680	1	329	0	0	0
Future Volume (veh/h)	417	1024	0	0	996	232	680	1	329	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1856	1856	0	0	1856	1856	1856	1856	1856			
Adj Flow Rate, veh/h	434	1067	0	0	1038	214	781	0	156			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	3	3	0	0	3	3	3	3	3			
Cap, veh/h	1361	2466	0	0	1120	231	823	0	366			
Arrive On Green	0.79	1.00	0.00	0.00	0.27	0.27	0.23	0.00	0.23			
Sat Flow, veh/h	3428	3618	0	0	4358	863	3534	0	1572			
Grp Volume(v), veh/h	434	1067	0	0	836	416	781	0	156			
Grp Sat Flow(s),veh/h/ln	1714	1763	0	0	1689	1676	1767	0	1572			
Q Serve(g_s), s	4.9	0.0	0.0	0.0	33.8	33.8	30.5	0.0	11.8			
Cycle Q Clear(g_c), s	4.9	0.0	0.0	0.0	33.8	33.8	30.5	0.0	11.8			
Prop In Lane	1.00		0.00	0.00		0.51	1.00		1.00			
Lane Grp Cap(c), veh/h	1361	2466	0	0	903	448	823	0	366			
V/C Ratio(X)	0.32	0.43	0.00	0.00	0.93	0.93	0.95	0.00	0.43			
Avail Cap(c_a), veh/h	1361	2466	0	0	1209	600	1247	0	555			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.72	0.72	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	9.2	0.0	0.0	0.0	49.9	50.0	52.9	0.0	45.7			
Incr Delay (d2), s/veh	0.0	0.4	0.0	0.0	8.6	15.3	9.2	0.0	0.3			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	1.6	0.1	0.0	0.0	15.2	15.9	14.2	0.0	4.6			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	9.2	0.4	0.0	0.0	58.5	65.3	62.1	0.0	46.0			
LnGrp LOS	A	A	A	A	E	E	E	A	D			
Approach Vol, veh/h	1501			1252			937					
Approach Delay, s/veh	3.0			60.8			59.4					
Approach LOS	A			E			E					
Timer - Assigned Phs	2			5		6	8					
Phs Duration (G+Y+Rc), s	102.8			60.5		42.3	37.2					
Change Period (Y+Rc), s	4.9			4.9		4.9	4.6					
Max Green Setting (Gmax), s	81.1			26.1		50.1	49.4					
Max Q Clear Time (g_c+I1), s	2.0			6.9		35.8	32.5					
Green Ext Time (p_c), s	1.5			0.1		1.6	0.1					

Intersection Summary

HCM 6th Ctrl Delay	36.9
HCM 6th LOS	D









Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 14: Stony Point Rd/Marlow Rd & W College Ave

Lance Drive Residential TIA
Existing Plus Project PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	76	236	104	215	331	191	153	758	254	152	815	108
Future Volume (veh/h)	76	236	104	215	331	191	153	758	254	152	815	108
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	80	248	66	226	348	133	161	798	134	160	858	105
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	459	326	85	576	461	173	186	921	916	253	944	116
Arrive On Green	0.26	0.12	0.12	0.33	0.18	0.18	0.11	0.26	0.26	0.14	0.30	0.30
Sat Flow, veh/h	1767	2755	716	1767	2495	936	1767	3526	1544	1767	3155	386
Grp Volume(v), veh/h	80	157	157	226	244	237	161	798	134	160	479	484
Grp Sat Flow(s),veh/h/ln	1767	1763	1709	1767	1763	1669	1767	1763	1544	1767	1763	1778
Q Serve(g_s), s	4.9	12.0	12.5	13.8	18.3	18.9	12.6	30.3	2.1	11.9	36.6	36.6
Cycle Q Clear(g_c), s	4.9	12.0	12.5	13.8	18.3	18.9	12.6	30.3	2.1	11.9	36.6	36.6
Prop In Lane	1.00		0.42	1.00		0.56	1.00		1.00	1.00		0.22
Lane Grp Cap(c), veh/h	459	208	202	576	326	308	186	921	916	253	528	532
V/C Ratio(X)	0.17	0.75	0.78	0.39	0.75	0.77	0.87	0.87	0.15	0.63	0.91	0.91
Avail Cap(c_a), veh/h	459	327	317	576	501	474	249	1100	995	274	575	580
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.52	0.52	0.52	1.00	1.00	1.00	0.50	0.50	0.50
Uniform Delay (d), s/veh	40.2	59.7	59.9	36.5	54.0	54.2	61.7	49.4	4.4	56.5	47.2	47.2
Incr Delay (d2), s/veh	0.2	5.4	6.4	0.2	1.8	2.1	21.0	6.5	0.1	2.1	10.1	10.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	5.6	5.7	6.0	8.2	8.0	6.7	13.9	0.8	5.4	17.2	17.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.4	65.1	66.3	36.7	55.8	56.4	82.7	55.9	4.4	58.6	57.3	57.2
LnGrp LOS	D	E	E	D	E	E	F	E	A	E	E	E
Approach Vol, veh/h	394			707			1093			1123		
Approach Delay, s/veh	60.6			49.9			53.5			57.4		
Approach LOS	E			D			D			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	50.9	21.9	20.0	47.2	41.6	31.2	25.3	41.9				
Change Period (Y+Rc), s	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3				
Max Green Setting (Gmax), s	27.4	26.0	19.7	45.7	13.6	39.8	21.7	43.7				
Max Q Clear Time (g_c+11.5), s	14.5	14.5	14.6	38.6	6.9	20.9	13.9	32.3				
Green Ext Time (p_c), s	0.5	1.2	0.2	3.3	0.1	2.6	0.2	4.3				

Intersection Summary

HCM 6th Ctrl Delay 54.9

HCM 6th LOS D

Notes









User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

15: N Dutton Ave & W College Ave

Lance Drive Residential TIA
Existing Plus Project PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	76	558	96	180	747	179	134	340	124	303	499	132
Future Volume (veh/h)	76	558	96	180	747	179	134	340	124	303	499	132
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	79	581	88	188	778	168	140	354	95	316	520	118
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	99	640	97	235	842	182	566	418	110	694	638	144
Arrive On Green	0.06	0.21	0.21	0.13	0.29	0.29	0.32	0.15	0.15	0.39	0.22	0.22
Sat Flow, veh/h	1767	3063	463	1767	2874	621	1767	2744	725	1767	2845	642
Grp Volume(v), veh/h	79	334	335	188	477	469	140	225	224	316	321	317
Grp Sat Flow(s),veh/h/ln	1767	1763	1763	1767	1763	1732	1767	1763	1706	1767	1763	1724
Q Serve(g_s), s	5.7	24.0	24.2	13.4	34.1	34.1	7.6	16.2	16.6	17.2	22.5	22.7
Cycle Q Clear(g_c), s	5.7	24.0	24.2	13.4	34.1	34.1	7.6	16.2	16.6	17.2	22.5	22.7
Prop In Lane	1.00		0.26	1.00		0.36	1.00		0.43	1.00		0.37
Lane Grp Cap(c), veh/h	99	369	368	235	516	507	566	268	260	694	395	387
V/C Ratio(X)	0.80	0.91	0.91	0.80	0.92	0.92	0.25	0.84	0.86	0.46	0.81	0.82
Avail Cap(c_a), veh/h	150	462	462	394	706	694	566	462	448	694	517	505
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.82	0.82	0.82	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	60.6	50.2	50.2	54.7	44.6	44.6	32.6	53.6	53.8	29.2	47.8	47.9
Incr Delay (d2), s/veh	7.1	14.1	14.7	2.4	12.5	12.7	0.1	2.7	3.3	0.2	5.6	6.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	11.9	12.0	6.1	16.5	16.2	3.3	7.3	7.3	7.2	10.3	10.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	67.7	64.2	64.9	57.0	57.0	57.2	32.7	56.3	57.0	29.4	53.4	54.1
LnGrp LOS	E	E	E	E	E	E	C	E	E	C	D	D
Approach Vol, veh/h	748			1134			589			954		
Approach Delay, s/veh	64.9			57.1			51.0			45.7		
Approach LOS	E			E			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	31.2	31.1	44.7	33.1	10.3	42.0	54.0	23.7				
Change Period (Y+Rc), s	3.9	* 3.9	3.0	3.9	3.0	3.9	3.0	3.9				
Max Green Setting (Gmax), s	29.0	* 34	15.0	38.1	11.0	52.1	19.0	34.1				
Max Q Clear Time (g_c+11.5), s	15.4	26.2	9.6	24.7	7.7	36.1	19.2	18.6				
Green Ext Time (p_c), s	0.1	1.0	0.0	1.1	0.0	2.0	0.0	0.8				

Intersection Summary

HCM 6th Ctrl Delay 54.6

HCM 6th LOS D

Notes





User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection

Intersection Delay, s/veh 8.7

Intersection LOS A




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	50	0	62	78	92	0	6	36	76	7	13
Future Vol, veh/h	7	50	0	62	78	92	0	6	36	76	7	13
Peak Hour Factor	0.86	0.86	0.92	0.92	0.86	0.86	0.92	0.92	0.92	0.86	0.92	0.86
Heavy Vehicles, %	3	3	2	2	3	3	2	2	2	3	2	3
Mvmt Flow	8	58	0	67	91	107	0	7	39	88	8	15
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.1	9.1	7.6	8.7
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	12%	27%	79%
Vol Thru, %	14%	88%	34%	7%
Vol Right, %	86%	0%	40%	14%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	42	57	232	96
LT Vol	0	7	62	76
Through Vol	6	50	78	7
RT Vol	36	0	92	13
Lane Flow Rate	46	66	265	111
Geometry Grp	1	1	1	1
Degree of Util (X)	0.054	0.085	0.309	0.149
Departure Headway (Hd)	4.294	4.631	4.202	4.814
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	834	774	856	745
Service Time	2.323	2.655	2.22	2.839
HCM Lane V/C Ratio	0.055	0.085	0.31	0.149
HCM Control Delay	7.6	8.1	9.1	8.7
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.2	0.3	1.3	0.5




HCM 6th TWSC
17: Iroquois St & Project Driveway (1)

Lance Drive Residential TIA
Existing Plus Project PM (120-140 Seconds)

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	5	8	90	87	3
Future Vol, veh/h	1	5	8	90	87	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	5	9	98	95	3
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	213	97	98	0	-	0
Stage 1	97	-	-	-	-	-
Stage 2	116	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	775	959	1495	-	-	-
Stage 1	927	-	-	-	-	-
Stage 2	909	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	770	959	1495	-	-	-
Mov Cap-2 Maneuver	770	-	-	-	-	-
Stage 1	921	-	-	-	-	-
Stage 2	909	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	8.9	0.6		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1495	-	921	-	-	
HCM Lane V/C Ratio	0.006	-	0.007	-	-	
HCM Control Delay (s)	7.4	0	8.9	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	




HCM 6th TWSC
18: Iroquois St & Project Driveway (2)

Lance Drive Residential TIA
Existing Plus Project PM (120-140 Seconds)

Intersection						
Int Delay, s/veh	0.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	6	9	96	90	2
Future Vol, veh/h	2	6	9	96	90	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	7	10	104	98	2
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	223	99	100	0	-	0
Stage 1	99	-	-	-	-	-
Stage 2	124	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	765	957	1493	-	-	-
Stage 1	925	-	-	-	-	-
Stage 2	902	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	760	957	1493	-	-	-
Mov Cap-2 Maneuver	760	-	-	-	-	-
Stage 1	919	-	-	-	-	-
Stage 2	902	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	9	0.6		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1493	-	899	-	-	
HCM Lane V/C Ratio	0.007	-	0.01	-	-	
HCM Control Delay (s)	7.4	0	9	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	




HCM 6th TWSC
19: Project Driveway (3) & Lance Dr

Lance Drive Residential TIA
Existing Plus Project PM (120-140 Seconds)

Intersection						
Int Delay, s/veh	1.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	159	3	43	229	3	27
Future Vol, veh/h	159	3	43	229	3	27
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	173	3	47	249	3	29
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	176	0	518	175
Stage 1	-	-	-	-	175	-
Stage 2	-	-	-	-	343	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1400	-	518	868
Stage 1	-	-	-	-	855	-
Stage 2	-	-	-	-	719	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1400	-	498	868
Mov Cap-2 Maneuver	-	-	-	-	498	-
Stage 1	-	-	-	-	855	-
Stage 2	-	-	-	-	691	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		1.2		9.6	
HCM LOS					A	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	808	-	-	1400	-	
HCM Lane V/C Ratio	0.04	-	-	0.033	-	
HCM Control Delay (s)	9.6	-	-	7.7	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0.1	-	-	0.1	-	

HCM 6th TWSC
20: Guerneville Rd & Project Driveway (4)























Lance Drive Residential TIA
Existing Plus Project PM (120-140 Seconds)

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	9	681	910	20	13	5
Future Vol, veh/h	9	681	910	20	13	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	740	989	22	14	5
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	1011	0	-	0	1390	506
Stage 1	-	-	-	-	1000	-
Stage 2	-	-	-	-	390	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	681	-	-	-	133	512
Stage 1	-	-	-	-	317	-
Stage 2	-	-	-	-	653	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	681	-	-	-	130	512
Mov Cap-2 Maneuver	-	-	-	-	130	-
Stage 1	-	-	-	-	309	-
Stage 2	-	-	-	-	653	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.2	0		29.9		
HCM LOS				D		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	681	-	-	-	164	
HCM Lane V/C Ratio	0.014	-	-	-	0.119	
HCM Control Delay (s)	10.4	0.1	-	-	29.9	
HCM Lane LOS	B	A	-	-	D	
HCM 95th %tile Q(veh)	0	-	-	-	0.4	

HCM 6th Signalized Intersection Summary







1: Marlow Rd & Marlow Ct/W Steele Ln

Lance Drive Residential TIA
Near Term AM (95-120 Seconds)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	10	10	220	10	180	10	520	220	140	500	10
Future Volume (veh/h)	10	10	10	220	10	180	10	520	220	140	500	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		1.00	1.00		0.96	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	12	12	2	265	0	119	12	605	163	163	581	12
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	33	33	6	1652	0	872	25	813	1082	157	1070	22
Arrive On Green	0.04	0.04	0.04	0.47	0.00	0.47	0.01	0.23	0.23	0.09	0.30	0.30
Sat Flow, veh/h	822	822	137	3534	0	1565	1767	3526	1506	1767	3532	73
Grp Volume(v), veh/h	26	0	0	265	0	119	12	605	163	163	290	303
Grp Sat Flow(s),veh/h/ln	1782	0	0	1767	0	1565	1767	1763	1506	1767	1763	1842
Q Serve(g_s), s	1.6	0.0	0.0	4.7	0.0	0.0	0.7	17.5	4.0	9.8	15.1	15.1
Cycle Q Clear(g_c), s	1.6	0.0	0.0	4.7	0.0	0.0	0.7	17.5	4.0	9.8	15.1	15.1
Prop In Lane	0.46		0.08	1.00		1.00	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	72	0	0	1652	0	872	25	813	1082	157	534	558
V/C Ratio(X)	0.36	0.00	0.00	0.16	0.00	0.14	0.49	0.74	0.15	1.04	0.54	0.54
Avail Cap(c_a), veh/h	308	0	0	1652	0	872	80	1026	1173	157	585	611
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.61	0.61	0.61	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.4	0.0	0.0	16.9	0.0	11.7	53.8	39.3	5.6	50.1	32.0	32.0
Incr Delay (d2), s/veh	3.1	0.0	0.0	0.2	0.0	0.3	8.8	1.4	0.0	81.4	0.9	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.0	2.0	0.0	1.4	0.4	7.6	3.7	7.8	6.4	6.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.5	0.0	0.0	17.1	0.0	12.0	62.6	40.7	5.7	131.5	32.8	32.8
LnGrp LOS	D	A	A	B	A	B	E	D	A	F	C	C
Approach Vol, veh/h		26			384			780			756	
Approach Delay, s/veh		54.5			15.5			33.7			54.1	
Approach LOS		D			B			C			D	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		56.0	6.4	38.2		9.3	14.7	30.0				
Change Period (Y+Rc), s		4.6	4.9	4.9		4.9	4.9	4.6				
Max Green Setting (Gmax), s		30.2	5.0	36.5		19.0	9.8	32.0				
Max Q Clear Time (g_c+I1), s		6.7	2.7	17.1		3.6	11.8	19.5				
Green Ext Time (p_c), s		1.3	0.0	3.3		0.1	0.0	3.7				
Intersection Summary												
HCM 6th Ctrl Delay				38.3								
HCM 6th LOS				D								
Notes												
User approved pedestrian interval to be less than phase max green.												
User approved volume balancing among the lanes for turning movement.												






















HCM 6th TWSC
2: Iroquois St/Apple Valley Ln & W Steele Ln

Lance Drive Residential TIA
Near Term AM (95-120 Seconds)

Intersection												
Int Delay, s/veh	5.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	30	370	50	20	310	20	50	10	30	20	10	40
Future Vol, veh/h	30	370	50	20	310	20	50	10	30	20	10	40
Conflicting Peds, #/hr	12	0	24	24	0	12	4	0	4	4	0	4
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	60	-	-	80	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	36	446	60	24	373	24	60	12	36	24	12	48
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	409	0	0	530	0	0	1039	1029	504	1021	1047	401
Stage 1	-	-	-	-	-	-	572	572	-	445	445	-
Stage 2	-	-	-	-	-	-	467	457	-	576	602	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1144	-	-	1032	-	-	208	233	566	214	227	647
Stage 1	-	-	-	-	-	-	503	503	-	590	573	-
Stage 2	-	-	-	-	-	-	574	566	-	501	487	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1131	-	-	1008	-	-	171	213	551	181	207	637
Mov Cap-2 Maneuver	-	-	-	-	-	-	171	213	-	181	207	-
Stage 1	-	-	-	-	-	-	476	476	-	565	553	-
Stage 2	-	-	-	-	-	-	505	546	-	440	461	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.6			0.5			34.1			20.5		
HCM LOS							D			C		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	229	1131	-	-	1008	-	-	316				
HCM Lane V/C Ratio	0.474	0.032	-	-	0.024	-	-	0.267				
HCM Control Delay (s)	34.1	8.3	-	-	8.7	-	-	20.5				
HCM Lane LOS	D	A	-	-	A	-	-	C				
HCM 95th %tile Q(veh)	2.3	0.1	-	-	0.1	-	-	1.1				

HCM 6th Signalized Intersection Summary 3: Range Ave & W Steele Ln

Lance Drive Residential TIA
Near Term AM (95-120 Seconds)











												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	420	60	50	280	40	40	170	30	30	150	30
Future Volume (veh/h)	40	420	60	50	280	40	40	170	30	30	150	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.95	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	45	477	66	57	318	43	45	193	20	34	170	18
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	730	1144	158	586	1145	155	65	422	43	55	434	45
Arrive On Green	0.72	0.72	0.72	0.72	0.72	0.72	0.04	0.13	0.13	0.03	0.14	0.14
Sat Flow, veh/h	1011	1594	221	855	1597	216	1767	3212	328	1767	3203	334
Grp Volume(v), veh/h	45	0	543	57	0	361	45	105	108	34	92	96
Grp Sat Flow(s),veh/h/ln	1011	0	1815	855	0	1812	1767	1763	1778	1767	1763	1774
Q Serve(g_s), s	1.6	0.0	11.5	2.7	0.0	6.7	2.4	5.2	5.4	1.8	4.5	4.7
Cycle Q Clear(g_c), s	8.2	0.0	11.5	14.2	0.0	6.7	2.4	5.2	5.4	1.8	4.5	4.7
Prop In Lane	1.00		0.12	1.00		0.12	1.00		0.18	1.00		0.19
Lane Grp Cap(c), veh/h	730	0	1302	586	0	1300	65	232	234	55	239	240
V/C Ratio(X)	0.06	0.00	0.42	0.10	0.00	0.28	0.70	0.45	0.46	0.62	0.39	0.40
Avail Cap(c_a), veh/h	730	0	1302	586	0	1300	149	466	470	149	466	469
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.79	0.79	0.79	1.00	1.00	1.00
Uniform Delay (d), s/veh	6.2	0.0	5.4	8.3	0.0	4.7	45.2	38.1	38.2	45.5	37.5	37.5
Incr Delay (d2), s/veh	0.2	0.0	1.0	0.3	0.0	0.5	3.9	0.4	0.4	4.1	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	3.7	0.5	0.0	2.2	1.1	2.2	2.3	0.8	1.9	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	6.4	0.0	6.4	8.6	0.0	5.3	49.2	38.5	38.6	49.6	37.8	37.9
LnGrp LOS	A	A	A	A	A	A	D	D	D	D	D	D
Approach Vol, veh/h		588			418			258			222	
Approach Delay, s/veh		6.4			5.7			40.4			39.7	
Approach LOS		A			A			D			D	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		71.8	6.5	16.8		71.8	6.9	16.4				
Change Period (Y+Rc), s		3.6	3.0	3.9		3.6	3.9	* 3.9				
Max Green Setting (Gmax), s		51.4	8.0	25.1		51.4	8.0	* 25				
Max Q Clear Time (g_c+I1), s		13.5	4.4	6.7		16.2	3.8	7.4				
Green Ext Time (p_c), s		1.2	0.0	0.3		0.9	0.0	0.3				
Intersection Summary												
HCM 6th Ctrl Delay			17.1									
HCM 6th LOS			B									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

HCM 6th Signalized Intersection Summary

4: Marlow Rd & Guerneville Rd

Lance Drive Residential TIA
Near Term AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	120	440	150	150	280	100	130	480	170	110	500	90
Future Volume (veh/h)	120	440	150	150	280	100	130	480	170	110	500	90
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	130	478	97	163	304	83	141	522	62	120	543	84
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	160	670	433	169	547	147	154	692	453	217	707	109
Arrive On Green	0.09	0.19	0.19	0.10	0.20	0.20	0.09	0.20	0.20	0.12	0.23	0.23
Sat Flow, veh/h	1767	3526	1558	1767	2742	736	1767	3526	1540	1767	3052	470
Grp Volume(v), veh/h	130	478	97	163	193	194	141	522	62	120	313	314
Grp Sat Flow(s),veh/h/ln	1767	1763	1558	1767	1763	1715	1767	1763	1540	1767	1763	1759
Q Serve(g_s), s	6.9	12.1	1.8	8.7	9.4	9.7	7.5	13.3	0.0	6.1	15.7	15.9
Cycle Q Clear(g_c), s	6.9	12.1	1.8	8.7	9.4	9.7	7.5	13.3	0.0	6.1	15.7	15.9
Prop In Lane	1.00		1.00	1.00		0.43	1.00		1.00	1.00		0.27
Lane Grp Cap(c), veh/h	160	670	433	169	352	342	154	692	453	217	408	407
V/C Ratio(X)	0.81	0.71	0.22	0.96	0.55	0.57	0.91	0.75	0.14	0.55	0.77	0.77
Avail Cap(c_a), veh/h	177	965	564	169	475	462	154	1065	616	217	557	556
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.99	0.99	0.99	0.61	0.61	0.61	0.90	0.90	0.90
Uniform Delay (d), s/veh	42.4	36.1	5.4	42.8	34.2	34.3	43.0	36.0	24.8	39.2	34.1	34.1
Incr Delay (d2), s/veh	22.6	1.4	0.3	57.7	6.0	6.6	34.4	1.0	0.1	2.8	3.9	4.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	5.1	1.2	6.4	4.5	4.5	4.7	5.6	1.0	2.7	7.0	7.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	65.1	37.5	5.7	100.5	40.2	40.9	77.4	37.0	24.9	42.0	38.0	38.3
LnGrp LOS	E	D	A	F	D	D	E	D	C	D	D	D
Approach Vol, veh/h	705				550				725		747	
Approach Delay, s/veh	38.2				58.3				43.8		38.8	
Approach LOS	D				E				D		D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	4.8	23.7	13.6	27.3	13.9	24.7	16.9	24.0				
Change Period (Y+Rc), s	5.7	* 5.7	5.3	5.3	5.3	5.7	5.3	5.3				
Max Green Setting (Gmax), s	26	* 26	8.3	30.0	9.5	25.6	9.6	28.7				
Max Q Clear Time (g_c+110, s)	14.1	14.1	9.5	17.9	8.9	11.7	8.1	15.3				
Green Ext Time (p_c), s	0.0	2.6	0.0	3.0	0.0	1.8	0.0	2.9				

Intersection Summary

HCM 6th Ctrl Delay 43.9
HCM 6th LOS D

Notes






User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary 5: Ridley Ave & Guerneville Rd

Lance Drive Residential TIA
Near Term AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	700	30	60	440	20	40	10	60	40	10	30
Future Volume (veh/h)	30	700	30	60	440	20	40	10	60	40	10	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	0.98		0.97	0.98		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No		No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	34	787	33	67	494	21	45	11	19	45	11	9
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	799	2841	119	587	2842	121	142	38	40	164	39	22
Arrive On Green	0.82	0.82	0.82	1.00	1.00	1.00	0.10	0.10	0.10	0.10	0.10	0.10
Sat Flow, veh/h	877	3444	144	661	3445	146	793	372	395	977	380	218
Grp Volume(v), veh/h	34	403	417	67	252	263	75	0	0	65	0	0
Grp Sat Flow(s),veh/h/ln	877	1763	1825	661	1763	1828	1560	0	0	1576	0	0
Q Serve(g_s), s	0.7	4.9	4.9	0.7	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.7	4.9	4.9	5.6	0.0	0.0	3.9	0.0	0.0	3.2	0.0	0.0
Prop In Lane	1.00		0.08	1.00		0.08	0.60		0.25	0.69		0.14
Lane Grp Cap(c), veh/h	799	1454	1506	587	1454	1508	220	0	0	225	0	0
V/C Ratio(X)	0.04	0.28	0.28	0.11	0.17	0.17	0.34	0.00	0.00	0.29	0.00	0.00
Avail Cap(c_a), veh/h	799	1454	1506	587	1454	1508	592	0	0	593	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.92	0.92	0.92	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	1.5	1.9	1.9	0.2	0.0	0.0	40.0	0.0	0.0	39.7	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.4	0.4	0.0	0.0	0.0	0.3	0.0	0.0	0.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.8	0.9	0.0	0.0	0.0	1.7	0.0	0.0	1.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	1.6	2.3	2.3	0.2	0.0	0.0	40.3	0.0	0.0	40.0	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	D	A	A	D	A	A
Approach Vol, veh/h	854				582		75				65	
Approach Delay, s/veh	2.3				0.0		40.3				40.0	
Approach LOS	A				A		D				D	
Timer - Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	82.3		12.7		82.3		12.7					
Change Period (Y+Rc), s	3.9		3.0		3.9		3.0					
Max Green Setting (Gmax), s	54.1		34.0		54.1		34.0					
Max Q Clear Time (g_c+I1), s	6.9		5.2		7.6		5.9					
Green Ext Time (p_c), s	1.6		0.2		1.2		0.2					
Intersection Summary												
HCM 6th Ctrl Delay			4.8									
HCM 6th LOS			A									

HCM 6th Signalized Intersection Summary

6: Lance Dr & Guerneville Rd

Lance Drive Residential TIA
Near Term AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	750	30	30	440	50	20	50	70	60	80	60
Future Volume (veh/h)	30	750	30	30	440	50	20	50	70	60	80	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.99	0.99		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	36	893	35	36	524	40	24	60	47	71	95	56
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	68	984	39	80	1027	447	76	154	103	125	135	71
Arrive On Green	0.01	0.09	0.09	0.01	0.10	0.10	0.17	0.17	0.17	0.17	0.17	0.17
Sat Flow, veh/h	1767	3455	135	1767	3526	1536	183	905	609	439	793	415
Grp Volume(v), veh/h	36	456	472	36	524	40	131	0	0	222	0	0
Grp Sat Flow(s), veh/h/ln	1767	1763	1827	1767	1763	1536	1697	0	0	1647	0	0
Q Serve(g_s), s	1.9	24.3	24.3	1.9	13.4	2.3	0.0	0.0	0.0	5.6	0.0	0.0
Cycle Q Clear(g_c), s	1.9	24.3	24.3	1.9	13.4	2.3	6.4	0.0	0.0	12.0	0.0	0.0
Prop In Lane	1.00		0.07	1.00		1.00	0.18		0.36	0.32		0.25
Lane Grp Cap(c), veh/h	68	502	520	80	1027	447	333	0	0	330	0	0
V/C Ratio(X)	0.53	0.91	0.91	0.45	0.51	0.09	0.39	0.00	0.00	0.67	0.00	0.00
Avail Cap(c_a), veh/h	125	737	764	143	1510	658	606	0	0	595	0	0
HCM Platoon Ratio	0.33	0.33	0.33	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.97	0.97	0.97	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	46.0	41.8	41.8	45.6	36.5	31.4	35.4	0.0	0.0	37.5	0.0	0.0
Incr Delay (d2), s/veh	2.3	8.7	8.4	1.4	1.8	0.4	0.3	0.0	0.0	0.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	12.6	13.0	0.9	6.5	0.9	2.8	0.0	0.0	5.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.3	50.5	50.2	47.1	38.3	31.8	35.7	0.0	0.0	38.4	0.0	0.0
LnGrp LOS	D	D	D	D	D	C	D	A	A	D	A	A
Approach Vol, veh/h	964			600			131			222		
Approach Delay, s/veh	50.3			38.4			35.7			38.4		
Approach LOS	D			D			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.6	32.4		20.7	9.0	33.0		20.7				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		4.6				
Max Green Setting (Gmax), s	39.7	39.7		32.4	6.7	40.7		32.4				
Max Q Clear Time (g_c+13.9)	26.3	26.3		14.0	3.9	15.4		8.4				
Green Ext Time (p_c), s	0.0	0.7		0.3	0.0	0.6		0.2				

Intersection Summary

HCM 6th Ctrl Delay 44.2

HCM 6th LOS D

Notes









User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

7: N Dutton Ave/Westberry Dr & Guerneville Rd

Lance Drive Residential TIA
Near Term AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	850	110	250	460	10	90	10	380	20	10	10
Future Volume (veh/h)	10	850	110	250	460	10	90	10	380	20	10	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	12	1024	127	301	554	11	117	0	147	24	12	5
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	30	1054	131	1180	2338	46	189	0	625	53	27	11
Arrive On Green	0.02	0.33	0.33	0.34	0.66	0.66	0.05	0.00	0.05	0.05	0.05	0.05
Sat Flow, veh/h	1767	3149	390	3428	3533	70	3534	0	1564	1030	515	215
Grp Volume(v), veh/h	12	573	578	301	276	289	117	0	147	41	0	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1776	1714	1763	1841	1767	0	1564	1760	0	0
Q Serve(g_s), s	0.6	30.4	30.5	6.0	6.0	6.0	3.1	0.0	0.0	2.1	0.0	0.0
Cycle Q Clear(g_c), s	0.6	30.4	30.5	6.0	6.0	6.0	3.1	0.0	0.0	2.1	0.0	0.0
Prop In Lane	1.00		0.22	1.00		0.04	1.00		1.00	0.59		0.12
Lane Grp Cap(c), veh/h	30	590	595	1180	1167	1218	189	0	625	91	0	0
V/C Ratio(X)	0.40	0.97	0.97	0.26	0.24	0.24	0.62	0.00	0.24	0.45	0.00	0.00
Avail Cap(c_a), veh/h	112	590	595	1180	1167	1218	190	0	625	513	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.91	0.91	0.91	0.94	0.94	0.94	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	46.2	31.1	31.2	22.4	6.4	6.4	44.0	0.0	19.0	43.7	0.0	0.0
Incr Delay (d2), s/veh	2.8	28.9	29.0	0.0	0.4	0.4	4.5	0.0	0.1	1.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	16.8	17.0	2.3	2.0	2.1	1.4	0.0	2.0	1.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.0	60.0	60.2	22.4	6.9	6.9	48.5	0.0	19.1	45.0	0.0	0.0
LnGrp LOS	D	E	E	C	A	A	D	A	B	D	A	A
Approach Vol, veh/h	1163		866				264		41			
Approach Delay, s/veh	60.0		12.3				32.1		45.0			
Approach LOS	E		B				C		D			
Timer - Assigned Phs	1	2	4		5	6	8					
Phs Duration (G+Y+Rc), s	38.0	37.1	9.5		6.9	68.2	10.4					
Change Period (Y+Rc), s	5.3	5.3	4.6		5.3	5.3	5.3					
Max Green Setting (Gmax), s	31.8	31.8	27.7		6.0	35.7	5.1					
Max Q Clear Time (g_c+1/3), s	32.5	32.5	4.1		2.6	8.0	5.1					
Green Ext Time (p_c), s	0.0	0.0	0.0		0.0	0.4	0.0					

Intersection Summary

HCM 6th Ctrl Delay 38.9

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

8: Herbert St/Coffey Ln & Guerneville Rd

Lance Drive Residential TIA
Near Term AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	140	1080	30	20	530	40	20	20	20	80	10	160
Future Volume (veh/h)	140	1080	30	20	530	40	20	20	20	80	10	160
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		0.95	1.00		0.94	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	163	1256	34	23	616	44	23	23	6	93	12	53
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	190	1178	32	587	1865	133	50	50	13	146	19	310
Arrive On Green	0.11	0.34	0.34	0.33	0.56	0.56	0.06	0.06	0.06	0.09	0.09	0.09
Sat Flow, veh/h	1767	3501	95	1767	3325	237	780	780	204	1574	203	1510
Grp Volume(v), veh/h	163	632	658	23	326	334	52	0	0	105	0	53
Grp Sat Flow(s),veh/h/ln	1767	1763	1832	1767	1763	1800	1764	0	0	1777	0	1510
Q Serve(g_s), s	10.4	38.7	38.7	1.0	11.5	11.5	3.3	0.0	0.0	6.6	0.0	3.3
Cycle Q Clear(g_c), s	10.4	38.7	38.7	1.0	11.5	11.5	3.3	0.0	0.0	6.6	0.0	3.3
Prop In Lane	1.00		0.05	1.00		0.13	0.44		0.12	0.89		1.00
Lane Grp Cap(c), veh/h	190	593	617	587	989	1009	112	0	0	165	0	310
V/C Ratio(X)	0.86	1.07	1.07	0.04	0.33	0.33	0.46	0.00	0.00	0.63	0.00	0.17
Avail Cap(c_a), veh/h	272	593	617	587	989	1009	383	0	0	403	0	512
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.75	0.75	0.75	0.94	0.94	0.94	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	50.4	38.1	38.2	26.0	13.6	13.6	51.9	0.0	0.0	50.3	0.0	38.1
Incr Delay (d2), s/veh	9.7	50.9	50.8	0.0	0.8	0.8	1.1	0.0	0.0	1.5	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.0	24.3	25.3	0.4	4.5	4.6	1.5	0.0	0.0	3.0	0.0	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.1	89.1	89.0	26.0	14.4	14.4	53.0	0.0	0.0	51.8	0.0	38.2
LnGrp LOS	E	F	F	C	B	B	D	A	A	D	A	D
Approach Vol, veh/h	1453			683			52			158		
Approach Delay, s/veh	85.8			14.8			53.0			47.2		
Approach LOS	F			B			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	43.5	44.0		15.6	17.7	69.8		11.9				
Change Period (Y+Rc), s	5.3	5.3		4.9	5.3	5.3		4.6				
Max Green Setting (Gmax), s	5.3	38.7		26.1	17.7	26.1		25.0				
Max Q Clear Time (g_c+1/3), s	13.6	40.7		8.6	12.4	13.5		5.3				
Green Ext Time (p_c), s	0.0	0.0		0.1	0.0	0.5		0.0				
Intersection Summary												
HCM 6th Ctrl Delay	61.8											
HCM 6th LOS	E											

HCM 6th Signalized Intersection Summary

9: Range Ave & Guerneville Rd

Lance Drive Residential TIA
Near Term AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	150	710	150	70	410	10	130	90	80	40	100	110
Future Volume (veh/h)	150	710	150	70	410	10	130	90	80	40	100	110
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.96	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	160	755	0	74	436	0	81	176	8	43	106	17
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	232	861		96	590		169	336	15	129	221	34
Arrive On Green	0.13	0.24	0.00	0.05	0.17	0.00	0.10	0.10	0.10	0.07	0.07	0.07
Sat Flow, veh/h	1767	3618	0	1767	3618	0	1767	3517	159	1767	3034	474
Grp Volume(v), veh/h	160	755	0	74	436	0	81	92	92	43	60	63
Grp Sat Flow(s),veh/h/ln	1767	1763	0	1767	1763	0	1767	1856	1820	1767	1763	1745
Q Serve(g_s), s	8.2	19.6	0.0	3.9	11.2	0.0	4.1	4.5	4.6	2.2	3.1	3.3
Cycle Q Clear(g_c), s	8.2	19.6	0.0	3.9	11.2	0.0	4.1	4.5	4.6	2.2	3.1	3.3
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.09	1.00		0.27
Lane Grp Cap(c), veh/h	232	861		96	590		169	177	174	129	128	127
V/C Ratio(X)	0.69	0.88		0.77	0.74		0.48	0.52	0.53	0.33	0.47	0.49
Avail Cap(c_a), veh/h	232	1058		112	1058		614	645	632	130	130	129
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.79	0.79	0.00	0.97	0.97	0.00	1.00	1.00	1.00	0.86	0.86	0.86
Uniform Delay (d), s/veh	39.4	34.5	0.0	44.3	37.6	0.0	40.7	40.9	40.9	41.9	42.3	42.4
Incr Delay (d2), s/veh	5.7	5.1	0.0	19.7	7.9	0.0	0.8	0.9	0.9	0.5	0.9	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.8	8.6	0.0	2.2	5.3	0.0	1.8	2.1	2.1	0.9	1.4	1.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.1	39.6	0.0	64.1	45.5	0.0	41.5	41.8	41.9	42.3	43.1	43.3
LnGrp LOS	D	D		E	D		D	D	D	D	D	D
Approach Vol, veh/h	915		A	510		A	265			166		
Approach Delay, s/veh	40.6			48.2			41.7			43.0		
Approach LOS	D			D			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	28.5			12.2	17.8	21.2		13.7				
Change Period (Y+Rc), s	5.3	5.3		5.3	5.3	5.3		4.6				
Max Green Setting (Gmax), s	28.5			7.0	6.0	28.5		33.0				
Max Q Clear Time (g_c+15), s	21.6			5.3	10.2	13.2		6.6				
Green Ext Time (p_c), s	0.0	0.7		0.0	0.0	0.5		0.1				

Intersection Summary

HCM 6th Ctrl Delay 43.0

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

10: Guerneville Rd & Steele Wy

Lance Drive Residential TIA
Near Term AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	760	50	60	450	10	30	10	60	390	20	10
Future Volume (veh/h)	30	760	50	60	450	10	30	10	60	390	20	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	34	864	37	68	511	10	22	27	6	459	0	5
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	795	1954	961	218	593	12	102	107	190	526	0	941
Arrive On Green	0.45	0.55	0.55	0.06	0.17	0.17	0.06	0.06	0.06	0.15	0.00	0.15
Sat Flow, veh/h	1767	3526	1571	3428	3534	69	1767	1856	1558	3534	0	1566
Grp Volume(v), veh/h	34	864	37	68	255	266	22	27	6	459	0	5
Grp Sat Flow(s), veh/h/ln	1767	1763	1571	1714	1763	1841	1767	1856	1558	1767	0	1566
Q Serve(g_s), s	1.2	15.9	1.0	2.1	15.5	15.5	1.3	1.5	0.4	14.0	0.0	0.0
Cycle Q Clear(g_c), s	1.2	15.9	1.0	2.1	15.5	15.5	1.3	1.5	0.4	14.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.04	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	795	1954	961	218	296	309	102	107	190	526	0	941
V/C Ratio(X)	0.04	0.44	0.04	0.31	0.86	0.86	0.22	0.25	0.03	0.87	0.00	0.01
Avail Cap(c_a), veh/h	795	1954	961	218	476	497	434	455	482	868	0	1092
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.88	0.88	0.88	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.0	14.5	8.5	49.2	44.5	44.5	49.4	49.6	42.6	45.8	0.0	8.9
Incr Delay (d2), s/veh	0.0	0.6	0.1	0.3	5.0	4.9	0.4	0.5	0.0	3.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	6.2	0.4	0.9	7.1	7.4	0.6	0.7	0.1	6.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.0	15.1	8.5	49.5	49.6	49.5	49.8	50.0	42.6	48.7	0.0	8.9
LnGrp LOS	B	B	A	D	D	D	D	D	D	D	A	A
Approach Vol, veh/h	935			589			55			464		
Approach Delay, s/veh	14.9			49.5			49.1			48.3		
Approach LOS	B			D			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	1.9	65.9		21.3	54.4	23.4		10.9				
Change Period (Y+Rc), s	4.9	4.9		4.9	4.9	4.9		4.6				
Max Green Setting (Gmax), s	29.7	29.7		27.0	7.0	29.7		27.0				
Max Q Clear Time (g_c+14), s	17.9	17.9		16.0	3.2	17.5		3.5				
Green Ext Time (p_c), s	0.0	1.1		0.1	0.0	0.4		0.0				

Intersection Summary

HCM 6th Ctrl Delay 33.4

HCM 6th LOS C

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

11: Cleveland Ave & Guerneville Rd

Lance Drive Residential TIA
Near Term AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↑↑↓		↰↱	↑↑	↱	↰	↑↓		↰	↑↓	
Traffic Volume (veh/h)	60	1150	40	180	820	190	30	90	150	230	70	40
Future Volume (veh/h)	60	1150	40	180	820	190	30	90	150	230	70	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	66	1264	41	198	901	109	33	99	58	253	77	28
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	246	1383	45	266	989	431	593	734	399	375	137	50
Arrive On Green	0.07	0.27	0.27	0.05	0.19	0.19	0.34	0.34	0.34	0.11	0.11	0.11
Sat Flow, veh/h	3428	5036	163	3428	3526	1536	1767	2190	1189	3534	1292	470
Grp Volume(v), veh/h	66	848	457	198	901	109	33	78	79	253	0	105
Grp Sat Flow(s), veh/h/ln	1714	1689	1822	1714	1763	1536	1767	1763	1616	1767	0	1761
Q Serve(g_s), s	1.7	23.1	23.1	5.4	23.8	5.7	1.2	2.9	3.2	6.5	0.0	5.4
Cycle Q Clear(g_c), s	1.7	23.1	23.1	5.4	23.8	5.7	1.2	2.9	3.2	6.5	0.0	5.4
Prop In Lane	1.00		0.09	1.00		1.00	1.00		0.74	1.00		0.27
Lane Grp Cap(c), veh/h	246	927	500	266	989	431	593	591	542	375	0	187
V/C Ratio(X)	0.27	0.91	0.91	0.74	0.91	0.25	0.06	0.13	0.15	0.67	0.00	0.56
Avail Cap(c_a), veh/h	253	1034	558	328	1158	504	593	591	542	1008	0	502
HCM Platoon Ratio	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.77	0.77	0.77	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	41.7	33.4	33.4	44.1	37.4	30.1	21.4	22.0	22.1	40.9	0.0	40.4
Incr Delay (d2), s/veh	0.2	10.8	17.6	3.9	7.2	0.1	0.2	0.5	0.6	0.8	0.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	10.5	12.2	2.4	11.5	2.1	0.5	1.3	1.3	2.8	0.0	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.9	44.2	51.0	48.0	44.6	30.2	21.6	22.4	22.6	41.7	0.0	41.3
LnGrp LOS	D	D	D	D	D	C	C	C	C	D	A	D
Approach Vol, veh/h	1371			1208			190			358		
Approach Delay, s/veh	46.3			43.9			22.4			41.6		
Approach LOS	D			D			C			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	2.3	31.0		36.8	11.7	31.5		15.0				
Change Period (Y+Rc), s	4.9	4.9		4.9	4.9	4.9		4.9				
Max Green Setting (Gmax), s	29.1			10.1	7.0	31.2		27.1				
Max Q Clear Time (g_c+11), s	25.1			5.2	3.7	25.8		8.5				
Green Ext Time (p_c), s	0.0	1.0		0.1	0.0	0.9		0.1				

Intersection Summary

HCM 6th Ctrl Delay	43.4
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.
User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 12: US 101 SB Ramps & Guerneville Rd

Lance Drive Residential TIA
Near Term AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑					↑	↑	↑
Traffic Volume (veh/h)	0	1020	500	260	900	0	0	0	0	350	10	280
Future Volume (veh/h)	0	1020	500	260	900	0	0	0	0	350	10	280
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1856	1856	1856	1856	0				1856	1856	1856
Adj Flow Rate, veh/h	0	1146	152	292	1011	0				401	0	258
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89				0.89	0.89	0.89
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	1295	395	359	1452	0				1725	0	768
Arrive On Green	0.00	0.26	0.26	0.10	0.41	0.00				0.49	0.00	0.49
Sat Flow, veh/h	0	5233	1544	3428	3618	0				3534	0	1572
Grp Volume(v), veh/h	0	1146	152	292	1011	0				401	0	258
Grp Sat Flow(s),veh/h/ln	0	1689	1544	1714	1763	0				1767	0	1572
Q Serve(g_s), s	0.0	20.7	7.7	7.9	22.5	0.0				6.2	0.0	9.5
Cycle Q Clear(g_c), s	0.0	20.7	7.7	7.9	22.5	0.0				6.2	0.0	9.5
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1295	395	359	1452	0				1725	0	768
V/C Ratio(X)	0.00	0.89	0.39	0.81	0.70	0.00				0.23	0.00	0.34
Avail Cap(c_a), veh/h	0	1925	587	545	2082	0				1725	0	768
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.33	0.33	0.81	0.81	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	34.0	29.2	41.6	23.0	0.0				14.0	0.0	14.9
Incr Delay (d2), s/veh	0.0	0.9	0.1	2.5	0.2	0.0				0.3	0.0	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	8.3	2.8	3.4	8.8	0.0				2.3	0.0	3.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	34.9	29.3	44.1	23.2	0.0				14.4	0.0	16.1
LnGrp LOS	A	C	C	D	C	A				B	A	B
Approach Vol, veh/h		1298			1303						659	
Approach Delay, s/veh		34.2			27.9						15.0	
Approach LOS		C			C						B	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	4.8	29.2		51.0		44.0						
Change Period (Y+Rc), s	4.9	4.9		4.6		4.9						
Max Green Setting (Gmax), s	5.5	36.1		29.4		56.1						
Max Q Clear Time (g_c+19), s	19.5	22.7		11.5		24.5						
Green Ext Time (p_c), s	0.0	1.6		0.1		1.4						

Intersection Summary

HCM 6th Ctrl Delay	27.8
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 13: US 101 NB Ramps & Guerneville Rd/Steele Ln

Lance Drive Residential TIA
Near Term AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗↘	↑↑			↑↑↑		↗	↔	↗			
Traffic Volume (veh/h)	380	990	0	0	800	210	360	10	420	0	0	0
Future Volume (veh/h)	380	990	0	0	800	210	360	10	420	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1856	1856	0	0	1856	1856	1856	1856	1856			
Adj Flow Rate, veh/h	427	1112	0	0	899	207	515	0	231			
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89			
Percent Heavy Veh, %	3	3	0	0	3	3	3	3	3			
Cap, veh/h	1491	2589	0	0	1015	233	585	0	260			
Arrive On Green	0.87	1.00	0.00	0.00	0.25	0.25	0.17	0.00	0.17			
Sat Flow, veh/h	3428	3618	0	0	4264	938	3534	0	1572			
Grp Volume(v), veh/h	427	1112	0	0	740	366	515	0	231			
Grp Sat Flow(s),veh/h/ln	1714	1763	0	0	1689	1658	1767	0	1572			
Q Serve(g_s), s	2.0	0.0	0.0	0.0	20.1	20.2	13.5	0.0	13.6			
Cycle Q Clear(g_c), s	2.0	0.0	0.0	0.0	20.1	20.2	13.5	0.0	13.6			
Prop In Lane	1.00		0.00	0.00		0.57	1.00		1.00			
Lane Grp Cap(c), veh/h	1491	2589	0	0	837	411	585	0	260			
V/C Ratio(X)	0.29	0.43	0.00	0.00	0.88	0.89	0.88	0.00	0.89			
Avail Cap(c_a), veh/h	1491	2589	0	0	1177	578	1094	0	487			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.59	0.59	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	3.6	0.0	0.0	0.0	34.4	34.5	38.7	0.0	38.8			
Incr Delay (d2), s/veh	0.0	0.3	0.0	0.0	4.8	9.7	1.7	0.0	4.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.6	0.1	0.0	0.0	8.5	9.0	5.7	0.0	5.3			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	3.6	0.3	0.0	0.0	39.2	44.1	40.5	0.0	42.8			
LnGrp LOS	A	A	A	A	D	D	D	A	D			
Approach Vol, veh/h	1539			1106			746					
Approach Delay, s/veh	1.2			40.8			41.2					
Approach LOS	A			D			D					
Timer - Assigned Phs	2			5			6			8		
Phs Duration (G+Y+Rc), s	74.7			46.2			28.4			20.3		
Change Period (Y+Rc), s	4.9			4.9			4.9			4.6		
Max Green Setting (Gmax), s	56.1			18.1			33.1			29.4		
Max Q Clear Time (g_c+I1), s	2.0			4.0			22.2			15.6		
Green Ext Time (p_c), s	1.6			0.1			1.3			0.1		

Intersection Summary

HCM 6th Ctrl Delay	22.9
HCM 6th LOS	C










Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 14: Stony Point Rd/Marlow Rd & W College Ave

Lance Drive Residential TIA
Near Term AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	370	150	160	200	130	80	580	160	180	560	70
Future Volume (veh/h)	90	370	150	160	200	130	80	580	160	180	560	70
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	100	411	129	178	222	50	89	644	95	200	622	71
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	339	532	165	406	687	152	113	783	703	218	895	102
Arrive On Green	0.19	0.20	0.20	0.23	0.24	0.24	0.06	0.22	0.22	0.12	0.28	0.28
Sat Flow, veh/h	1767	2635	817	1767	2868	633	1767	3526	1538	1767	3182	363
Grp Volume(v), veh/h	100	273	267	178	135	137	89	644	95	200	344	349
Grp Sat Flow(s),veh/h/ln	1767	1763	1690	1767	1763	1738	1767	1763	1538	1767	1763	1781
Q Serve(g_s), s	4.6	13.9	14.2	8.2	6.0	6.2	4.7	16.5	1.6	10.6	16.6	16.6
Cycle Q Clear(g_c), s	4.6	13.9	14.2	8.2	6.0	6.2	4.7	16.5	1.6	10.6	16.6	16.6
Prop In Lane	1.00		0.48	1.00		0.36	1.00		1.00	1.00		0.20
Lane Grp Cap(c), veh/h	339	356	341	406	423	417	113	783	703	218	496	501
V/C Ratio(X)	0.30	0.77	0.78	0.44	0.32	0.33	0.79	0.82	0.14	0.92	0.69	0.70
Avail Cap(c_a), veh/h	339	482	462	406	508	501	136	891	750	218	527	533
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.53	0.53	0.53	1.00	1.00	1.00	0.66	0.66	0.66
Uniform Delay (d), s/veh	32.9	35.8	35.9	31.3	29.7	29.8	43.8	35.2	5.0	41.2	30.5	30.5
Incr Delay (d2), s/veh	0.5	5.1	6.0	0.4	0.2	0.2	21.9	5.6	0.1	29.8	2.4	2.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	6.2	6.2	3.4	2.5	2.5	2.7	7.4	0.6	6.3	7.0	7.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.4	41.0	42.0	31.7	30.0	30.1	65.8	40.8	5.1	70.9	32.9	33.0
LnGrp LOS	C	D	D	C	C	C	E	D	A	E	C	C
Approach Vol, veh/h	640				450		828				893	
Approach Delay, s/veh	40.2				30.7		39.4				41.4	
Approach LOS	D				C		D				D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	27.1	24.5	11.4	32.0	23.5	28.1	17.0	26.4				
Change Period (Y+Rc), s	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3				
Max Green Setting (Gmax), s	26.0	7.3	28.4	10.7	27.4	11.7	24.0					
Max Q Clear Time (g_c+I10), s	16.2	6.7	18.6	6.6	8.2	12.6	18.5					
Green Ext Time (p_c), s	0.1	2.2	0.0	2.8	0.1	1.3	0.0	2.1				

Intersection Summary

HCM 6th Ctrl Delay 38.8

HCM 6th LOS D









Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary 15: N Dutton Ave & W College Ave

Lance Drive Residential TIA
Near Term AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	730	110	90	520	280	90	350	100	200	220	60
Future Volume (veh/h)	100	730	110	90	520	280	90	350	100	200	220	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	108	785	107	97	559	236	97	376	85	215	237	41
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	135	863	118	123	676	285	497	473	106	587	652	111
Arrive On Green	0.08	0.28	0.28	0.07	0.28	0.28	0.28	0.17	0.17	0.33	0.22	0.22
Sat Flow, veh/h	1767	3108	424	1767	2413	1016	1767	2850	637	1767	3003	511
Grp Volume(v), veh/h	108	445	447	97	408	387	97	231	230	215	137	141
Grp Sat Flow(s),veh/h/ln	1767	1763	1769	1767	1763	1666	1767	1763	1724	1767	1763	1751
Q Serve(g_s), s	5.7	23.2	23.2	5.1	20.6	20.7	4.0	11.9	12.2	8.8	6.3	6.5
Cycle Q Clear(g_c), s	5.7	23.2	23.2	5.1	20.6	20.7	4.0	11.9	12.2	8.8	6.3	6.5
Prop In Lane	1.00		0.24	1.00		0.61	1.00		0.37	1.00		0.29
Lane Grp Cap(c), veh/h	135	489	491	123	494	467	497	293	286	587	382	380
V/C Ratio(X)	0.80	0.91	0.91	0.79	0.83	0.83	0.20	0.79	0.80	0.37	0.36	0.37
Avail Cap(c_a), veh/h	167	570	572	167	570	538	497	410	401	587	577	573
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.66	0.66	0.66	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.1	33.2	33.2	43.5	32.0	32.1	26.0	38.0	38.1	24.1	31.6	31.7
Incr Delay (d2), s/veh	10.8	11.4	11.4	11.3	7.6	8.2	0.1	4.3	5.3	0.1	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	11.1	11.1	2.6	9.5	9.1	1.6	5.4	5.4	3.5	2.6	2.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.0	44.5	44.5	54.8	39.6	40.3	26.0	42.3	43.4	24.3	31.8	31.9
LnGrp LOS	D	D	D	D	D	D	C	D	D	C	C	C
Approach Vol, veh/h	1000				892				558			
Approach Delay, s/veh	45.5				41.5				39.9			
Approach LOS	D				D				D			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), \$0.5	30.3	29.7	24.5	10.3	30.5	34.6	19.7					
Change Period (Y+Rc), s	3.9	* 3.9	3.0	3.9	3.0	3.9	3.0	3.9				
Max Green Setting (Gmax), s	31.0	* 31	10.4	31.1	9.0	30.7	19.4	22.1				
Max Q Clear Time (g_c+11), s	25.2	6.0	8.5	7.7	22.7	10.8	14.2					
Green Ext Time (p_c), s	0.0	1.2	0.0	0.5	0.0	1.3	0.1	0.7				

Intersection Summary

HCM 6th Ctrl Delay 40.4
HCM 6th LOS D

Notes





User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection

Intersection Delay, s/veh 7.7

Intersection LOS A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	10	0	0	10	50	0	0	0	80	0	0
Future Vol, veh/h	0	10	0	0	10	50	0	0	0	80	0	0
Peak Hour Factor	0.66	0.66	0.92	0.92	0.66	0.66	0.92	0.92	0.92	0.66	0.92	0.66
Heavy Vehicles, %	3	3	2	2	3	3	2	2	2	3	2	3
Mvmt Flow	0	15	0	0	15	76	0	0	0	121	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0























Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.4	7.1	0	8.1
HCM LOS	A	A	-	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	0%	0%	100%
Vol Thru, %	100%	100%	17%	0%
Vol Right, %	0%	0%	83%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	0	10	60	80
LT Vol	0	0	0	80
Through Vol	0	10	10	0
RT Vol	0	0	50	0
Lane Flow Rate	0	15	91	121
Geometry Grp	1	1	1	1
Degree of Util (X)	0	0.018	0.093	0.146
Departure Headway (Hd)	4.212	4.235	3.674	4.334
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	0	833	960	827
Service Time	2.279	2.322	1.754	2.367
HCM Lane V/C Ratio	0	0.018	0.095	0.146
HCM Control Delay	7.3	7.4	7.1	8.1
HCM Lane LOS	N	A	A	A
HCM 95th-tile Q	0	0.1	0.3	0.5

HCM 6th Signalized Intersection Summary







1: Marlow Rd & Marlow Ct/W Steele Ln

Lance Drive Residential TIA
Near Term AM (120 Seconds)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	10	10	220	10	180	10	520	220	140	500	10
Future Volume (veh/h)	10	10	10	220	10	180	10	520	220	140	500	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		1.00	1.00		0.96	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	12	12	2	265	0	119	12	605	163	163	581	12
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	29	29	5	1665	0	911	24	793	1079	194	1125	23
Arrive On Green	0.04	0.04	0.04	0.47	0.00	0.47	0.01	0.22	0.22	0.11	0.32	0.32
Sat Flow, veh/h	822	822	137	3534	0	1565	1767	3526	1505	1767	3532	73
Grp Volume(v), veh/h	26	0	0	265	0	119	12	605	163	163	290	303
Grp Sat Flow(s),veh/h/ln	1781	0	0	1767	0	1565	1767	1763	1505	1767	1763	1842
Q Serve(g_s), s	1.7	0.0	0.0	5.1	0.0	0.0	0.8	19.3	4.4	10.9	16.1	16.1
Cycle Q Clear(g_c), s	1.7	0.0	0.0	5.1	0.0	0.0	0.8	19.3	4.4	10.9	16.1	16.1
Prop In Lane	0.46		0.08	1.00		1.00	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	63	0	0	1665	0	911	24	793	1079	194	562	587
V/C Ratio(X)	0.41	0.00	0.00	0.16	0.00	0.13	0.49	0.76	0.15	0.84	0.52	0.52
Avail Cap(c_a), veh/h	224	0	0	1665	0	911	149	1040	1185	517	883	922
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.59	0.59	0.59	1.00	1.00	1.00
Uniform Delay (d), s/veh	56.6	0.0	0.0	18.1	0.0	11.4	58.8	43.5	6.2	52.3	33.3	33.3
Incr Delay (d2), s/veh	4.2	0.0	0.0	0.2	0.0	0.3	8.9	1.5	0.0	9.2	0.7	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	0.0	2.2	0.0	1.5	0.4	8.5	4.2	5.3	6.9	7.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.8	0.0	0.0	18.3	0.0	11.7	67.7	45.0	6.3	61.5	34.1	34.0
LnGrp LOS	E	A	A	B	A	B	E	D	A	E	C	C
Approach Vol, veh/h		26			384			780			756	
Approach Delay, s/veh		60.8			16.3			37.2			40.0	
Approach LOS		E			B			D			D	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		61.1	6.5	43.1		9.2	18.1	31.6				
Change Period (Y+Rc), s		4.6	4.9	4.9		4.9	4.9	4.6				
Max Green Setting (Gmax), s		15.4	10.1	60.1		15.1	35.1	35.4				
Max Q Clear Time (g_c+I1), s		7.1	2.8	18.1		3.7	12.9	21.3				
Green Ext Time (p_c), s		0.9	0.0	3.8		0.0	0.4	3.9				
Intersection Summary												
HCM 6th Ctrl Delay				34.5								
HCM 6th LOS				C								
Notes												
User approved pedestrian interval to be less than phase max green.												
User approved volume balancing among the lanes for turning movement.												






















HCM 6th TWSC
2: Iroquois St/Apple Valley Ln & W Steele Ln

Lance Drive Residential TIA
Near Term AM (120 Seconds)

Intersection												
Int Delay, s/veh	5.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	30	370	50	20	310	20	50	10	30	20	10	40
Future Vol, veh/h	30	370	50	20	310	20	50	10	30	20	10	40
Conflicting Peds, #/hr	12	0	24	24	0	12	4	0	4	4	0	4
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	60	-	-	80	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	36	446	60	24	373	24	60	12	36	24	12	48
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	409	0	0	530	0	0	1039	1029	504	1021	1047	401
Stage 1	-	-	-	-	-	-	572	572	-	445	445	-
Stage 2	-	-	-	-	-	-	467	457	-	576	602	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1144	-	-	1032	-	-	208	233	566	214	227	647
Stage 1	-	-	-	-	-	-	503	503	-	590	573	-
Stage 2	-	-	-	-	-	-	574	566	-	501	487	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1131	-	-	1008	-	-	171	213	551	181	207	637
Mov Cap-2 Maneuver	-	-	-	-	-	-	171	213	-	181	207	-
Stage 1	-	-	-	-	-	-	476	476	-	565	553	-
Stage 2	-	-	-	-	-	-	505	546	-	440	461	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.6			0.5			34.1			20.5		
HCM LOS							D			C		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	229	1131	-	-	1008	-	-	316				
HCM Lane V/C Ratio	0.474	0.032	-	-	0.024	-	-	0.267				
HCM Control Delay (s)	34.1	8.3	-	-	8.7	-	-	20.5				
HCM Lane LOS	D	A	-	-	A	-	-	C				
HCM 95th %tile Q(veh)	2.3	0.1	-	-	0.1	-	-	1.1				

HCM 6th Signalized Intersection Summary 3: Range Ave & W Steele Ln

Lance Drive Residential TIA
Near Term AM (120 Seconds)











												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	420	60	50	280	40	40	170	30	30	150	30
Future Volume (veh/h)	40	420	60	50	280	40	40	170	30	30	150	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.95	1.00		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	45	477	66	57	318	43	45	193	20	34	170	12
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	764	1206	167	618	1208	163	58	386	39	50	410	29
Arrive On Green	0.76	0.76	0.76	0.76	0.76	0.76	0.03	0.12	0.12	0.03	0.12	0.12
Sat Flow, veh/h	1011	1594	221	856	1597	216	1767	3211	328	1767	3328	232
Grp Volume(v), veh/h	45	0	543	57	0	361	45	105	108	34	89	93
Grp Sat Flow(s),veh/h/ln	1011	0	1815	856	0	1812	1767	1763	1776	1767	1763	1797
Q Serve(g_s), s	1.7	0.0	12.5	3.0	0.0	7.3	3.0	6.7	6.9	2.3	5.6	5.7
Cycle Q Clear(g_c), s	9.0	0.0	12.5	15.4	0.0	7.3	3.0	6.7	6.9	2.3	5.6	5.7
Prop In Lane	1.00		0.12	1.00		0.12	1.00		0.18	1.00		0.13
Lane Grp Cap(c), veh/h	764	0	1373	618	0	1371	58	212	213	50	217	222
V/C Ratio(X)	0.06	0.00	0.40	0.09	0.00	0.26	0.78	0.49	0.51	0.68	0.41	0.42
Avail Cap(c_a), veh/h	764	0	1373	618	0	1371	162	413	416	147	398	406
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.83	0.83	0.83	1.00	1.00	1.00
Uniform Delay (d), s/veh	5.8	0.0	5.1	7.8	0.0	4.4	57.6	49.4	49.5	57.8	48.6	48.6
Incr Delay (d2), s/veh	0.1	0.0	0.9	0.3	0.0	0.5	6.9	0.6	0.6	5.9	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	4.2	0.6	0.0	2.4	1.4	2.9	3.0	1.1	2.5	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	5.9	0.0	5.9	8.0	0.0	4.9	64.5	49.9	50.0	63.7	49.0	49.1
LnGrp LOS	A	A	A	A	A	A	E	D	D	E	D	D
Approach Vol, veh/h	588					418		258		216		
Approach Delay, s/veh	5.9					5.3		52.5		51.4		
Approach LOS	A					A		D		D		
Timer - Assigned Phs	2		3		4		6		7		8	
Phs Duration (G+Y+Rc), s	94.4		6.9		18.7		94.4		7.3		18.3	
Change Period (Y+Rc), s	3.6		3.0		3.9		3.6		3.9		* 3.9	
Max Green Setting (Gmax), s	71.4		11.0		27.1		71.4		10.0		* 28	
Max Q Clear Time (g_c+I1), s	14.5		5.0		7.7		17.4		4.3		8.9	
Green Ext Time (p_c), s	1.2		0.0		0.3		0.9		0.0		0.3	
Intersection Summary												
HCM 6th Ctrl Delay	20.5											
HCM 6th LOS	C											
Notes												

HCM 6th Signalized Intersection Summary

4: Marlow Rd & Guerneville Rd

Lance Drive Residential TIA
Near Term AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	120	440	150	150	280	100	130	480	170	110	500	90
Future Volume (veh/h)	120	440	150	150	280	100	130	480	170	110	500	90
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No				No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	130	478	97	163	304	83	141	522	62	120	543	85
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	157	622	425	192	546	147	169	653	456	227	663	103
Arrive On Green	0.09	0.18	0.18	0.11	0.20	0.20	0.10	0.19	0.19	0.04	0.07	0.07
Sat Flow, veh/h	1767	3526	1556	1767	2742	736	1767	3526	1539	1767	3046	475
Grp Volume(v), veh/h	130	478	97	163	193	194	141	522	62	120	313	315
Grp Sat Flow(s),veh/h/ln	1767	1763	1556	1767	1763	1715	1767	1763	1539	1767	1763	1758
Q Serve(g_s), s	8.7	15.5	2.1	10.9	11.8	12.2	9.4	17.0	0.0	8.0	21.0	21.2
Cycle Q Clear(g_c), s	8.7	15.5	2.1	10.9	11.8	12.2	9.4	17.0	0.0	8.0	21.0	21.2
Prop In Lane	1.00		1.00	1.00		0.43	1.00		1.00	1.00		0.27
Lane Grp Cap(c), veh/h	157	622	425	192	351	342	169	653	456	227	384	383
V/C Ratio(X)	0.83	0.77	0.23	0.85	0.55	0.57	0.83	0.80	0.14	0.53	0.82	0.82
Avail Cap(c_a), veh/h	246	861	531	290	474	462	275	961	590	246	451	450
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	0.99	0.99	0.99	0.59	0.59	0.59	0.91	0.91	0.91
Uniform Delay (d), s/veh	53.8	47.1	5.9	52.5	43.2	43.4	53.3	46.7	31.1	53.9	53.3	53.4
Incr Delay (d2), s/veh	12.3	2.8	0.3	13.7	6.0	6.6	6.8	1.8	0.1	1.7	8.9	9.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.3	6.9	1.6	5.5	5.7	5.7	4.4	7.5	1.3	3.8	10.9	11.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	66.0	49.9	6.2	66.2	49.3	50.0	60.1	48.5	31.2	55.7	62.2	62.7
LnGrp LOS	E	D	A	E	D	D	E	D	C	E	E	E
Approach Vol, veh/h	705		550				725			748		
Approach Delay, s/veh	46.9		54.5				49.3			61.4		
Approach LOS	D		D				D			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.7	26.9	16.8	31.4	16.0	29.6	20.7	27.5				
Change Period (Y+Rc), s	5.7	* 5.7	5.3	5.3	5.3	5.7	5.3	5.3				
Max Green Setting (Gmax), s	29.3	* 29	18.7	30.7	16.7	32.3	16.7	32.7				
Max Q Clear Time (g_c+I12, s)	17.5	17.5	11.4	23.2	10.7	14.2	10.0	19.0				
Green Ext Time (p_c), s	0.2	2.6	0.2	2.2	0.1	2.0	0.1	2.9				

Intersection Summary

HCM 6th Ctrl Delay 53.0

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary 5: Ridley Ave & Guerneville Rd

Lance Drive Residential TIA
Near Term AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	700	30	60	440	20	40	10	60	40	10	30
Future Volume (veh/h)	30	700	30	60	440	20	40	10	60	40	10	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	0.98		0.96	0.98		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	34	787	33	67	494	21	45	11	19	45	11	9
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	707	2915	122	590	2917	124	127	34	38	146	35	21
Arrive On Green	0.85	0.85	0.85	0.28	0.28	0.28	0.10	0.10	0.10	0.10	0.10	0.10
Sat Flow, veh/h	877	3444	144	661	3445	146	820	352	397	994	363	218
Grp Volume(v), veh/h	34	403	417	67	252	263	75	0	0	65	0	0
Grp Sat Flow(s),veh/h/ln	877	1763	1825	661	1763	1829	1569	0	0	1575	0	0
Q Serve(g_s), s	1.3	5.5	5.5	9.3	13.0	13.0	0.8	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	14.3	5.5	5.5	14.7	13.0	13.0	4.9	0.0	0.0	4.2	0.0	0.0
Prop In Lane	1.00		0.08	1.00		0.08	0.60		0.25	0.69		0.14
Lane Grp Cap(c), veh/h	707	1492	1545	590	1492	1548	198	0	0	202	0	0
V/C Ratio(X)	0.05	0.27	0.27	0.11	0.17	0.17	0.38	0.00	0.00	0.32	0.00	0.00
Avail Cap(c_a), veh/h	707	1492	1545	590	1492	1548	531	0	0	531	0	0
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.93	0.93	0.93	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	4.3	1.8	1.8	14.0	11.3	11.3	51.2	0.0	0.0	50.9	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.4	0.4	0.0	0.0	0.0	0.4	0.0	0.0	0.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	1.1	1.1	1.6	6.1	6.4	2.2	0.0	0.0	1.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	4.4	2.2	2.2	14.0	11.3	11.4	51.7	0.0	0.0	51.3	0.0	0.0
LnGrp LOS	A	A	A	B	B	B	D	A	A	D	A	A
Approach Vol, veh/h	854			582			75			65		
Approach Delay, s/veh	2.3			11.7			51.7			51.3		
Approach LOS	A			B			D			D		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	105.5			14.5			105.5			14.5		
Change Period (Y+Rc), s	3.9			3.0			3.9			3.0		
Max Green Setting (Gmax), s	74.1			39.0			74.1			39.0		
Max Q Clear Time (g_c+I1), s	16.3			6.2			16.7			6.9		
Green Ext Time (p_c), s	1.6			0.2			1.2			0.2		

Intersection Summary

HCM 6th Ctrl Delay	10.1
HCM 6th LOS	B

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

6: Lance Dr & Guerneville Rd

Lance Drive Residential TIA
Near Term AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	750	30	30	440	50	20	50	70	60	80	60
Future Volume (veh/h)	30	750	30	30	440	50	20	50	70	60	80	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.99	0.99		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	36	893	35	36	524	40	24	60	47	71	95	56
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	62	965	38	72	1006	438	66	146	99	112	126	67
Arrive On Green	0.01	0.09	0.09	0.08	0.57	0.57	0.17	0.17	0.17	0.17	0.17	0.17
Sat Flow, veh/h	1767	3455	135	1767	3526	1536	183	874	591	437	754	402
Grp Volume(v), veh/h	36	456	472	36	524	40	131	0	0	222	0	0
Grp Sat Flow(s), veh/h/ln	1767	1763	1827	1767	1763	1536	1648	0	0	1593	0	0
Q Serve(g_s), s	2.4	30.8	30.8	2.3	10.9	1.4	0.0	0.0	0.0	7.8	0.0	0.0
Cycle Q Clear(g_c), s	2.4	30.8	30.8	2.3	10.9	1.4	8.2	0.0	0.0	16.1	0.0	0.0
Prop In Lane	1.00		0.07	1.00		1.00	0.18		0.36	0.32		0.25
Lane Grp Cap(c), veh/h	62	493	511	72	1006	438	310	0	0	305	0	0
V/C Ratio(X)	0.58	0.92	0.92	0.50	0.52	0.09	0.42	0.00	0.00	0.73	0.00	0.00
Avail Cap(c_a), veh/h	143	804	833	158	1636	713	568	0	0	556	0	0
HCM Platoon Ratio	0.33	0.33	0.33	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.98	0.98	0.98	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	58.4	53.2	53.2	53.9	20.8	18.7	45.1	0.0	0.0	48.2	0.0	0.0
Incr Delay (d2), s/veh	3.2	7.5	7.3	1.9	1.9	0.4	0.3	0.0	0.0	1.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	15.5	16.1	1.0	3.8	0.5	3.6	0.0	0.0	6.6	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.6	60.7	60.5	55.9	22.6	19.1	45.4	0.0	0.0	49.4	0.0	0.0
LnGrp LOS	E	E	E	E	C	B	D	A	A	D	A	A
Approach Vol, veh/h	964			600			131			222		
Approach Delay, s/veh	60.6			24.4			45.4			49.4		
Approach LOS	E			C			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	38.8			24.6	9.5	39.5		24.6				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		4.6				
Max Green Setting (Gmax), s	54.7			39.4	9.7	55.7		39.4				
Max Q Clear Time (g_c+14.3), s	32.8			18.1	4.4	12.9		10.2				
Green Ext Time (p_c), s	0.0	0.8		0.3	0.0	0.6		0.2				

Intersection Summary

HCM 6th Ctrl Delay 47.0

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

7: N Dutton Ave/Westberry Dr & Guerneville Rd

Lance Drive Residential TIA
Near Term AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	850	110	250	460	10	90	10	380	20	10	10
Future Volume (veh/h)	10	850	110	250	460	10	90	10	380	20	10	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	12	1024	127	301	554	11	117	0	147	24	12	1
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	29	1074	133	1353	2541	50	174	0	698	51	26	2
Arrive On Green	0.02	0.34	0.34	0.79	1.00	1.00	0.05	0.00	0.05	0.04	0.04	0.04
Sat Flow, veh/h	1767	3149	390	3428	3533	70	3534	0	1563	1159	580	48
Grp Volume(v), veh/h	12	573	578	301	276	289	117	0	147	37	0	0
Grp Sat Flow(s), veh/h/ln	1767	1763	1777	1714	1763	1841	1767	0	1563	1787	0	0
Q Serve(g_s), s	0.8	38.1	38.2	2.7	0.0	0.0	3.9	0.0	0.0	2.4	0.0	0.0
Cycle Q Clear(g_c), s	0.8	38.1	38.2	2.7	0.0	0.0	3.9	0.0	0.0	2.4	0.0	0.0
Prop In Lane	1.00		0.22	1.00		0.04	1.00		1.00	0.65		0.03
Lane Grp Cap(c), veh/h	29	601	606	1353	1268	1324	174	0	698	79	0	0
V/C Ratio(X)	0.41	0.95	0.95	0.22	0.22	0.22	0.67	0.00	0.21	0.47	0.00	0.00
Avail Cap(c_a), veh/h	90	667	672	1353	1268	1324	265	0	738	378	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.93	0.93	0.93	0.94	0.94	0.94	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	58.4	38.6	38.6	7.9	0.0	0.0	56.1	0.0	20.5	56.0	0.0	0.0
Incr Delay (d2), s/veh	3.2	25.6	25.7	0.0	0.4	0.4	1.7	0.0	0.1	1.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	20.1	20.3	0.9	0.1	0.1	1.8	0.0	2.5	1.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.6	64.2	64.3	8.0	0.4	0.4	57.7	0.0	20.5	57.6	0.0	0.0
LnGrp LOS	E	E	E	A	A	A	E	A	C	E	A	A
Approach Vol, veh/h	1163			866			264			37		
Approach Delay, s/veh	64.2			3.0			37.0			57.6		
Approach LOS	E			A			D			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	52.7	46.2		9.9	7.3	91.6		11.2				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		5.3				
Max Green Setting (Gmax), s	45.4	45.4		25.4	6.1	59.0		9.0				
Max Q Clear Time (g_c+14), s	40.2	40.2		4.4	2.8	2.0		5.9				
Green Ext Time (p_c), s	0.0	0.8		0.0	0.0	0.4		0.0				

Intersection Summary

HCM 6th Ctrl Delay 38.3

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

8: Herbert St/Coffey Ln & Guerneville Rd

Lance Drive Residential TIA
Near Term AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	140	1080	30	20	530	40	20	20	20	80	10	160
Future Volume (veh/h)	140	1080	30	20	530	40	20	20	20	80	10	160
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		0.96	1.00		0.94	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	163	1256	34	23	616	44	23	23	6	93	12	39
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	186	1273	34	556	1904	136	49	49	13	145	19	305
Arrive On Green	0.21	0.73	0.73	0.63	1.00	1.00	0.06	0.06	0.06	0.09	0.09	0.09
Sat Flow, veh/h	1767	3501	95	1767	3325	237	780	780	204	1574	203	1510
Grp Volume(v), veh/h	163	632	658	23	326	334	52	0	0	105	0	39
Grp Sat Flow(s), veh/h/ln	1767	1763	1833	1767	1763	1800	1764	0	0	1777	0	1510
Q Serve(g_s), s	10.7	41.4	41.6	0.6	0.0	0.0	3.4	0.0	0.0	6.8	0.0	2.6
Cycle Q Clear(g_c), s	10.7	41.4	41.6	0.6	0.0	0.0	3.4	0.0	0.0	6.8	0.0	2.6
Prop In Lane	1.00		0.05	1.00		0.13	0.44		0.12	0.89		1.00
Lane Grp Cap(c), veh/h	186	641	667	556	1009	1031	110	0	0	163	0	305
V/C Ratio(X)	0.87	0.99	0.99	0.04	0.32	0.32	0.47	0.00	0.00	0.64	0.00	0.13
Avail Cap(c_a), veh/h	225	642	667	556	1009	1031	367	0	0	386	0	494
HCM Platoon Ratio	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.74	0.74	0.74	0.94	0.94	0.94	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	46.6	16.0	16.1	15.4	0.0	0.0	54.3	0.0	0.0	52.6	0.0	39.7
Incr Delay (d2), s/veh	18.4	27.3	27.0	0.0	0.8	0.8	1.2	0.0	0.0	1.6	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.1	10.6	10.9	0.2	0.2	0.2	1.6	0.0	0.0	3.1	0.0	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	64.9	43.3	43.1	15.4	0.8	0.8	55.5	0.0	0.0	54.2	0.0	39.7
LnGrp LOS	E	D	D	B	A	A	E	A	A	D	A	D
Approach Vol, veh/h	1453			683			52			144		
Approach Delay, s/veh	45.6			1.3			55.5			50.3		
Approach LOS	D			A			E			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	43.0	49.0		15.9	18.0	74.0		12.1				
Change Period (Y+Rc), s	5.3	5.3		4.9	5.3	5.3		4.6				
Max Green Setting (Gmax), s	43.7			26.1	15.3	33.5		25.0				
Max Q Clear Time (g_c+1/2C), s	43.6			8.8	12.7	2.0		5.4				
Green Ext Time (p_c), s	0.0	0.0		0.1	0.0	0.5		0.0				
Intersection Summary												
HCM 6th Ctrl Delay	33.2											
HCM 6th LOS	C											

HCM 6th Signalized Intersection Summary

9: Range Ave & Guerneville Rd

Lance Drive Residential TIA
Near Term AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	150	710	150	70	410	10	130	90	80	40	100	110
Future Volume (veh/h)	150	710	150	70	410	10	130	90	80	40	100	110
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.96	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No		No				No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	160	755	0	74	436	0	81	176	8	43	106	8
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	219	809		94	559		130	259	12	103	192	14
Arrive On Green	0.25	0.46	0.00	0.05	0.16	0.00	0.07	0.07	0.07	0.02	0.02	0.02
Sat Flow, veh/h	1767	3618	0	1767	3618	0	1767	3515	159	1767	3312	247
Grp Volume(v), veh/h	160	755	0	74	436	0	81	92	92	43	56	58
Grp Sat Flow(s), veh/h/ln	1767	1763	0	1767	1763	0	1767	1856	1819	1767	1763	1796
Q Serve(g_s), s	10.0	24.3	0.0	5.0	14.2	0.0	5.3	5.8	5.9	2.9	3.8	3.9
Cycle Q Clear(g_c), s	10.0	24.3	0.0	5.0	14.2	0.0	5.3	5.8	5.9	2.9	3.8	3.9
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.09	1.00		0.14
Lane Grp Cap(c), veh/h	219	809		94	559		130	137	134	103	102	104
V/C Ratio(X)	0.73	0.93		0.79	0.78		0.62	0.68	0.68	0.42	0.55	0.56
Avail Cap(c_a), veh/h	437	1548		246	1166		227	238	233	216	216	220
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	0.80	0.80	0.00	0.98	0.98	0.00	1.00	1.00	1.00	0.82	0.82	0.82
Uniform Delay (d), s/veh	43.3	31.6	0.0	56.1	48.5	0.0	54.0	54.2	54.2	56.9	57.3	57.3
Incr Delay (d2), s/veh	1.4	1.9	0.0	5.3	10.1	0.0	1.8	2.2	2.3	0.8	1.4	1.4
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	7.7	0.0	2.3	7.0	0.0	2.4	2.8	2.8	1.3	1.7	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.7	33.4	0.0	61.4	58.6	0.0	55.8	56.3	56.5	57.7	58.7	58.8
LnGrp LOS	D	C		E	E		E	E	E	E	E	E
Approach Vol, veh/h	915		A	510		A	265		157			
Approach Delay, s/veh	35.4			59.0			56.2		58.4			
Approach LOS	D			E			E		E			
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	1.7	32.8		12.3	20.2	24.3		13.4				
Change Period (Y+Rc), s	5.3	5.3		5.3	5.3	5.3		4.6				
Max Green Setting (Gmax), s	6.3	52.7		14.7	29.7	39.7		15.4				
Max Q Clear Time (g_c+11), s	26.3			5.9	12.0	16.2		7.9				
Green Ext Time (p_c), s	0.0	0.9		0.0	0.0	0.5		0.1				

Intersection Summary

HCM 6th Ctrl Delay 46.9

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

10: Guerneville Rd & Steele Wy

Lance Drive Residential TIA
Near Term AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	760	50	60	450	10	30	10	60	390	20	10
Future Volume (veh/h)	30	760	50	60	450	10	30	10	60	390	20	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	34	864	37	68	511	10	22	27	6	459	0	5
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	833	2040	995	200	586	11	97	102	177	520	0	972
Arrive On Green	0.47	0.58	0.58	0.06	0.17	0.17	0.05	0.05	0.05	0.15	0.00	0.15
Sat Flow, veh/h	1767	3526	1571	3428	3534	69	1767	1856	1556	3534	0	1566
Grp Volume(v), veh/h	34	864	37	68	255	266	22	27	6	459	0	5
Grp Sat Flow(s), veh/h/ln	1767	1763	1571	1714	1763	1841	1767	1856	1556	1767	0	1566
Q Serve(g_s), s	1.2	16.4	1.1	2.3	16.9	16.9	1.4	1.7	0.4	15.3	0.0	0.0
Cycle Q Clear(g_c), s	1.2	16.4	1.1	2.3	16.9	16.9	1.4	1.7	0.4	15.3	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.04	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	833	2040	995	200	292	305	97	102	177	520	0	972
V/C Ratio(X)	0.04	0.42	0.04	0.34	0.87	0.87	0.23	0.27	0.03	0.88	0.00	0.01
Avail Cap(c_a), veh/h	833	2040	995	203	580	606	398	417	442	798	0	1095
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.91	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.1	14.1	8.2	54.3	48.8	48.8	54.3	54.4	47.4	50.1	0.0	8.8
Incr Delay (d2), s/veh	0.0	0.6	0.1	0.4	3.2	3.1	0.4	0.5	0.0	5.1	0.0	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	6.4	0.4	1.0	7.6	8.0	0.6	0.8	0.2	7.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.1	14.7	8.3	54.7	52.0	51.9	54.7	54.9	47.4	55.3	0.0	8.8
LnGrp LOS	B	B	A	D	D	D	D	D	D	E	A	A
Approach Vol, veh/h	935			589			55			464		
Approach Delay, s/veh	14.5			52.3			54.0			54.8		
Approach LOS	B			D			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	1.9	74.3		22.6	61.5	24.8		11.2				
Change Period (Y+Rc), s	4.9	4.9		4.9	4.9	4.9		4.6				
Max Green Setting (Gmax), s	39.5			27.1	7.1	39.5		27.0				
Max Q Clear Time (g_c+14.3), s	18.4			17.3	3.2	18.9		3.7				
Green Ext Time (p_c), s	0.0	1.2		0.1	0.0	0.4		0.0				

Intersection Summary

HCM 6th Ctrl Delay 35.6

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

11: Cleveland Ave & Guerneville Rd

Lance Drive Residential TIA
Near Term AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰ ↱	↑ ↑		↰ ↱	↑ ↑	↱	↰	↑ ↑		↰ ↱	↰ ↱	
Traffic Volume (veh/h)	60	1150	40	180	820	190	30	90	150	230	70	40
Future Volume (veh/h)	60	1150	40	180	820	190	30	90	150	230	70	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	66	1264	41	198	901	109	33	99	58	253	77	28
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	244	1374	45	252	970	423	689	854	464	355	130	47
Arrive On Green	0.07	0.27	0.27	0.07	0.28	0.28	0.39	0.39	0.39	0.10	0.10	0.10
Sat Flow, veh/h	3428	5036	163	3428	3526	1536	1767	2190	1190	3534	1291	470
Grp Volume(v), veh/h	66	848	457	198	901	109	33	78	79	253	0	105
Grp Sat Flow(s), veh/h/ln	1714	1689	1822	1714	1763	1536	1767	1763	1617	1767	0	1761
Q Serve(g_s), s	2.2	29.2	29.2	6.8	29.9	6.6	1.4	3.4	3.8	8.3	0.0	6.8
Cycle Q Clear(g_c), s	2.2	29.2	29.2	6.8	29.9	6.6	1.4	3.4	3.8	8.3	0.0	6.8
Prop In Lane	1.00		0.09	1.00		1.00	1.00		0.74	1.00		0.27
Lane Grp Cap(c), veh/h	244	921	497	252	970	423	689	687	631	355	0	177
V/C Ratio(X)	0.27	0.92	0.92	0.79	0.93	0.26	0.05	0.11	0.13	0.71	0.00	0.59
Avail Cap(c_a), veh/h	244	1185	639	374	1413	616	689	687	631	857	0	427
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.75	0.75	0.75	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	52.8	42.4	42.4	54.7	42.3	33.9	22.8	23.4	23.5	52.3	0.0	51.6
Incr Delay (d2), s/veh	0.2	8.6	14.2	2.6	5.2	0.1	0.1	0.3	0.4	1.0	0.0	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	13.1	14.9	3.0	13.4	2.5	0.6	1.5	1.5	3.7	0.0	3.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	53.0	51.0	56.6	57.2	47.5	34.0	22.9	23.7	23.9	53.3	0.0	52.8
LnGrp LOS	D	D	E	E	D	C	C	C	C	D	A	D
Approach Vol, veh/h	1371			1208			190			358		
Approach Delay, s/veh	52.9			47.9			23.6			53.2		
Approach LOS	D			D			C			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	37.6			51.7	13.4	37.9		16.9				
Change Period (Y+Rc), s	4.9	4.9		4.9	4.9	4.9		4.9				
Max Green Setting (Gmax), s	42.1			16.1	7.1	48.1		29.1				
Max Q Clear Time (g_c+10), s	31.2			5.8	4.2	31.9		10.3				
Green Ext Time (p_c), s	0.0	1.5		0.1	0.0	1.2		0.1				

Intersection Summary

HCM 6th Ctrl Delay 49.2

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 12: US 101 SB Ramps & Guerneville Rd

Lance Drive Residential TIA
Near Term AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑					↑	↑	↑
Traffic Volume (veh/h)	0	1020	500	260	900	0	0	0	0	350	10	280
Future Volume (veh/h)	0	1020	500	260	900	0	0	0	0	350	10	280
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1856	1856	1856	1856	0				1856	1856	1856
Adj Flow Rate, veh/h	0	1146	152	292	1011	0				401	0	258
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89				0.89	0.89	0.89
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	1266	386	345	1380	0				1871	0	833
Arrive On Green	0.00	0.25	0.25	0.10	0.39	0.00				0.53	0.00	0.53
Sat Flow, veh/h	0	5233	1543	3428	3618	0				3534	0	1572
Grp Volume(v), veh/h	0	1146	152	292	1011	0				401	0	258
Grp Sat Flow(s),veh/h/ln	0	1689	1543	1714	1763	0				1767	0	1572
Q Serve(g_s), s	0.0	26.3	9.8	10.0	29.4	0.0				7.2	0.0	11.1
Cycle Q Clear(g_c), s	0.0	26.3	9.8	10.0	29.4	0.0				7.2	0.0	11.1
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1266	386	345	1380	0				1871	0	833
V/C Ratio(X)	0.00	0.91	0.39	0.85	0.73	0.00				0.21	0.00	0.31
Avail Cap(c_a), veh/h	0	2030	619	546	2118	0				1871	0	833
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.36	0.36	0.83	0.83	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	43.6	37.4	53.0	31.2	0.0				15.0	0.0	15.9
Incr Delay (d2), s/veh	0.0	1.0	0.1	3.3	0.2	0.0				0.3	0.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	10.9	3.7	4.4	12.2	0.0				2.8	0.0	4.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	44.6	37.5	56.3	31.4	0.0				15.2	0.0	16.9
LnGrp LOS	A	D	D	E	C	A				B	A	B
Approach Vol, veh/h		1298			1303						659	
Approach Delay, s/veh		43.8			37.0						15.9	
Approach LOS		D			D						B	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	7.0	34.9		68.1		51.9						
Change Period (Y+Rc), s	4.9	4.9		4.6		4.9						
Max Green Setting (Gmax), s	48.1			38.4		72.1						
Max Q Clear Time (g_c+I12, s)	28.3			13.1		31.4						
Green Ext Time (p_c), s	0.0	1.7		0.1		1.4						

Intersection Summary

HCM 6th Ctrl Delay 35.4
HCM 6th LOS D

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 13: US 101 NB Ramps & Guerneville Rd/Steele Ln

Lance Drive Residential TIA
Near Term AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↑↑			↑↑↑		↰	↰↱	↰			
Traffic Volume (veh/h)	380	990	0	0	800	210	360	10	420	0	0	0
Future Volume (veh/h)	380	990	0	0	800	210	360	10	420	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1856	1856	0	0	1856	1856	1856	1856	1856			
Adj Flow Rate, veh/h	427	1112	0	0	899	207	515	0	231			
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89			
Percent Heavy Veh, %	3	3	0	0	3	3	3	3	3			
Cap, veh/h	1631	2676	0	0	994	228	572	0	254			
Arrive On Green	0.95	1.00	0.00	0.00	0.24	0.24	0.16	0.00	0.16			
Sat Flow, veh/h	3428	3618	0	0	4263	938	3534	0	1572			
Grp Volume(v), veh/h	427	1112	0	0	740	366	515	0	231			
Grp Sat Flow(s),veh/h/ln	1714	1763	0	0	1689	1658	1767	0	1572			
Q Serve(g_s), s	1.0	0.0	0.0	0.0	25.5	25.7	17.2	0.0	17.3			
Cycle Q Clear(g_c), s	1.0	0.0	0.0	0.0	25.5	25.7	17.2	0.0	17.3			
Prop In Lane	1.00		0.00	0.00		0.57	1.00		1.00			
Lane Grp Cap(c), veh/h	1631	2676	0	0	819	402	572	0	254			
V/C Ratio(X)	0.26	0.42	0.00	0.00	0.90	0.91	0.90	0.00	0.91			
Avail Cap(c_a), veh/h	1631	2676	0	0	1185	582	1160	0	516			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.57	0.57	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	1.6	0.0	0.0	0.0	44.1	44.2	49.4	0.0	49.4			
Incr Delay (d2), s/veh	0.0	0.3	0.0	0.0	5.7	11.2	2.2	0.0	5.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.3	0.1	0.0	0.0	11.1	11.6	7.5	0.0	7.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	1.6	0.3	0.0	0.0	49.7	55.3	51.5	0.0	54.4			
LnGrp LOS	A	A	A	A	D	E	D	A	D			
Approach Vol, veh/h	1539				1106				746			
Approach Delay, s/veh	0.6				51.6				52.4			
Approach LOS	A				D				D			
Timer - Assigned Phs	2				5		6		8			
Phs Duration (G+Y+Rc), s	96.0				62.0		34.0		24.0			
Change Period (Y+Rc), s	4.9				4.9		4.9		4.6			
Max Green Setting (Gmax), s	71.1				24.1		42.1		39.4			
Max Q Clear Time (g_c+I1), s	2.0				3.0		27.7		19.3			
Green Ext Time (p_c), s	1.6				0.1		1.4		0.1			

Intersection Summary

HCM 6th Ctrl Delay	28.7
HCM 6th LOS	C

Notes










User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

14: Stony Point Rd/Marlow Rd & W College Ave

Lance Drive Residential TIA
Near Term AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	370	150	160	200	130	80	580	160	180	560	70
Future Volume (veh/h)	90	370	150	160	200	130	80	580	160	180	560	70
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	100	411	129	178	222	50	89	644	95	200	622	71
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	455	491	152	519	639	141	112	753	790	229	890	101
Arrive On Green	0.26	0.19	0.19	0.29	0.22	0.22	0.06	0.21	0.21	0.13	0.28	0.28
Sat Flow, veh/h	1767	2635	817	1767	2868	633	1767	3526	1537	1767	3182	362
Grp Volume(v), veh/h	100	273	267	178	135	137	89	644	95	200	344	349
Grp Sat Flow(s),veh/h/ln	1767	1763	1689	1767	1763	1738	1767	1763	1537	1767	1763	1781
Q Serve(g_s), s	5.3	17.9	18.3	9.5	7.7	8.0	6.0	21.1	1.8	13.3	21.0	21.0
Cycle Q Clear(g_c), s	5.3	17.9	18.3	9.5	7.7	8.0	6.0	21.1	1.8	13.3	21.0	21.0
Prop In Lane	1.00		0.48	1.00		0.36	1.00		1.00	1.00		0.20
Lane Grp Cap(c), veh/h	455	329	315	519	393	387	112	753	790	229	493	498
V/C Ratio(X)	0.22	0.83	0.85	0.34	0.34	0.35	0.79	0.86	0.12	0.87	0.70	0.70
Avail Cap(c_a), veh/h	455	383	367	519	504	497	180	887	849	314	577	583
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.54	0.54	0.54	1.00	1.00	1.00	0.66	0.66	0.66
Uniform Delay (d), s/veh	35.1	47.0	47.2	33.3	39.2	39.4	55.4	45.4	5.3	51.2	38.7	38.7
Incr Delay (d2), s/veh	0.2	12.7	14.8	0.2	0.3	0.3	11.9	7.3	0.1	12.5	2.0	2.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	8.9	8.8	4.0	3.3	3.4	3.0	9.8	0.7	6.6	9.1	9.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.3	59.8	62.0	33.5	39.5	39.7	67.3	52.7	5.4	63.8	40.7	40.7
LnGrp LOS	D	E	E	C	D	D	E	D	A	E	D	D
Approach Vol, veh/h	640				450		828				893	
Approach Delay, s/veh	56.9				37.2		48.8				45.9	
Approach LOS	E				D		D				D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	40.5	27.7	12.9	38.9	36.2	32.0	20.9	30.9				
Change Period (Y+Rc), s	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3				
Max Green Setting (Gmax), s	41.8	26.1	12.2	39.3	13.0	34.3	21.3	30.2				
Max Q Clear Time (g_c+I1), s	41.5	20.3	8.0	23.0	7.3	10.0	15.3	23.1				
Green Ext Time (p_c), s	0.3	1.5	0.1	3.7	0.1	1.4	0.3	2.5				

Intersection Summary

HCM 6th Ctrl Delay 47.9

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary 15: N Dutton Ave & W College Ave

Lance Drive Residential TIA
Near Term AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	730	110	90	520	280	90	350	100	200	220	60
Future Volume (veh/h)	100	730	110	90	520	280	90	350	100	200	220	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	108	785	107	97	559	236	97	376	85	215	237	41
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	132	854	116	120	665	280	583	448	100	667	615	105
Arrive On Green	0.07	0.27	0.27	0.07	0.28	0.28	0.33	0.16	0.16	0.38	0.20	0.20
Sat Flow, veh/h	1767	3108	424	1767	2413	1016	1767	2850	636	1767	3003	511
Grp Volume(v), veh/h	108	445	447	97	408	387	97	231	230	215	137	141
Grp Sat Flow(s),veh/h/ln	1767	1763	1769	1767	1763	1666	1767	1763	1724	1767	1763	1751
Q Serve(g_s), s	7.2	29.4	29.4	6.5	26.2	26.3	4.7	15.2	15.6	10.3	8.1	8.3
Cycle Q Clear(g_c), s	7.2	29.4	29.4	6.5	26.2	26.3	4.7	15.2	15.6	10.3	8.1	8.3
Prop In Lane	1.00		0.24	1.00		0.61	1.00		0.37	1.00		0.29
Lane Grp Cap(c), veh/h	132	484	486	120	486	459	583	277	271	667	361	359
V/C Ratio(X)	0.82	0.92	0.92	0.81	0.84	0.84	0.17	0.83	0.85	0.32	0.38	0.39
Avail Cap(c_a), veh/h	177	604	606	177	604	571	583	383	375	667	574	571
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.64	0.64	0.64	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.7	42.2	42.2	55.1	41.0	41.0	28.5	49.0	49.2	26.5	41.1	41.2
Incr Delay (d2), s/veh	9.8	10.7	10.7	9.5	7.1	7.7	0.0	7.9	9.6	0.1	0.2	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	14.0	14.1	3.2	12.1	11.6	2.0	7.2	7.4	4.3	3.5	3.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	64.5	53.0	53.0	64.7	48.1	48.8	28.6	56.9	58.8	26.6	41.4	41.5
LnGrp LOS	E	D	D	E	D	D	C	E	E	C	D	D
Approach Vol, veh/h	1000				892		558				493	
Approach Delay, s/veh	54.2				50.2		52.8				35.0	
Approach LOS	D				D		D				C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	2.1	36.9	42.6	28.5	12.0	37.0	48.3	22.8				
Change Period (Y+Rc), s	3.9	* 3.9	3.0	3.9	3.0	3.9	3.0	3.9				
Max Green Setting (Gmax), s	2.0	* 41	14.0	39.1	12.0	41.1	27.0	26.1				
Max Q Clear Time (g_c+1/3), s	13.5	31.4	6.7	10.3	9.2	28.3	12.3	17.6				
Green Ext Time (p_c), s	0.0	1.6	0.0	0.5	0.0	1.6	0.1	0.7				

Intersection Summary

HCM 6th Ctrl Delay 49.5

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection

Intersection Delay, s/veh 7.7

Intersection LOS A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	0	10	0	0	10	50	0	0	0	80	0	0
Future Vol, veh/h	0	10	0	0	10	50	0	0	0	80	0	0
Peak Hour Factor	0.66	0.66	0.92	0.92	0.66	0.66	0.92	0.92	0.92	0.66	0.92	0.66
Heavy Vehicles, %	3	3	2	2	3	3	2	2	2	3	2	3
Mvmt Flow	0	15	0	0	15	76	0	0	0	121	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0























Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.4	7.1	0	8.1
HCM LOS	A	A	-	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	0%	0%	100%
Vol Thru, %	100%	100%	17%	0%
Vol Right, %	0%	0%	83%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	0	10	60	80
LT Vol	0	0	0	80
Through Vol	0	10	10	0
RT Vol	0	0	50	0
Lane Flow Rate	0	15	91	121
Geometry Grp	1	1	1	1
Degree of Util (X)	0	0.018	0.093	0.146
Departure Headway (Hd)	4.212	4.235	3.674	4.334
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	0	833	960	827
Service Time	2.279	2.322	1.754	2.367
HCM Lane V/C Ratio	0	0.018	0.095	0.146
HCM Control Delay	7.3	7.4	7.1	8.1
HCM Lane LOS	N	A	A	A
HCM 95th-tile Q	0	0.1	0.3	0.5

HCM 6th Signalized Intersection Summary







1: Marlow Rd & Marlow Ct/W Steele Ln

Lance Drive Residential TIA
Near Term AM (120-140 Seconds)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	10	10	220	10	180	10	520	220	140	500	10
Future Volume (veh/h)	10	10	10	220	10	180	10	520	220	140	500	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.94	1.00		1.00	1.00		0.96	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	12	12	2	265	0	119	12	605	163	163	581	11
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	31	31	5	1793	0	963	24	750	1117	189	1076	20
Arrive On Green	0.04	0.04	0.04	0.51	0.00	0.51	0.01	0.21	0.21	0.11	0.30	0.30
Sat Flow, veh/h	822	822	137	3534	0	1566	1767	3526	1503	1767	3539	67
Grp Volume(v), veh/h	26	0	0	265	0	119	12	605	163	163	289	303
Grp Sat Flow(s),veh/h/ln	1780	0	0	1767	0	1566	1767	1763	1503	1767	1763	1843
Q Serve(g_s), s	2.0	0.0	0.0	5.6	0.0	0.0	0.9	22.8	4.8	12.7	19.1	19.1
Cycle Q Clear(g_c), s	2.0	0.0	0.0	5.6	0.0	0.0	0.9	22.8	4.8	12.7	19.1	19.1
Prop In Lane	0.46		0.08	1.00		1.00	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	67	0	0	1793	0	963	24	750	1117	189	536	561
V/C Ratio(X)	0.39	0.00	0.00	0.15	0.00	0.12	0.51	0.81	0.15	0.86	0.54	0.54
Avail Cap(c_a), veh/h	243	0	0	1793	0	963	77	992	1221	329	744	778
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.57	0.57	0.57	1.00	1.00	1.00
Uniform Delay (d), s/veh	65.8	0.0	0.0	18.4	0.0	11.3	68.6	52.4	6.2	61.5	40.5	40.6
Incr Delay (d2), s/veh	3.7	0.0	0.0	0.2	0.0	0.3	9.4	2.2	0.0	10.9	0.8	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	0.0	2.4	0.0	1.6	0.5	10.3	5.0	6.3	8.4	8.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	69.5	0.0	0.0	18.5	0.0	11.5	78.0	54.6	6.2	72.4	41.4	41.4
LnGrp LOS	E	A	A	B	A	B	E	D	A	E	D	D
Approach Vol, veh/h	26			384				780				755
Approach Delay, s/veh	69.5			16.4				44.8				48.1
Approach LOS	E			B				D				D
Timer - Assigned Phs	2		3	4		6		7	8			
Phs Duration (G+Y+Rc), s	75.6		6.8	47.5		10.1		19.9	34.4			
Change Period (Y+Rc), s	4.6		4.9	4.9		4.9		4.9	4.6			
Max Green Setting (Gmax), s	36.4		6.1	59.1		19.1		26.1	39.4			
Max Q Clear Time (g_c+I1), s	7.6		2.9	21.1		4.0		14.7	24.8			
Green Ext Time (p_c), s	1.4		0.0	3.8		0.1		0.3	4.0			
Intersection Summary												
HCM 6th Ctrl Delay	40.8											
HCM 6th LOS	D											
Notes												
User approved pedestrian interval to be less than phase max green.												
User approved volume balancing among the lanes for turning movement.												






















HCM 6th TWSC
2: Iroquois St/Apple Valley Ln & W Steele Ln

Lance Drive Residential TIA
Near Term AM (120-140 Seconds)

Intersection												
Int Delay, s/veh	5.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	30	370	50	20	310	20	50	10	30	20	10	40
Future Vol, veh/h	30	370	50	20	310	20	50	10	30	20	10	40
Conflicting Peds, #/hr	12	0	24	24	0	12	4	0	4	4	0	4
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	60	-	-	80	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	36	446	60	24	373	24	60	12	36	24	12	48
Major/Minor	Major1		Major2			Minor1			Minor2			
Conflicting Flow All	409	0	0	530	0	0	1039	1029	504	1021	1047	401
Stage 1	-	-	-	-	-	-	572	572	-	445	445	-
Stage 2	-	-	-	-	-	-	467	457	-	576	602	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1144	-	-	1032	-	-	208	233	566	214	227	647
Stage 1	-	-	-	-	-	-	503	503	-	590	573	-
Stage 2	-	-	-	-	-	-	574	566	-	501	487	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1131	-	-	1008	-	-	171	213	551	181	207	637
Mov Cap-2 Maneuver	-	-	-	-	-	-	171	213	-	181	207	-
Stage 1	-	-	-	-	-	-	476	476	-	565	553	-
Stage 2	-	-	-	-	-	-	505	546	-	440	461	-
Approach	EB		WB			NB			SB			
HCM Control Delay, s	0.6		0.5			34.1			20.5			
HCM LOS						D			C			
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	229	1131	-	-	1008	-	-	316				
HCM Lane V/C Ratio	0.474	0.032	-	-	0.024	-	-	0.267				
HCM Control Delay (s)	34.1	8.3	-	-	8.7	-	-	20.5				
HCM Lane LOS	D	A	-	-	A	-	-	C				
HCM 95th %tile Q(veh)	2.3	0.1	-	-	0.1	-	-	1.1				

HCM 6th Signalized Intersection Summary 3: Range Ave & W Steele Ln

Lance Drive Residential TIA
Near Term AM (120-140 Seconds)












												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	420	60	50	280	40	40	170	30	30	150	30
Future Volume (veh/h)	40	420	60	50	280	40	40	170	30	30	150	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.95	1.00		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	45	477	66	57	318	43	45	193	20	34	170	18
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	784	1243	172	638	1245	168	58	362	37	46	360	37
Arrive On Green	0.78	0.78	0.78	0.78	0.78	0.78	0.03	0.11	0.11	0.03	0.11	0.11
Sat Flow, veh/h	1011	1594	221	856	1597	216	1767	3210	328	1767	3199	333
Grp Volume(v), veh/h	45	0	543	57	0	361	45	105	108	34	92	96
Grp Sat Flow(s),veh/h/ln	1011	0	1815	856	0	1813	1767	1763	1775	1767	1763	1770
Q Serve(g_s), s	1.8	0.0	13.2	3.1	0.0	7.7	3.5	7.8	8.1	2.7	6.9	7.1
Cycle Q Clear(g_c), s	9.5	0.0	13.2	16.3	0.0	7.7	3.5	7.8	8.1	2.7	6.9	7.1
Prop In Lane	1.00		0.12	1.00		0.12	1.00		0.18	1.00		0.19
Lane Grp Cap(c), veh/h	784	0	1415	638	0	1413	58	199	200	46	198	199
V/C Ratio(X)	0.06	0.00	0.38	0.09	0.00	0.26	0.78	0.53	0.54	0.73	0.47	0.48
Avail Cap(c_a), veh/h	784	0	1415	638	0	1413	189	404	407	126	341	343
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.78	0.78	0.78	1.00	1.00	1.00
Uniform Delay (d), s/veh	5.5	0.0	4.8	7.4	0.0	4.2	67.2	58.6	58.7	67.7	58.2	58.3
Incr Delay (d2), s/veh	0.1	0.0	0.8	0.3	0.0	0.4	6.4	0.6	0.7	8.1	0.6	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	4.5	0.6	0.0	2.6	1.7	3.5	3.6	1.3	3.1	3.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	5.7	0.0	5.6	7.7	0.0	4.7	73.6	59.2	59.4	75.7	58.8	58.9
LnGrp LOS	A	A	A	A	A	A	E	E	E	E	E	E
Approach Vol, veh/h		588			418			258			222	
Approach Delay, s/veh		5.6			5.1			61.8			61.5	
Approach LOS		A			A			E			E	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		112.8	7.6	19.7		112.8	7.6	19.7				
Change Period (Y+Rc), s		3.6	3.0	3.9		3.6	3.9	* 3.9				
Max Green Setting (Gmax), s		87.4	15.0	27.1		87.4	10.0	* 32				
Max Q Clear Time (g_c+I1), s		15.2	5.5	9.1		18.3	4.7	10.1				
Green Ext Time (p_c), s		1.2	0.0	0.3		0.9	0.0	0.3				
Intersection Summary												
HCM 6th Ctrl Delay			23.6									
HCM 6th LOS			C									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

HCM 6th Signalized Intersection Summary

4: Marlow Rd & Guerneville Rd

Lance Drive Residential TIA
Near Term AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	120	440	150	150	280	100	130	480	170	110	500	90
Future Volume (veh/h)	120	440	150	150	280	100	130	480	170	110	500	90
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	130	478	97	163	304	83	141	522	62	120	543	85
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	156	607	416	190	534	143	167	645	451	223	654	102
Arrive On Green	0.09	0.17	0.17	0.11	0.19	0.19	0.09	0.18	0.18	0.13	0.21	0.21
Sat Flow, veh/h	1767	3526	1556	1767	2742	736	1767	3526	1539	1767	3046	475
Grp Volume(v), veh/h	130	478	97	163	193	194	141	522	62	120	313	315
Grp Sat Flow(s),veh/h/ln	1767	1763	1556	1767	1763	1715	1767	1763	1539	1767	1763	1758
Q Serve(g_s), s	9.4	16.9	2.2	11.8	12.9	13.3	10.2	18.5	0.0	8.3	22.1	22.3
Cycle Q Clear(g_c), s	9.4	16.9	2.2	11.8	12.9	13.3	10.2	18.5	0.0	8.3	22.1	22.3
Prop In Lane	1.00		1.00	1.00		0.43	1.00		1.00	1.00		0.27
Lane Grp Cap(c), veh/h	156	607	416	190	344	334	167	645	451	223	379	378
V/C Ratio(X)	0.84	0.79	0.23	0.86	0.56	0.58	0.85	0.81	0.14	0.54	0.83	0.83
Avail Cap(c_a), veh/h	241	849	523	295	479	466	227	995	604	254	525	523
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.99	0.99	0.99	0.60	0.60	0.60	0.91	0.91	0.91
Uniform Delay (d), s/veh	58.3	51.5	6.1	57.0	47.3	47.5	57.9	50.9	34.0	53.3	48.7	48.8
Incr Delay (d2), s/veh	13.8	3.3	0.3	13.8	6.5	7.1	12.3	1.8	0.1	1.8	7.0	7.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.7	7.6	1.8	5.9	6.2	6.3	5.1	8.2	1.4	3.8	10.4	10.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	72.1	54.8	6.4	70.9	53.8	54.6	70.2	52.7	34.1	55.1	55.8	56.2
LnGrp LOS	E	D	A	E	D	D	E	D	C	E	E	E
Approach Vol, veh/h	705				550		725				748	
Approach Delay, s/veh	51.4				59.1		54.5				55.9	
Approach LOS	D				E		D				E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	28.1	17.6	33.2	16.8	31.0	21.7	29.1					
Change Period (Y+Rc), s	5.7	5.7	5.3	5.3	5.3	5.7	5.3	5.3				
Max Green Setting (Gmax), s	31	31	16.7	38.7	17.7	35.3	18.7	36.7				
Max Q Clear Time (g_c+I1), s	18.9	18.9	12.2	24.3	11.4	15.3	10.3	20.5				
Green Ext Time (p_c), s	0.2	2.6	0.1	3.2	0.1	2.0	0.2	3.1				

Intersection Summary

HCM 6th Ctrl Delay 55.0

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.







* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary

5: Ridley Ave & Guerneville Rd

Lance Drive Residential TIA
Near Term AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	700	30	60	440	20	40	10	60	40	10	30
Future Volume (veh/h)	30	700	30	60	440	20	40	10	60	40	10	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	0.98		0.96	0.98		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	34	787	33	67	494	21	45	11	19	45	11	9
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	805	2960	124	592	2961	126	118	31	37	133	32	19
Arrive On Green	0.86	0.86	0.86	1.00	1.00	1.00	0.09	0.09	0.09	0.09	0.09	0.09
Sat Flow, veh/h	877	3444	144	661	3445	146	840	342	401	976	347	213
Grp Volume(v), veh/h	34	403	417	67	252	263	75	0	0	65	0	0
Grp Sat Flow(s),veh/h/ln	877	1763	1825	661	1763	1829	1583	0	0	1536	0	0
Q Serve(g_s), s	0.8	5.8	5.8	0.8	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.8	5.8	5.8	6.6	0.0	0.0	5.7	0.0	0.0	5.2	0.0	0.0
Prop In Lane	1.00		0.08	1.00		0.08	0.60		0.25	0.69		0.14
Lane Grp Cap(c), veh/h	805	1515	1569	592	1515	1572	186	0	0	184	0	0
V/C Ratio(X)	0.04	0.27	0.27	0.11	0.17	0.17	0.40	0.00	0.00	0.35	0.00	0.00
Avail Cap(c_a), veh/h	805	1515	1569	592	1515	1572	499	0	0	494	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.93	0.93	0.93	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	1.4	1.8	1.8	0.2	0.0	0.0	60.4	0.0	0.0	60.1	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.4	0.4	0.0	0.0	0.0	0.5	0.0	0.0	0.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	1.3	1.3	0.0	0.0	0.0	2.6	0.0	0.0	2.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	1.5	2.2	2.2	0.2	0.0	0.0	60.9	0.0	0.0	60.6	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	E	A	A	E	A	A
Approach Vol, veh/h	854		582			75			65			
Approach Delay, s/veh	2.2		0.0			60.9			60.6			
Approach LOS	A		A			E			E			
Timer - Assigned Phs	2		4			6			8			
Phs Duration (G+Y+Rc), s	124.2		15.8			124.2			15.8			
Change Period (Y+Rc), s	3.9		3.0			3.9			3.0			
Max Green Setting (Gmax), s	90.1		43.0			90.1			43.0			
Max Q Clear Time (g_c+I1), s	7.8		7.2			8.6			7.7			
Green Ext Time (p_c), s	1.6		0.2			1.2			0.2			
Intersection Summary												
HCM 6th Ctrl Delay	6.6											
HCM 6th LOS	A											

HCM 6th Signalized Intersection Summary 6: Lance Dr & Guerneville Rd

Lance Drive Residential TIA
Near Term AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	750	30	30	440	50	20	50	70	60	80	60
Future Volume (veh/h)	30	750	30	30	440	50	20	50	70	60	80	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.99	0.99		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	36	893	35	36	524	40	24	60	47	71	95	56
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	57	926	36	67	964	420	61	140	95	106	120	65
Arrive On Green	0.06	0.54	0.54	0.01	0.09	0.09	0.17	0.17	0.17	0.17	0.17	0.17
Sat Flow, veh/h	1767	3455	135	1767	3526	1536	183	846	576	433	725	391
Grp Volume(v), veh/h	36	456	472	36	524	40	131	0	0	222	0	0
Grp Sat Flow(s), veh/h/ln	1767	1763	1827	1767	1763	1536	1605	0	0	1548	0	0
Q Serve(g_s), s	2.8	34.8	34.8	2.8	19.9	3.3	0.0	0.0	0.0	9.8	0.0	0.0
Cycle Q Clear(g_c), s	2.8	34.8	34.8	2.8	19.9	3.3	9.8	0.0	0.0	19.6	0.0	0.0
Prop In Lane	1.00		0.07	1.00		1.00	0.18		0.36	0.32		0.25
Lane Grp Cap(c), veh/h	57	472	490	67	964	420	296	0	0	290	0	0
V/C Ratio(X)	0.63	0.96	0.96	0.54	0.54	0.10	0.44	0.00	0.00	0.77	0.00	0.00
Avail Cap(c_a), veh/h	135	852	884	135	1705	743	561	0	0	548	0	0
HCM Platoon Ratio	2.00	2.00	2.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.97	0.97	0.97	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	64.7	31.8	31.8	67.9	55.3	47.8	52.8	0.0	0.0	56.9	0.0	0.0
Incr Delay (d2), s/veh	4.2	9.4	9.1	2.4	2.1	0.4	0.4	0.0	0.0	1.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	12.0	12.4	1.3	9.7	1.3	4.3	0.0	0.0	7.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	68.9	41.2	41.0	70.4	57.5	48.2	53.2	0.0	0.0	58.5	0.0	0.0
LnGrp LOS	E	D	D	E	E	D	D	A	A	E	A	A
Approach Vol, veh/h	964			600			131			222		
Approach Delay, s/veh	42.1			57.6			53.2			58.5		
Approach LOS	D			E			D			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	42.8			27.7	9.8	43.6		27.7				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		4.6				
Max Green Setting (Gmax), s	67.7			46.4	10.7	67.7		46.4				
Max Q Clear Time (g_c+14), s	36.8			21.6	4.8	21.9		11.8				
Green Ext Time (p_c), s	0.0	0.8		0.3	0.0	0.6		0.2				

Intersection Summary

HCM 6th Ctrl Delay 49.6
HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

7: N Dutton Ave/Westberry Dr & Guerneville Rd

Lance Drive Residential TIA
Near Term AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	850	110	250	460	10	90	10	380	20	10	10
Future Volume (veh/h)	10	850	110	250	460	10	90	10	380	20	10	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.99	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	12	1024	127	301	554	11	117	0	147	24	12	1
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	28	1069	132	1460	2648	53	166	0	743	48	24	2
Arrive On Green	0.02	0.34	0.34	0.85	1.00	1.00	0.05	0.00	0.05	0.04	0.04	0.04
Sat Flow, veh/h	1767	3149	390	3428	3533	70	3534	0	1562	1159	580	48
Grp Volume(v), veh/h	12	573	578	301	276	289	117	0	147	37	0	0
Grp Sat Flow(s), veh/h/ln	1767	1763	1777	1714	1763	1841	1767	0	1562	1787	0	0
Q Serve(g_s), s	0.9	44.5	44.6	2.2	0.0	0.0	4.6	0.0	0.0	2.8	0.0	0.0
Cycle Q Clear(g_c), s	0.9	44.5	44.6	2.2	0.0	0.0	4.6	0.0	0.0	2.8	0.0	0.0
Prop In Lane	1.00		0.22	1.00		0.04	1.00		1.00	0.65		0.03
Lane Grp Cap(c), veh/h	28	598	603	1460	1321	1379	166	0	743	74	0	0
V/C Ratio(X)	0.42	0.96	0.96	0.21	0.21	0.21	0.70	0.00	0.20	0.50	0.00	0.00
Avail Cap(c_a), veh/h	77	698	703	1460	1321	1379	220	0	767	354	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.93	0.93	0.93	0.95	0.95	0.95	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	68.2	45.2	45.3	6.1	0.0	0.0	65.8	0.0	21.5	65.7	0.0	0.0
Incr Delay (d2), s/veh	3.5	26.4	26.5	0.0	0.3	0.3	3.5	0.0	0.0	2.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	23.4	23.6	0.8	0.1	0.1	2.1	0.0	2.8	1.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	71.7	71.6	71.8	6.1	0.3	0.3	69.3	0.0	21.5	67.7	0.0	0.0
LnGrp LOS	E	E	E	A	A	A	E	A	C	E	A	A
Approach Vol, veh/h	1163			866			264			37		
Approach Delay, s/veh	71.7			2.4			42.7			67.7		
Approach LOS	E			A			D			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	64.9	52.8		10.4	7.5	110.2		11.9				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		5.3				
Max Green Setting (Gmax), s	77.3	55.4		27.7	6.1	77.0		8.7				
Max Q Clear Time (g_c+14.2), s	46.6	46.6		4.8	2.9	2.0		6.6				
Green Ext Time (p_c), s	0.0	0.9		0.0	0.0	0.4		0.0				

Intersection Summary

HCM 6th Ctrl Delay 42.6

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

8: Herbert St/Coffey Ln & Guerneville Rd

Lance Drive Residential TIA
Near Term AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	140	1080	30	20	530	40	20	20	20	80	10	160
Future Volume (veh/h)	140	1080	30	20	530	40	20	20	20	80	10	160
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		0.96	1.00		0.93	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	163	1256	34	23	616	44	23	23	6	93	12	39
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	184	1279	35	609	2015	144	45	45	12	139	18	297
Arrive On Green	0.21	0.73	0.73	0.34	0.61	0.61	0.06	0.06	0.06	0.09	0.09	0.09
Sat Flow, veh/h	1767	3501	95	1767	3326	237	780	780	203	1574	203	1508
Grp Volume(v), veh/h	163	632	658	23	326	334	52	0	0	105	0	39
Grp Sat Flow(s), veh/h/ln	1767	1763	1833	1767	1763	1800	1763	0	0	1777	0	1508
Q Serve(g_s), s	12.5	47.8	48.1	1.2	12.5	12.6	4.0	0.0	0.0	8.0	0.0	3.0
Cycle Q Clear(g_c), s	12.5	47.8	48.1	1.2	12.5	12.6	4.0	0.0	0.0	8.0	0.0	3.0
Prop In Lane	1.00		0.05	1.00		0.13	0.44		0.12	0.89		1.00
Lane Grp Cap(c), veh/h	184	644	669	609	1068	1091	103	0	0	157	0	297
V/C Ratio(X)	0.89	0.98	0.98	0.04	0.31	0.31	0.51	0.00	0.00	0.67	0.00	0.13
Avail Cap(c_a), veh/h	263	786	817	609	1068	1091	316	0	0	334	0	447
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.75	0.75	0.75	0.95	0.95	0.95	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	54.7	18.4	18.5	30.5	13.3	13.4	64.0	0.0	0.0	61.8	0.0	46.9
Incr Delay (d2), s/veh	13.8	26.6	26.3	0.0	0.7	0.7	1.4	0.0	0.0	1.8	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.6	13.3	13.8	0.5	5.0	5.1	1.9	0.0	0.0	3.7	0.0	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	68.5	45.0	44.8	30.5	14.0	14.0	65.4	0.0	0.0	63.6	0.0	46.9
LnGrp LOS	E	D	D	C	B	B	E	A	A	E	A	D
Approach Vol, veh/h	1453			683			52			144		
Approach Delay, s/veh	47.5			14.6			65.4			59.1		
Approach LOS	D			B			E			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	53.5	56.4		17.3	19.8	90.1		12.7				
Change Period (Y+Rc), s	5.3	5.3		4.9	5.3	5.3		4.6				
Max Green Setting (Gmax), s	62.4	62.4		26.3	20.8	47.7		25.1				
Max Q Clear Time (g_c+I1), s	50.1	50.1		10.0	14.5	14.6		6.0				
Green Ext Time (p_c), s	0.0	1.1		0.1	0.0	0.5		0.0				
Intersection Summary												
HCM 6th Ctrl Delay	39.0											
HCM 6th LOS	D											

HCM 6th Signalized Intersection Summary

9: Range Ave & Guerneville Rd

Lance Drive Residential TIA
Near Term AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	150	710	150	70	410	10	130	90	80	40	100	110
Future Volume (veh/h)	150	710	150	70	410	10	130	90	80	40	100	110
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.96	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	160	755	0	74	436	0	81	176	8	43	106	8
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	228	826		94	559		158	315	14	103	192	14
Arrive On Green	0.13	0.23	0.00	0.05	0.16	0.00	0.09	0.09	0.09	0.06	0.06	0.06
Sat Flow, veh/h	1767	3618	0	1767	3618	0	1767	3516	159	1767	3312	247
Grp Volume(v), veh/h	160	755	0	74	436	0	81	92	92	43	56	58
Grp Sat Flow(s), veh/h/ln	1767	1763	0	1767	1763	0	1767	1856	1820	1767	1763	1796
Q Serve(g_s), s	10.4	25.0	0.0	5.0	14.2	0.0	5.2	5.7	5.8	2.8	3.7	3.8
Cycle Q Clear(g_c), s	10.4	25.0	0.0	5.0	14.2	0.0	5.2	5.7	5.8	2.8	3.7	3.8
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.09	1.00		0.14
Lane Grp Cap(c), veh/h	228	826		94	559		158	166	163	103	102	104
V/C Ratio(X)	0.70	0.91		0.79	0.78		0.51	0.56	0.56	0.42	0.55	0.56
Avail Cap(c_a), veh/h	275	1307		158	1072		492	516	506	161	160	163
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.83	0.83	0.00	0.98	0.98	0.00	1.00	1.00	1.00	0.80	0.80	0.80
Uniform Delay (d), s/veh	50.1	44.8	0.0	56.1	48.5	0.0	52.1	52.3	52.4	54.6	55.0	55.0
Incr Delay (d2), s/veh	3.5	3.9	0.0	5.3	10.1	0.0	0.9	1.1	1.1	0.8	1.3	1.4
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.7	11.1	0.0	2.3	7.0	0.0	2.4	2.7	2.7	1.3	1.7	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	53.5	48.6	0.0	61.4	58.6	0.0	53.1	53.4	53.5	55.4	56.3	56.4
LnGrp LOS	D	D		E	E		D	D	D	E	E	E
Approach Vol, veh/h	915		A	510		A	265		157			
Approach Delay, s/veh	49.5			59.0			53.3		56.1			
Approach LOS	D			E			D		E			
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	1.7	33.4		12.3	20.8	24.3		15.4				
Change Period (Y+Rc), s	5.3	5.3		5.3	5.3	5.3		4.6				
Max Green Setting (Gmax), s	44.5	44.5		10.9	18.7	36.5		33.4				
Max Q Clear Time (g_c+11), s	27.0	27.0		5.8	12.4	16.2		7.8				
Green Ext Time (p_c), s	0.0	0.9		0.0	0.0	0.5		0.1				

Intersection Summary

HCM 6th Ctrl Delay 53.2

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

10: Guerneville Rd & Steele Wy

Lance Drive Residential TIA
Near Term AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	760	50	60	450	10	30	10	60	390	20	10
Future Volume (veh/h)	30	760	50	60	450	10	30	10	60	390	20	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	34	864	37	68	511	10	22	27	6	459	0	3
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	894	2178	1049	171	572	11	88	93	156	511	0	1022
Arrive On Green	0.51	0.62	0.62	0.05	0.16	0.16	0.05	0.05	0.05	0.14	0.00	0.14
Sat Flow, veh/h	1767	3526	1571	3428	3534	69	1767	1856	1554	3534	0	1566
Grp Volume(v), veh/h	34	864	37	68	255	266	22	27	6	459	0	3
Grp Sat Flow(s), veh/h/ln	1767	1763	1571	1714	1763	1841	1767	1856	1554	1767	0	1566
Q Serve(g_s), s	1.4	17.4	1.1	2.7	19.8	19.9	1.7	2.0	0.5	17.9	0.0	0.0
Cycle Q Clear(g_c), s	1.4	17.4	1.1	2.7	19.8	19.9	1.7	2.0	0.5	17.9	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.04	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	894	2178	1049	171	285	298	88	93	156	511	0	1022
V/C Ratio(X)	0.04	0.40	0.04	0.40	0.89	0.89	0.25	0.29	0.04	0.90	0.00	0.00
Avail Cap(c_a), veh/h	894	2178	1049	198	631	659	346	363	383	886	0	1188
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.91	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.4	13.5	7.9	64.5	57.5	57.5	64.0	64.1	56.9	58.9	0.0	8.6
Incr Delay (d2), s/veh	0.0	0.5	0.1	0.6	3.9	3.8	0.5	0.6	0.0	3.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	6.9	0.5	1.2	9.1	9.5	0.8	1.0	0.2	8.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.4	14.0	8.0	65.0	61.3	61.3	64.5	64.8	57.0	62.2	0.0	8.6
LnGrp LOS	B	B	A	E	E	E	E	E	E	E	A	A
Approach Vol, veh/h	935			589			55			462		
Approach Delay, s/veh	13.9			61.7			63.8			61.8		
Approach LOS	B			E			E			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	1.9	91.4		25.1	75.7	27.6		11.6				
Change Period (Y+Rc), s	4.9	4.9		4.9	4.9	4.9		4.6				
Max Green Setting (Gmax), s	50.1			35.1	8.1	50.1		27.4				
Max Q Clear Time (g_c+14), s	19.4			19.9	3.4	21.9		4.0				
Green Ext Time (p_c), s	0.0	1.2		0.1	0.0	0.5		0.0				

Intersection Summary

HCM 6th Ctrl Delay 39.9

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

11: Cleveland Ave & Guerneville Rd

Lance Drive Residential TIA
Near Term AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰ ↱	↑ ↑ ↑		↰ ↱	↑ ↑	↰	↰	↑ ↑		↰	↑ ↑	
Traffic Volume (veh/h)	60	1150	40	180	820	190	30	90	150	230	70	40
Future Volume (veh/h)	60	1150	40	180	820	190	30	90	150	230	70	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	66	1264	41	198	901	109	33	99	58	253	77	28
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	237	1361	44	244	961	418	745	923	502	342	125	45
Arrive On Green	0.07	0.27	0.27	0.07	0.27	0.27	0.42	0.42	0.42	0.10	0.10	0.10
Sat Flow, veh/h	3428	5036	163	3428	3526	1535	1767	2190	1190	3534	1291	469
Grp Volume(v), veh/h	66	848	457	198	901	109	33	78	79	253	0	105
Grp Sat Flow(s), veh/h/ln	1714	1689	1822	1714	1763	1535	1767	1763	1617	1767	0	1761
Q Serve(g_s), s	2.6	34.2	34.2	8.0	35.0	7.8	1.5	3.8	4.1	9.7	0.0	8.0
Cycle Q Clear(g_c), s	2.6	34.2	34.2	8.0	35.0	7.8	1.5	3.8	4.1	9.7	0.0	8.0
Prop In Lane	1.00		0.09	1.00		1.00	1.00		0.74	1.00		0.27
Lane Grp Cap(c), veh/h	237	913	492	244	961	418	745	743	682	342	0	171
V/C Ratio(X)	0.28	0.93	0.93	0.81	0.94	0.26	0.04	0.11	0.12	0.74	0.00	0.62
Avail Cap(c_a), veh/h	237	1257	678	394	1488	648	745	743	682	1088	0	542
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.74	0.74	0.74	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	61.9	49.8	49.8	64.1	49.8	39.9	23.9	24.5	24.6	61.5	0.0	60.7
Incr Delay (d2), s/veh	0.2	8.2	13.5	1.9	4.9	0.1	0.1	0.3	0.3	1.2	0.0	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	15.3	17.3	3.5	15.9	3.0	0.7	1.7	1.7	4.4	0.0	3.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	62.1	58.0	63.3	66.0	54.6	40.0	24.0	24.8	25.0	62.7	0.0	62.1
LnGrp LOS	E	E	E	E	D	D	C	C	C	E	A	E
Approach Vol, veh/h	1371			1208			190			358		
Approach Delay, s/veh	59.9			55.2			24.7			62.5		
Approach LOS	E			E			C			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.9	42.7		63.9	14.6	43.1		18.5				
Change Period (Y+Rc), s	4.9	4.9		4.9	4.9	4.9		4.9				
Max Green Setting (Gmax), s	4.9	52.1		9.1	9.1	59.1		43.1				
Max Q Clear Time (g_c+I10), s	4.9	36.2		6.1	4.6	37.0		11.7				
Green Ext Time (p_c), s	0.0	1.6		0.0	0.0	1.2		0.1				

Intersection Summary

HCM 6th Ctrl Delay	56.3
HCM 6th LOS	E

Notes

User approved pedestrian interval to be less than phase max green.
User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 12: US 101 SB Ramps & Guerneville Rd

Lance Drive Residential TIA
Near Term AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑					↑	↑	↑
Traffic Volume (veh/h)	0	1020	500	260	900	0	0	0	0	350	10	280
Future Volume (veh/h)	0	1020	500	260	900	0	0	0	0	350	10	280
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1856	1856	1856	1856	0				1856	1856	1856
Adj Flow Rate, veh/h	0	1146	152	292	1011	0				401	0	258
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89				0.89	0.89	0.89
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	1249	381	338	1340	0				1951	0	868
Arrive On Green	0.00	0.25	0.25	0.10	0.38	0.00				0.55	0.00	0.55
Sat Flow, veh/h	0	5233	1543	3428	3618	0				3534	0	1572
Grp Volume(v), veh/h	0	1146	152	292	1011	0				401	0	258
Grp Sat Flow(s),veh/h/ln	0	1689	1543	1714	1763	0				1767	0	1572
Q Serve(g_s), s	0.0	30.8	11.5	11.8	34.9	0.0				8.0	0.0	12.3
Cycle Q Clear(g_c), s	0.0	30.8	11.5	11.8	34.9	0.0				8.0	0.0	12.3
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1249	381	338	1340	0				1951	0	868
V/C Ratio(X)	0.00	0.92	0.40	0.86	0.75	0.00				0.21	0.00	0.30
Avail Cap(c_a), veh/h	0	2066	629	566	2143	0				1951	0	868
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.36	0.36	0.84	0.84	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	51.4	44.1	62.2	37.7	0.0				15.8	0.0	16.8
Incr Delay (d2), s/veh	0.0	1.0	0.1	3.0	0.3	0.0				0.2	0.0	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	13.0	4.4	5.2	14.9	0.0				3.2	0.0	4.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	52.4	44.2	65.2	38.0	0.0				16.1	0.0	17.7
LnGrp LOS	A	D	D	E	D	A				B	A	B
Approach Vol, veh/h		1298			1303						659	
Approach Delay, s/veh		51.4			44.1						16.7	
Approach LOS		D			D						B	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	8.7	39.4		81.9		58.1						
Change Period (Y+Rc), s	4.9	4.9		4.6		4.9						
Max Green Setting (Gmax), s	28.5	57.1		45.4		85.1						
Max Q Clear Time (g_c+I1), s	13.8	32.8		14.3		36.9						
Green Ext Time (p_c), s	0.0	1.7		0.1		1.4						

Intersection Summary

HCM 6th Ctrl Delay 41.5
HCM 6th LOS D

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 13: US 101 NB Ramps & Guerneville Rd/Steele Ln

Lance Drive Residential TIA
Near Term AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↑↑			↑↑↑		↰	↰↱	↰			
Traffic Volume (veh/h)	380	990	0	0	800	210	360	10	420	0	0	0
Future Volume (veh/h)	380	990	0	0	800	210	360	10	420	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1856	1856	0	0	1856	1856	1856	1856	1856			
Adj Flow Rate, veh/h	427	1112	0	0	899	207	515	0	231			
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89			
Percent Heavy Veh, %	3	3	0	0	3	3	3	3	3			
Cap, veh/h	1707	2724	0	0	982	225	564	0	251			
Arrive On Green	1.00	1.00	0.00	0.00	0.24	0.24	0.16	0.00	0.16			
Sat Flow, veh/h	3428	3618	0	0	4263	938	3534	0	1572			
Grp Volume(v), veh/h	427	1112	0	0	740	366	515	0	231			
Grp Sat Flow(s),veh/h/ln	1714	1763	0	0	1689	1657	1767	0	1572			
Q Serve(g_s), s	0.1	0.0	0.0	0.0	29.9	30.1	20.1	0.0	20.3			
Cycle Q Clear(g_c), s	0.1	0.0	0.0	0.0	29.9	30.1	20.1	0.0	20.3			
Prop In Lane	1.00		0.00	0.00		0.57	1.00		1.00			
Lane Grp Cap(c), veh/h	1707	2724	0	0	809	397	564	0	251			
V/C Ratio(X)	0.25	0.41	0.00	0.00	0.91	0.92	0.91	0.00	0.92			
Avail Cap(c_a), veh/h	1707	2724	0	0	1209	593	1171	0	521			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.56	0.56	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.1	0.0	0.0	0.0	51.8	51.9	57.9	0.0	58.0			
Incr Delay (d2), s/veh	0.0	0.3	0.0	0.0	5.9	11.7	2.5	0.0	5.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.0	0.1	0.0	0.0	13.2	13.7	9.0	0.0	8.3			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.2	0.3	0.0	0.0	57.8	63.6	60.4	0.0	63.7			
LnGrp LOS	A	A	A	A	E	E	E	A	E			
Approach Vol, veh/h	1539			1106			746					
Approach Delay, s/veh	0.2			59.7			61.4					
Approach LOS	A			E			E					
Timer - Assigned Phs	2			5			6			8		
Phs Duration (G+Y+Rc), s	113.1			74.6			38.4			26.9		
Change Period (Y+Rc), s	4.9			4.9			4.9			4.6		
Max Green Setting (Gmax), s	84.1			29.1			50.1			46.4		
Max Q Clear Time (g_c+I1), s	2.0			2.1			32.1			22.3		
Green Ext Time (p_c), s	1.6			0.1			1.4			0.1		

Intersection Summary

HCM 6th Ctrl Delay	33.1
HCM 6th LOS	C










Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 14: Stony Point Rd/Marlow Rd & W College Ave

Lance Drive Residential TIA
Near Term AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	370	150	160	200	130	80	580	160	180	560	70
Future Volume (veh/h)	90	370	150	160	200	130	80	580	160	180	560	70
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	100	411	129	178	222	50	89	644	95	200	622	69
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	513	478	148	574	620	137	110	757	841	225	893	99
Arrive On Green	0.29	0.18	0.18	0.32	0.22	0.22	0.06	0.21	0.21	0.13	0.28	0.28
Sat Flow, veh/h	1767	2635	817	1767	2868	633	1767	3526	1538	1767	3192	353
Grp Volume(v), veh/h	100	273	267	178	135	137	89	644	95	200	343	348
Grp Sat Flow(s),veh/h/ln	1767	1763	1689	1767	1763	1737	1767	1763	1538	1767	1763	1783
Q Serve(g_s), s	6.0	21.0	21.5	10.6	9.1	9.4	7.0	24.6	2.0	15.6	24.4	24.5
Cycle Q Clear(g_c), s	6.0	21.0	21.5	10.6	9.1	9.4	7.0	24.6	2.0	15.6	24.4	24.5
Prop In Lane	1.00		0.48	1.00		0.36	1.00		1.00	1.00		0.20
Lane Grp Cap(c), veh/h	513	320	306	574	381	376	110	757	841	225	493	499
V/C Ratio(X)	0.20	0.86	0.87	0.31	0.35	0.37	0.81	0.85	0.11	0.89	0.70	0.70
Avail Cap(c_a), veh/h	513	387	370	574	512	505	173	975	936	299	613	620
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.54	0.54	0.54	1.00	1.00	1.00	0.68	0.68	0.68
Uniform Delay (d), s/veh	37.4	55.5	55.7	35.5	46.6	46.7	64.8	52.8	5.6	60.1	45.1	45.1
Incr Delay (d2), s/veh	0.2	14.7	17.1	0.2	0.3	0.3	14.0	5.8	0.1	15.7	1.7	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	10.5	10.5	4.6	4.0	4.1	3.5	11.3	0.8	7.9	10.7	10.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.6	70.2	72.8	35.6	46.9	47.0	78.8	58.6	5.7	75.8	46.8	46.8
LnGrp LOS	D	E	E	D	D	D	E	E	A	E	D	D
Approach Vol, veh/h	640				450		828				891	
Approach Delay, s/veh	66.2				42.5		54.7				53.3	
Approach LOS	E				D		D				D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	50.8	30.7	14.0	44.5	45.9	35.6	23.1	35.4				
Change Period (Y+Rc), s	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3				
Max Green Setting (Gmax), s	25.3	30.7	13.7	48.7	15.7	40.7	23.7	38.7				
Max Q Clear Time (g_c+I1), s	11.6	23.5	9.0	26.5	8.0	11.4	17.6	26.6				
Green Ext Time (p_c), s	0.4	1.8	0.1	4.0	0.1	1.5	0.3	3.5				

Intersection Summary

HCM 6th Ctrl Delay 54.9

HCM 6th LOS D

Notes









User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

15: N Dutton Ave & W College Ave

Lance Drive Residential TIA
Near Term AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	730	110	90	520	280	90	350	100	200	220	60
Future Volume (veh/h)	100	730	110	90	520	280	90	350	100	200	220	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	108	785	107	97	559	236	97	376	85	215	237	41
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	130	847	115	118	657	277	632	434	97	712	594	101
Arrive On Green	0.07	0.27	0.27	0.07	0.27	0.27	0.36	0.15	0.15	0.40	0.20	0.20
Sat Flow, veh/h	1767	3108	424	1767	2413	1016	1767	2850	636	1767	3003	511
Grp Volume(v), veh/h	108	445	447	97	408	387	97	231	230	215	137	141
Grp Sat Flow(s),veh/h/ln	1767	1763	1769	1767	1763	1666	1767	1763	1723	1767	1763	1751
Q Serve(g_s), s	8.4	34.4	34.4	7.6	30.7	30.8	5.2	17.9	18.3	11.6	9.5	9.8
Cycle Q Clear(g_c), s	8.4	34.4	34.4	7.6	30.7	30.8	5.2	17.9	18.3	11.6	9.5	9.8
Prop In Lane	1.00		0.24	1.00		0.61	1.00		0.37	1.00		0.29
Lane Grp Cap(c), veh/h	130	480	482	118	480	454	632	269	263	712	349	346
V/C Ratio(X)	0.83	0.93	0.93	0.82	0.85	0.85	0.15	0.86	0.88	0.30	0.39	0.41
Avail Cap(c_a), veh/h	189	618	620	252	681	644	632	530	518	712	568	564
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.63	0.63	0.63	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	64.0	49.6	49.6	64.5	48.2	48.3	30.5	57.9	58.0	28.4	48.9	49.0
Incr Delay (d2), s/veh	8.1	10.9	10.9	5.2	5.2	5.6	0.0	3.1	3.7	0.1	0.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	16.5	16.5	3.6	14.1	13.4	2.3	8.2	8.2	4.9	4.2	4.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	72.1	60.5	60.5	69.6	53.4	53.9	30.6	61.0	61.7	28.5	49.1	49.3
LnGrp LOS	E	E	E	E	D	D	C	E	E	C	D	D
Approach Vol, veh/h	1000				892		558				493	
Approach Delay, s/veh	61.7				55.4		56.0				40.2	
Approach LOS	E				E		E				D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	42.0	42.0	53.1	31.6	13.3	42.0	59.4	25.2				
Change Period (Y+Rc), s	3.9	* 3.9	3.0	3.9	3.0	3.9	3.0	3.9				
Max Green Setting (Gmax), s	49.0	* 49	12.0	45.1	15.0	54.1	15.0	42.1				
Max Q Clear Time (g_c+1.0), s	36.4	36.4	7.2	11.8	10.4	32.8	13.6	20.3				
Green Ext Time (p_c), s	0.0	1.7	0.0	0.5	0.0	1.7	0.0	0.9				

Intersection Summary

HCM 6th Ctrl Delay 55.1

HCM 6th LOS E

Notes





User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection

Intersection Delay, s/veh 7.7

Intersection LOS A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	10	0	0	10	50	0	0	0	80	0	0
Future Vol, veh/h	0	10	0	0	10	50	0	0	0	80	0	0
Peak Hour Factor	0.66	0.66	0.92	0.92	0.66	0.66	0.92	0.92	0.92	0.66	0.92	0.66
Heavy Vehicles, %	3	3	2	2	3	3	2	2	2	3	2	3
Mvmt Flow	0	15	0	0	15	76	0	0	0	121	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0























Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.4	7.1	0	8.1
HCM LOS	A	A	-	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	0%	0%	100%
Vol Thru, %	100%	100%	17%	0%
Vol Right, %	0%	0%	83%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	0	10	60	80
LT Vol	0	0	0	80
Through Vol	0	10	10	0
RT Vol	0	0	50	0
Lane Flow Rate	0	15	91	121
Geometry Grp	1	1	1	1
Degree of Util (X)	0	0.018	0.093	0.146
Departure Headway (Hd)	4.212	4.235	3.674	4.334
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	0	833	960	827
Service Time	2.279	2.322	1.754	2.367
HCM Lane V/C Ratio	0	0.018	0.095	0.146
HCM Control Delay	7.3	7.4	7.1	8.1
HCM Lane LOS	N	A	A	A
HCM 95th-tile Q	0	0.1	0.3	0.5

HCM 6th Signalized Intersection Summary







1: Marlow Rd & Marlow Ct/W Steele Ln

Lance Drive Residential TIA
Near Term PM (95-120 Seconds)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	0	10	170	10	150	10	650	170	120	740	10
Future Volume (veh/h)	10	0	10	170	10	150	10	650	170	120	740	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.96	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	11	0	0	187	0	89	11	684	118	126	779	11
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	66	0	0	1827	0	911	23	738	1130	112	925	13
Arrive On Green	0.04	0.00	0.00	0.52	0.00	0.52	0.01	0.21	0.21	0.06	0.26	0.26
Sat Flow, veh/h	1767	0	0	3534	0	1568	1767	3526	1514	1767	3558	50
Grp Volume(v), veh/h	11	0	0	187	0	89	11	684	118	126	386	404
Grp Sat Flow(s),veh/h/ln	1767	0	0	1767	0	1568	1767	1763	1514	1767	1763	1845
Q Serve(g_s), s	0.7	0.0	0.0	3.0	0.0	0.0	0.7	20.9	2.5	7.0	22.8	22.8
Cycle Q Clear(g_c), s	0.7	0.0	0.0	3.0	0.0	0.0	0.7	20.9	2.5	7.0	22.8	22.8
Prop In Lane	1.00		0.00	1.00		1.00	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	66	0	0	1827	0	911	23	738	1130	112	458	480
V/C Ratio(X)	0.17	0.00	0.00	0.10	0.00	0.10	0.48	0.93	0.10	1.12	0.84	0.84
Avail Cap(c_a), veh/h	482	0	0	1827	0	911	80	740	1131	112	458	480
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.62	0.62	0.62	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.3	0.0	0.0	13.5	0.0	10.3	53.9	42.7	4.5	51.5	38.6	38.6
Incr Delay (d2), s/veh	1.2	0.0	0.0	0.1	0.0	0.2	9.3	12.3	0.0	120.9	13.3	12.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.0	1.2	0.0	1.0	0.4	10.2	2.7	6.8	11.3	11.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.5	0.0	0.0	13.7	0.0	10.5	63.2	54.9	4.5	172.4	51.8	51.3
LnGrp LOS	D	A	A	B	A	B	E	D	A	F	D	D
Approach Vol, veh/h		11			276			813			916	
Approach Delay, s/veh		52.5			12.6			47.7			68.2	
Approach LOS		D			B			D			E	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		61.5	6.3	33.5		8.7	11.9	27.9				
Change Period (Y+Rc), s		4.6	4.9	4.9		4.6	4.9	4.9				
Max Green Setting (Gmax), s		30.9	5.0	25.1		30.0	7.0	23.1				
Max Q Clear Time (g_c+I1), s		5.0	2.7	24.8		2.7	9.0	22.9				
Green Ext Time (p_c), s		0.9	0.0	0.1		0.0	0.0	0.1				
Intersection Summary												
HCM 6th Ctrl Delay				52.2								
HCM 6th LOS				D								
Notes												
User approved pedestrian interval to be less than phase max green.												
User approved volume balancing among the lanes for turning movement.												






















HCM 6th TWSC
2: Iroquois St/Apple Valley Ln & W Steele Ln

Lance Drive Residential TIA
Near Term PM (95-120 Seconds)

Intersection												
Int Delay, s/veh	3.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	30	300	40	40	460	40	40	10	20	30	10	30
Future Vol, veh/h	30	300	40	40	460	40	40	10	20	30	10	30
Conflicting Peds, #/hr	9	0	9	9	0	9	1	0	2	2	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	60	-	-	80	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	32	316	42	42	484	42	42	11	21	32	11	32
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	535	0	0	367	0	0	1022	1029	348	1017	1029	515
Stage 1	-	-	-	-	-	-	410	410	-	598	598	-
Stage 2	-	-	-	-	-	-	612	619	-	419	431	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1028	-	-	1186	-	-	213	233	693	215	233	558
Stage 1	-	-	-	-	-	-	617	594	-	487	489	-
Stage 2	-	-	-	-	-	-	479	479	-	610	581	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1019	-	-	1176	-	-	182	214	686	189	214	553
Mov Cap-2 Maneuver	-	-	-	-	-	-	182	214	-	189	214	-
Stage 1	-	-	-	-	-	-	592	570	-	468	467	-
Stage 2	-	-	-	-	-	-	425	457	-	561	558	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.7			0.6			26.9			23.3		
HCM LOS							D			C		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	237	1019	-	-	1176	-	-	270				
HCM Lane V/C Ratio	0.311	0.031	-	-	0.036	-	-	0.273				
HCM Control Delay (s)	26.9	8.6	-	-	8.2	-	-	23.3				
HCM Lane LOS	D	A	-	-	A	-	-	C				
HCM 95th %tile Q(veh)	1.3	0.1	-	-	0.1	-	-	1.1				

HCM 6th Signalized Intersection Summary 3: Range Ave & W Steele Ln

Lance Drive Residential TIA
Near Term PM (95-120 Seconds)











												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	320	80	60	440	50	90	200	40	60	420	50
Future Volume (veh/h)	40	320	80	60	440	50	90	200	40	60	420	50
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.96	1.00		0.93
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	42	333	78	62	458	50	94	208	24	62	438	41
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	528	938	220	599	1064	116	119	463	53	153	564	52
Arrive On Green	0.65	0.65	0.65	0.65	0.65	0.65	0.07	0.15	0.15	0.09	0.17	0.17
Sat Flow, veh/h	883	1448	339	965	1643	179	1767	3176	361	1767	3235	301
Grp Volume(v), veh/h	42	0	411	62	0	508	94	114	118	62	237	242
Grp Sat Flow(s),veh/h/ln	883	0	1787	965	0	1822	1767	1763	1774	1767	1763	1773
Q Serve(g_s), s	2.3	0.0	10.0	3.0	0.0	12.9	5.0	5.6	5.8	3.2	12.2	12.4
Cycle Q Clear(g_c), s	15.3	0.0	10.0	13.0	0.0	12.9	5.0	5.6	5.8	3.2	12.2	12.4
Prop In Lane	1.00		0.19	1.00		0.10	1.00		0.20	1.00		0.17
Lane Grp Cap(c), veh/h	528	0	1157	599	0	1180	119	257	258	153	308	309
V/C Ratio(X)	0.08	0.00	0.36	0.10	0.00	0.43	0.79	0.44	0.46	0.40	0.77	0.78
Avail Cap(c_a), veh/h	528	0	1157	599	0	1180	223	466	469	205	447	450
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.47	0.47	0.47	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.9	0.0	7.7	10.6	0.0	8.2	43.6	37.1	37.1	41.1	37.4	37.5
Incr Delay (d2), s/veh	0.3	0.0	0.9	0.3	0.0	1.1	2.1	0.2	0.2	0.6	2.6	3.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	3.6	0.7	0.0	4.7	2.2	2.4	2.4	1.4	5.3	5.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.2	0.0	8.5	11.0	0.0	9.3	45.7	37.3	37.4	41.7	40.1	40.5
LnGrp LOS	B	A	A	B	A	A	D	D	D	D	D	D
Approach Vol, veh/h		453			570			326			541	
Approach Delay, s/veh		8.9			9.5			39.7			40.4	
Approach LOS		A			A			D			D	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		65.1	9.4	20.5		65.1	12.1	17.7				
Change Period (Y+Rc), s		3.6	3.0	3.9		3.6	3.9	* 3.9				
Max Green Setting (Gmax), s		48.4	12.0	24.1		48.4	11.0	* 25				
Max Q Clear Time (g_c+I1), s		17.3	7.0	14.4		15.0	5.2	7.8				
Green Ext Time (p_c), s		0.9	0.0	0.7		1.2	0.0	0.4				
Intersection Summary												
HCM 6th Ctrl Delay			23.4									
HCM 6th LOS			C									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

HCM 6th Signalized Intersection Summary

4: Marlow Rd & Guerneville Rd

Lance Drive Residential TIA
Near Term PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	180	410	130	270	460	120	140	620	170	70	730	80
Future Volume (veh/h)	180	410	130	270	460	120	140	620	170	70	730	80
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	189	432	57	284	484	107	147	653	91	74	768	77
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	199	627	399	252	606	133	141	817	580	227	905	91
Arrive On Green	0.11	0.18	0.18	0.14	0.21	0.21	0.08	0.23	0.23	0.13	0.28	0.28
Sat Flow, veh/h	1767	3526	1536	1767	2860	628	1767	3526	1538	1767	3229	324
Grp Volume(v), veh/h	189	432	57	284	297	294	147	653	91	74	419	426
Grp Sat Flow(s),veh/h/ln	1767	1763	1536	1767	1763	1725	1767	1763	1538	1767	1763	1790
Q Serve(g_s), s	10.1	10.9	1.2	13.5	15.2	15.4	7.6	16.6	0.0	3.6	21.3	21.3
Cycle Q Clear(g_c), s	10.1	10.9	1.2	13.5	15.2	15.4	7.6	16.6	0.0	3.6	21.3	21.3
Prop In Lane	1.00		1.00	1.00		0.36	1.00		1.00	1.00		0.18
Lane Grp Cap(c), veh/h	199	627	399	252	373	365	141	817	580	227	494	502
V/C Ratio(X)	0.95	0.69	0.14	1.13	0.80	0.80	1.04	0.80	0.16	0.33	0.85	0.85
Avail Cap(c_a), veh/h	199	1006	564	252	466	456	141	1054	684	227	557	565
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.97	0.97	0.97	0.47	0.47	0.47	0.67	0.67	0.67
Uniform Delay (d), s/veh	41.9	36.6	7.6	40.7	35.5	35.6	43.7	34.4	19.8	37.6	32.3	32.3
Incr Delay (d2), s/veh	49.4	1.4	0.2	95.1	15.6	16.5	62.6	1.6	0.1	0.6	7.5	7.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.0	4.6	0.6	12.3	7.9	7.9	5.7	7.0	1.3	1.6	9.8	9.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	91.3	37.9	7.8	135.9	51.0	52.1	106.3	36.0	19.8	38.2	39.8	39.7
LnGrp LOS	F	D	A	F	D	D	F	D	B	D	D	D
Approach Vol, veh/h	678			875			891			919		
Approach Delay, s/veh	50.3			78.9			46.0			39.6		
Approach LOS	D			E			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	22.6	22.6	12.9	31.9	16.0	25.8	17.5	27.3				
Change Period (Y+Rc), s	5.7	* 5.7	5.3	5.3	5.3	5.7	5.3	5.3				
Max Green Setting (Gmax), s	27	* 27	7.6	30.0	10.7	25.1	9.2	28.4				
Max Q Clear Time (g_c+I1), s	12.9	12.9	9.6	23.3	12.1	17.4	5.6	18.6				
Green Ext Time (p_c), s	0.0	2.4	0.0	2.8	0.0	2.1	0.0	3.1				

Intersection Summary

HCM 6th Ctrl Delay 53.7

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary 5: Ridley Ave & Guerneville Rd

Lance Drive Residential TIA
Near Term PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	630	40	70	810	20	20	10	50	20	10	20
Future Volume (veh/h)	20	630	40	70	810	20	20	10	50	20	10	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	22	677	42	75	871	22	22	11	3	22	11	0
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	612	2926	181	683	3048	77	107	42	8	115	44	0
Arrive On Green	0.87	0.87	0.87	1.00	1.00	1.00	0.06	0.06	0.06	0.06	0.06	0.00
Sat Flow, veh/h	618	3371	209	727	3511	89	770	700	134	866	747	0
Grp Volume(v), veh/h	22	354	365	75	437	456	36	0	0	33	0	0
Grp Sat Flow(s),veh/h/ln	618	1763	1817	727	1763	1837	1603	0	0	1613	0	0
Q Serve(g_s), s	0.5	3.1	3.2	0.4	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.5	3.1	3.2	3.6	0.0	0.0	1.8	0.0	0.0	1.6	0.0	0.0
Prop In Lane	1.00		0.11	1.00		0.05	0.61		0.08	0.67		0.00
Lane Grp Cap(c), veh/h	612	1530	1577	683	1530	1595	156	0	0	159	0	0
V/C Ratio(X)	0.04	0.23	0.23	0.11	0.29	0.29	0.23	0.00	0.00	0.21	0.00	0.00
Avail Cap(c_a), veh/h	612	1530	1577	683	1530	1595	529	0	0	531	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.91	0.91	0.91	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.9	1.0	1.0	0.1	0.0	0.0	42.9	0.0	0.0	42.8	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.3	0.3	0.0	0.0	0.0	0.3	0.0	0.0	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.2	0.2	0.0	0.0	0.0	0.8	0.0	0.0	0.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	1.0	1.4	1.3	0.1	0.0	0.0	43.2	0.0	0.0	43.0	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	D	A	A	D	A	A
Approach Vol, veh/h	741			968			36			33		
Approach Delay, s/veh	1.3			0.0			43.2			43.0		
Approach LOS	A			A			D			D		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	86.4			8.6			86.4			8.6		
Change Period (Y+Rc), s	3.9			3.0			3.9			3.0		
Max Green Setting (Gmax), s	59.1			29.0			59.1			29.0		
Max Q Clear Time (g_c+I1), s	5.2			3.6			5.6			3.8		
Green Ext Time (p_c), s	1.4			0.1			2.0			0.1		

Intersection Summary

HCM 6th Ctrl Delay	2.3
HCM 6th LOS	A

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary 6: Lance Dr & Guerneville Rd

Lance Drive Residential TIA
Near Term PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	590	20	60	890	100	10	30	40	50	40	30
Future Volume (veh/h)	50	590	20	60	890	100	10	30	40	50	40	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	0.99		0.99	0.99		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	52	615	20	62	927	87	10	31	5	52	42	19
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	83	674	22	243	1001	436	67	152	21	121	79	29
Arrive On Green	0.09	0.39	0.39	0.18	0.38	0.38	0.11	0.11	0.11	0.11	0.11	0.11
Sat Flow, veh/h	1767	3482	113	1767	3526	1535	187	1384	192	603	723	268
Grp Volume(v), veh/h	52	311	324	62	927	87	46	0	0	113	0	0
Grp Sat Flow(s), veh/h/ln	1767	1763	1832	1767	1763	1535	1762	0	0	1594	0	0
Q Serve(g_s), s	2.7	15.9	15.9	2.9	23.9	3.6	0.0	0.0	0.0	4.1	0.0	0.0
Cycle Q Clear(g_c), s	2.7	15.9	15.9	2.9	23.9	3.6	2.2	0.0	0.0	6.3	0.0	0.0
Prop In Lane	1.00		0.06	1.00		1.00	0.22		0.11	0.46		0.17
Lane Grp Cap(c), veh/h	83	341	355	243	1001	436	239	0	0	230	0	0
V/C Ratio(X)	0.62	0.91	0.91	0.26	0.93	0.20	0.19	0.00	0.00	0.49	0.00	0.00
Avail Cap(c_a), veh/h	162	737	766	243	1473	641	609	0	0	570	0	0
HCM Platoon Ratio	2.00	2.00	2.00	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.90	0.90	0.90	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	42.2	28.3	28.3	34.7	28.6	22.3	38.6	0.0	0.0	40.4	0.0	0.0
Incr Delay (d2), s/veh	2.8	3.9	3.9	0.2	14.2	0.9	0.1	0.0	0.0	0.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	5.3	5.5	1.2	10.5	1.3	1.0	0.0	0.0	2.6	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.0	32.3	32.2	34.8	42.8	23.2	38.8	0.0	0.0	41.0	0.0	0.0
LnGrp LOS	D	C	C	C	D	C	D	A	A	D	A	A
Approach Vol, veh/h	687			1076			46			113		
Approach Delay, s/veh	33.2			40.8			38.8			41.0		
Approach LOS	C			D			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.4	23.7		15.0	9.8	32.3		15.0				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		4.6				
Max Green Setting (Gmax), s	39.7	39.7		31.4	8.7	39.7		31.4				
Max Q Clear Time (g_c+14), s	17.9	17.9		8.3	4.7	25.9		4.2				
Green Ext Time (p_c), s	0.0	0.5		0.1	0.0	1.1		0.0				

Intersection Summary

HCM 6th Ctrl Delay	38.0
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

7: N Dutton Ave/Westberry Dr & Guerneville Rd

Lance Drive Residential TIA

Near Term PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	620	100	460	850	20	160	10	450	10	10	10
Future Volume (veh/h)	10	620	100	460	850	20	160	10	450	10	10	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	11	667	100	495	914	21	180	0	133	11	11	7
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	28	735	110	1503	2332	54	212	0	783	30	30	19
Arrive On Green	0.02	0.24	0.24	0.44	0.66	0.66	0.06	0.00	0.06	0.05	0.05	0.05
Sat Flow, veh/h	1767	3064	459	3428	3520	81	3534	0	1557	658	658	419
Grp Volume(v), veh/h	11	383	384	495	458	477	180	0	133	29	0	0
Grp Sat Flow(s), veh/h/ln	1767	1763	1760	1714	1763	1838	1767	0	1557	1736	0	0
Q Serve(g_s), s	0.6	20.1	20.1	9.0	11.2	11.2	4.8	0.0	0.0	1.5	0.0	0.0
Cycle Q Clear(g_c), s	0.6	20.1	20.1	9.0	11.2	11.2	4.8	0.0	0.0	1.5	0.0	0.0
Prop In Lane	1.00		0.26	1.00		0.04	1.00		1.00	0.38		0.24
Lane Grp Cap(c), veh/h	28	423	422	1503	1168	1218	212	0	783	80	0	0
V/C Ratio(X)	0.39	0.91	0.91	0.33	0.39	0.39	0.85	0.00	0.17	0.36	0.00	0.00
Avail Cap(c_a), veh/h	112	471	471	1503	1168	1218	212	0	783	506	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.97	0.97	0.97	0.70	0.70	0.70	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	46.3	35.1	35.1	17.5	7.3	7.3	44.2	0.0	13.0	44.0	0.0	0.0
Incr Delay (d2), s/veh	3.2	25.1	25.5	0.0	0.7	0.7	25.1	0.0	0.0	1.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	11.1	11.2	3.3	3.7	3.8	2.8	0.0	1.4	0.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.4	60.2	60.6	17.5	8.0	8.0	69.3	0.0	13.1	45.0	0.0	0.0
LnGrp LOS	D	E	E	B	A	A	E	A	B	D	A	A
Approach Vol, veh/h	778			1430			313			29		
Approach Delay, s/veh	60.2			11.3			45.4			45.0		
Approach LOS	E			B			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	47.0	28.1		9.0	6.8	68.2		11.0				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		5.3				
Max Green Setting (Gmax), s	45.3	25.4		27.7	6.0	35.1		5.7				
Max Q Clear Time (g_c+I1), s	11.0	22.1		3.5	2.6	13.2		6.8				
Green Ext Time (p_c), s	0.1	0.4		0.0	0.0	0.8		0.0				

Intersection Summary

HCM 6th Ctrl Delay 30.8

HCM 6th LOS C

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

8: Herbert St/Coffey Ln & Guerneville Rd

Lance Drive Residential TIA
Near Term PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	180	840	60	50	1080	90	40	20	30	100	30	230
Future Volume (veh/h)	180	840	60	50	1080	90	40	20	30	100	30	230
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.99	1.00		0.93	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	196	913	61	54	1174	94	43	22	16	109	33	51
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	149	968	65	573	1748	140	83	42	31	166	50	312
Arrive On Green	0.08	0.29	0.29	0.32	0.53	0.53	0.09	0.09	0.09	0.12	0.12	0.12
Sat Flow, veh/h	1767	3343	223	1767	3304	264	913	467	340	1372	415	1487
Grp Volume(v), veh/h	196	481	493	54	626	642	81	0	0	142	0	51
Grp Sat Flow(s), veh/h/ln	1767	1763	1804	1767	1763	1805	1719	0	0	1787	0	1487
Q Serve(g_s), s	9.7	30.7	30.7	2.5	29.8	29.9	5.2	0.0	0.0	8.7	0.0	3.2
Cycle Q Clear(g_c), s	9.7	30.7	30.7	2.5	29.8	29.9	5.2	0.0	0.0	8.7	0.0	3.2
Prop In Lane	1.00		0.12	1.00		0.15	0.53		0.20	0.77		1.00
Lane Grp Cap(c), veh/h	149	510	522	573	933	955	156	0	0	216	0	312
V/C Ratio(X)	1.31	0.94	0.94	0.09	0.67	0.67	0.52	0.00	0.00	0.66	0.00	0.16
Avail Cap(c_a), veh/h	149	581	595	573	933	955	374	0	0	404	0	469
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.84	0.84	0.84	0.83	0.83	0.83	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	52.7	39.9	39.9	27.1	19.8	19.8	49.9	0.0	0.0	48.3	0.0	37.6
Incr Delay (d2), s/veh	175.8	24.9	24.5	0.0	3.2	3.1	1.0	0.0	0.0	1.3	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	16.3	16.7	1.0	12.2	12.5	2.3	0.0	0.0	3.9	0.0	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	228.5	64.8	64.4	27.1	23.0	22.9	50.9	0.0	0.0	49.5	0.0	37.7
LnGrp LOS	F	E	E	C	C	C	D	A	A	D	A	D
Approach Vol, veh/h	1170			1322			81			193		
Approach Delay, s/veh	92.1			23.1			50.9			46.4		
Approach LOS	F			C			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	42.6	38.6		18.8	15.0	66.2		15.0				
Change Period (Y+Rc), s	5.3	5.3		4.9	5.3	5.3		4.6				
Max Green Setting (Gmax), s	60.0	37.9		26.0	9.7	34.2		25.0				
Max Q Clear Time (g_c+14.5), s	14.5	32.7		10.7	11.7	31.9		7.2				
Green Ext Time (p_c), s	0.0	0.6		0.1	0.0	0.5		0.1				

Intersection Summary

HCM 6th Ctrl Delay	54.7
HCM 6th LOS	D

HCM 6th Signalized Intersection Summary

9: Range Ave & Guerneville Rd

Lance Drive Residential TIA
Near Term PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	150	600	200	90	730	20	270	160	140	100	220	240
Future Volume (veh/h)	150	600	200	90	730	20	270	160	140	100	220	240
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.93
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	156	625	0	94	760	0	173	318	71	104	229	89
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	517	1692		112	883		292	485	106	134	186	69
Arrive On Green	0.29	0.48	0.00	0.06	0.25	0.00	0.17	0.17	0.17	0.03	0.03	0.03
Sat Flow, veh/h	1767	3618	0	1767	3618	0	1767	2932	644	1767	2457	914
Grp Volume(v), veh/h	156	625	0	94	760	0	173	199	190	104	161	157
Grp Sat Flow(s),veh/h/ln	1767	1763	0	1767	1763	0	1767	1856	1720	1767	1763	1608
Q Serve(g_s), s	6.5	10.6	0.0	5.0	19.6	0.0	8.6	9.5	9.8	5.6	7.2	7.2
Cycle Q Clear(g_c), s	6.5	10.6	0.0	5.0	19.6	0.0	8.6	9.5	9.8	5.6	7.2	7.2
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.37	1.00		0.57
Lane Grp Cap(c), veh/h	517	1692		112	883		292	307	284	134	134	122
V/C Ratio(X)	0.30	0.37		0.84	0.86		0.59	0.65	0.67	0.78	1.21	1.29
Avail Cap(c_a), veh/h	517	1692		112	1058		610	641	594	134	134	122
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	0.80	0.80	0.00	0.94	0.94	0.00	1.00	1.00	1.00	0.62	0.62	0.62
Uniform Delay (d), s/veh	26.1	15.6	0.0	44.0	34.0	0.0	36.7	37.1	37.2	45.5	46.3	46.3
Incr Delay (d2), s/veh	0.1	0.5	0.0	37.6	5.3	0.0	0.7	0.9	1.0	14.9	128.7	161.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	4.1	0.0	3.3	8.7	0.0	3.7	4.3	4.2	3.0	8.0	8.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.2	16.1	0.0	81.6	39.3	0.0	37.4	37.9	38.2	60.4	175.0	207.6
LnGrp LOS	C	B		F	D		D	D	D	E	F	F
Approach Vol, veh/h	781		A	854		A	562			422		
Approach Delay, s/veh	18.1			43.9			37.9			158.9		
Approach LOS	B			D			D			F		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	1.3	50.9		12.5	33.1	29.1		20.3				
Change Period (Y+Rc), s	5.3	5.3		5.3	5.3	5.3		4.6				
Max Green Setting (Gmax), s	6.0	28.5		7.2	6.0	28.5		32.8				
Max Q Clear Time (g_c+11), s	12.6			9.2	8.5	21.6		11.8				
Green Ext Time (p_c), s	0.0	0.7		0.0	0.0	0.8		0.3				

Intersection Summary

HCM 6th Ctrl Delay 53.5

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

10: Guerneville Rd & Steele Wy

Lance Drive Residential TIA
Near Term PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	710	100	130	750	10	70	40	160	320	50	20
Future Volume (veh/h)	20	710	100	130	750	10	70	40	160	320	50	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	20	724	75	133	765	10	56	62	71	363	0	4
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	667	1930	978	218	831	11	145	153	226	464	0	794
Arrive On Green	0.38	0.55	0.55	0.06	0.23	0.23	0.08	0.08	0.08	0.13	0.00	0.13
Sat Flow, veh/h	1767	3526	1550	3428	3563	47	1767	1856	1532	3534	0	1526
Grp Volume(v), veh/h	20	724	75	133	378	397	56	62	71	363	0	4
Grp Sat Flow(s), veh/h/ln	1767	1763	1550	1714	1763	1847	1767	1856	1532	1767	0	1526
Q Serve(g_s), s	0.8	12.9	2.1	4.2	23.1	23.1	3.3	3.5	4.6	10.9	0.0	0.0
Cycle Q Clear(g_c), s	0.8	12.9	2.1	4.2	23.1	23.1	3.3	3.5	4.6	10.9	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.03	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	667	1930	978	218	411	431	145	153	226	464	0	794
V/C Ratio(X)	0.03	0.38	0.08	0.61	0.92	0.92	0.39	0.41	0.31	0.78	0.00	0.01
Avail Cap(c_a), veh/h	667	1930	978	221	476	499	434	455	476	868	0	969
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.83	0.83	0.83	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	21.5	14.2	7.9	50.2	41.2	41.2	47.8	47.9	42.1	46.3	0.0	13.3
Incr Delay (d2), s/veh	0.0	0.5	0.1	3.4	20.1	19.5	0.6	0.6	0.3	1.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	5.0	0.9	1.9	12.1	12.6	1.5	1.6	1.7	4.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.6	14.6	8.1	53.5	61.3	60.6	48.5	48.6	42.4	47.4	0.0	13.3
LnGrp LOS	C	B	A	D	E	E	D	D	D	D	A	B
Approach Vol, veh/h	819			908			189			367		
Approach Delay, s/veh	14.2			59.9			46.2			47.0		
Approach LOS	B			E			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	1.9	65.1		19.3	46.4	30.6		13.6				
Change Period (Y+Rc), s	4.9	4.9		4.9	4.9	4.9		4.6				
Max Green Setting (Gmax), s	29.6			27.0	7.0	29.7		27.0				
Max Q Clear Time (g_c+10), s	14.9			12.9	2.8	25.1		6.6				
Green Ext Time (p_c), s	0.0	0.9		0.1	0.0	0.5		0.1				

Intersection Summary

HCM 6th Ctrl Delay 40.3

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

11: Cleveland Ave & Guerneville Rd

Lance Drive Residential TIA
Near Term PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↑↑↔		↔↔	↑↑	↔	↔	↑↔		↔	↔↔	
Traffic Volume (veh/h)	110	1020	80	310	1190	200	90	130	230	410	340	120
Future Volume (veh/h)	110	1020	80	310	1190	200	90	130	230	410	340	120
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.98	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	115	1062	75	323	1240	142	94	135	46	296	538	106
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	240	1465	103	393	1228	536	288	423	138	375	635	125
Arrive On Green	0.07	0.30	0.30	0.04	0.11	0.11	0.16	0.16	0.16	0.21	0.21	0.21
Sat Flow, veh/h	3428	4821	340	3428	3526	1538	1767	2596	847	1767	2997	588
Grp Volume(v), veh/h	115	744	393	323	1240	142	94	90	91	296	332	312
Grp Sat Flow(s),veh/h/ln	1714	1689	1784	1714	1763	1538	1767	1763	1681	1767	1856	1729
Q Serve(g_s), s	3.1	18.7	18.7	8.9	33.1	8.0	4.5	4.3	4.6	15.1	16.3	16.5
Cycle Q Clear(g_c), s	3.1	18.7	18.7	8.9	33.1	8.0	4.5	4.3	4.6	15.1	16.3	16.5
Prop In Lane	1.00		0.19	1.00		1.00	1.00		0.50	1.00		0.34
Lane Grp Cap(c), veh/h	240	1026	542	393	1228	536	288	288	274	375	393	366
V/C Ratio(X)	0.48	0.72	0.73	0.82	1.01	0.26	0.33	0.31	0.33	0.79	0.84	0.85
Avail Cap(c_a), veh/h	253	1026	542	422	1228	536	288	288	274	502	527	491
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.50	0.50	0.50	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.5	29.5	29.5	44.7	42.0	30.9	35.1	35.1	35.2	35.4	35.9	36.0
Incr Delay (d2), s/veh	0.5	2.2	4.2	5.6	20.5	0.0	3.0	2.8	3.2	4.2	7.2	8.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	7.6	8.3	4.3	19.0	3.1	2.1	2.0	2.1	6.7	7.9	7.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.0	31.8	33.7	50.3	62.5	31.0	38.1	37.9	38.4	39.7	43.1	44.2
LnGrp LOS	D	C	C	D	F	C	D	D	D	D	D	D
Approach Vol, veh/h	1252			1705			275			940		
Approach Delay, s/veh	33.4			57.6			38.1			42.4		
Approach LOS	C			E			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.8	33.8		20.4	11.6	38.0		25.0				
Change Period (Y+Rc), s	4.9	4.9		4.9	4.9	4.9		4.9				
Max Green Setting (Gmax), s	1.3	28.4		8.3	7.0	33.1		27.0				
Max Q Clear Time (g_c+I10), s	10.9	20.7		6.6	5.1	35.1		18.5				
Green Ext Time (p_c), s	0.0	1.2		0.0	0.0	0.0		0.5				

Intersection Summary

HCM 6th Ctrl Delay 45.6

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 12: US 101 SB Ramps & Guerneville Rd

Lance Drive Residential TIA
Near Term PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑					↑	↑	↑
Traffic Volume (veh/h)	0	1130	550	300	1370	0	0	0	0	290	70	330
Future Volume (veh/h)	0	1130	550	300	1370	0	0	0	0	290	70	330
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1856	1856	1856	1856	0				1856	1856	1856
Adj Flow Rate, veh/h	0	1165	176	309	1412	0				186	231	306
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	1345	402	375	1504	0				836	878	744
Arrive On Green	0.00	0.27	0.27	0.11	0.43	0.00				0.47	0.47	0.47
Sat Flow, veh/h	0	5233	1512	3428	3618	0				1767	1856	1572
Grp Volume(v), veh/h	0	1165	176	309	1412	0				186	231	306
Grp Sat Flow(s),veh/h/ln	0	1689	1512	1714	1763	0				1767	1856	1572
Q Serve(g_s), s	0.0	20.8	9.2	8.4	36.4	0.0				5.9	7.1	12.1
Cycle Q Clear(g_c), s	0.0	20.8	9.2	8.4	36.4	0.0				5.9	7.1	12.1
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1345	402	375	1504	0				836	878	744
V/C Ratio(X)	0.00	0.87	0.44	0.82	0.94	0.00				0.22	0.26	0.41
Avail Cap(c_a), veh/h	0	1925	575	516	2052	0				836	878	744
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.55	0.55	0.72	0.72	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	33.3	29.0	41.4	26.0	0.0				14.7	15.1	16.4
Incr Delay (d2), s/veh	0.0	1.3	0.2	4.0	4.8	0.0				0.6	0.7	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	8.4	3.3	3.7	15.2	0.0				2.3	2.9	4.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	34.5	29.1	45.4	30.8	0.0				15.3	15.8	18.0
LnGrp LOS	A	C	C	D	C	A				B	B	B
Approach Vol, veh/h		1341			1721						723	
Approach Delay, s/veh		33.8			33.4						16.6	
Approach LOS		C			C						B	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	5.3	30.1		49.6		45.4						
Change Period (Y+Rc), s	4.9	4.9		4.6		4.9						
Max Green Setting (Gmax), s	4.3	36.1		30.2		55.3						
Max Q Clear Time (g_c+I1), s	4.4	22.8		14.1		38.4						
Green Ext Time (p_c), s	0.0	1.6		0.2		2.2						

Intersection Summary

HCM 6th Ctrl Delay	30.4
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 13: US 101 NB Ramps & Guerneville Rd/Steele Ln

Lance Drive Residential TIA
Near Term PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↑↑			↑↑↑		↰	↰↱	↰			
Traffic Volume (veh/h)	400	1030	0	0	1000	240	670	10	330	0	0	0
Future Volume (veh/h)	400	1030	0	0	1000	240	670	10	330	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1856	1856	0	0	1856	1856	1856	1856	1856			
Adj Flow Rate, veh/h	417	1073	0	0	1042	223	788	0	188			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	3	3	0	0	3	3	3	3	3			
Cap, veh/h	1133	2326	0	0	1155	247	849	0	378			
Arrive On Green	0.66	1.00	0.00	0.00	0.28	0.28	0.24	0.00	0.24			
Sat Flow, veh/h	3428	3618	0	0	4326	889	3534	0	1572			
Grp Volume(v), veh/h	417	1073	0	0	846	419	788	0	188			
Grp Sat Flow(s),veh/h/ln	1714	1763	0	0	1689	1671	1767	0	1572			
Q Serve(g_s), s	5.2	0.0	0.0	0.0	22.9	23.0	20.7	0.0	9.8			
Cycle Q Clear(g_c), s	5.2	0.0	0.0	0.0	22.9	23.0	20.7	0.0	9.8			
Prop In Lane	1.00		0.00	0.00		0.53	1.00		1.00			
Lane Grp Cap(c), veh/h	1133	2326	0	0	938	464	849	0	378			
V/C Ratio(X)	0.37	0.46	0.00	0.00	0.90	0.90	0.93	0.00	0.50			
Avail Cap(c_a), veh/h	1133	2326	0	0	1177	582	1168	0	520			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.62	0.62	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	11.7	0.0	0.0	0.0	33.1	33.1	35.3	0.0	31.1			
Incr Delay (d2), s/veh	0.0	0.4	0.0	0.0	7.3	13.4	8.7	0.0	0.4			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	1.6	0.1	0.0	0.0	10.0	10.7	9.4	0.0	3.6			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.7	0.4	0.0	0.0	40.3	46.5	43.9	0.0	31.5			
LnGrp LOS	B	A	A	A	D	D	D	A	C			
Approach Vol, veh/h	1490			1265			976					
Approach Delay, s/veh	3.6			42.4			41.5					
Approach LOS	A			D			D					
Timer - Assigned Phs	2			5			6			8		
Phs Duration (G+Y+Rc), s	67.6			36.3			31.3			27.4		
Change Period (Y+Rc), s	4.9			4.9			4.9			4.6		
Max Green Setting (Gmax), s	54.1			16.1			33.1			31.4		
Max Q Clear Time (g_c+I1), s	2.0			7.2			25.0			22.7		
Green Ext Time (p_c), s	1.5			0.1			1.4			0.1		

Intersection Summary

HCM 6th Ctrl Delay	26.7
HCM 6th LOS	C

Notes










User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

14: Stony Point Rd/Marlow Rd & W College Ave

Lance Drive Residential TIA
Near Term PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	260	110	220	370	210	160	750	260	170	820	120
Future Volume (veh/h)	80	260	110	220	370	210	160	750	260	170	820	120
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	84	274	76	232	389	155	168	789	151	179	863	115
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	350	391	106	472	522	205	173	887	809	203	837	112
Arrive On Green	0.20	0.14	0.14	0.27	0.21	0.21	0.10	0.25	0.25	0.11	0.27	0.27
Sat Flow, veh/h	1767	2728	740	1767	2460	966	1767	3526	1544	1767	3119	416
Grp Volume(v), veh/h	84	175	175	232	277	267	168	789	151	179	488	490
Grp Sat Flow(s),veh/h/ln	1767	1763	1705	1767	1763	1663	1767	1763	1544	1767	1763	1772
Q Serve(g_s), s	3.8	9.0	9.3	10.5	14.0	14.3	9.0	20.5	2.1	9.5	25.5	25.5
Cycle Q Clear(g_c), s	3.8	9.0	9.3	10.5	14.0	14.3	9.0	20.5	2.1	9.5	25.5	25.5
Prop In Lane	1.00		0.43	1.00		0.58	1.00		1.00	1.00		0.23
Lane Grp Cap(c), veh/h	350	252	244	472	374	353	173	887	809	203	473	476
V/C Ratio(X)	0.24	0.69	0.72	0.49	0.74	0.76	0.97	0.89	0.19	0.88	1.03	1.03
Avail Cap(c_a), veh/h	350	482	467	472	542	511	173	931	828	203	473	476
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.36	0.36	0.36	1.00	1.00	1.00	0.48	0.48	0.48
Uniform Delay (d), s/veh	32.1	38.7	38.9	29.4	35.0	35.1	42.7	34.3	3.6	41.4	34.7	34.8
Incr Delay (d2), s/veh	0.3	3.4	3.9	0.3	1.1	1.4	59.7	10.3	0.1	19.3	36.8	36.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	4.0	4.0	4.3	5.9	5.7	6.7	9.6	0.8	5.1	15.2	15.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.4	42.1	42.8	29.6	36.1	36.5	102.4	44.6	3.7	60.7	71.6	71.5
LnGrp LOS	C	D	D	C	D	D	F	D	A	E	F	F
Approach Vol, veh/h	434				776		1108				1157	
Approach Delay, s/veh	40.5				34.3		47.8				69.9	
Approach LOS	D				C		D				E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	30.7	18.9	14.6	30.8	24.1	25.5	16.2	29.2				
Change Period (Y+Rc), s	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3				
Max Green Setting (Gmax), s	30.0	26.0	9.3	25.5	9.8	29.2	9.7	25.1				
Max Q Clear Time (g_c+I1), s	11.3	11.3	11.0	27.5	5.8	16.3	11.5	22.5				
Green Ext Time (p_c), s	0.0	1.6	0.0	0.0	0.1	2.6	0.0	1.4				

Intersection Summary

HCM 6th Ctrl Delay 51.2

HCM 6th LOS D

Notes









User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

15: N Dutton Ave & W College Ave

Lance Drive Residential TIA
Near Term PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	600	110	180	810	170	160	330	130	300	490	150
Future Volume (veh/h)	90	600	110	180	810	170	160	330	130	300	490	150
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	94	625	103	188	844	162	167	344	100	312	510	130
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	119	688	113	241	900	173	446	434	124	566	636	161
Arrive On Green	0.07	0.23	0.23	0.14	0.31	0.31	0.25	0.16	0.16	0.32	0.23	0.23
Sat Flow, veh/h	1767	3022	497	1767	2942	565	1767	2691	769	1767	2772	703
Grp Volume(v), veh/h	94	364	364	188	506	500	167	223	221	312	323	317
Grp Sat Flow(s),veh/h/ln	1767	1763	1756	1767	1763	1743	1767	1763	1698	1767	1763	1712
Q Serve(g_s), s	5.0	19.1	19.2	9.8	26.5	26.5	7.4	11.6	11.9	13.8	16.4	16.6
Cycle Q Clear(g_c), s	5.0	19.1	19.2	9.8	26.5	26.5	7.4	11.6	11.9	13.8	16.4	16.6
Prop In Lane	1.00		0.28	1.00		0.32	1.00		0.45	1.00		0.41
Lane Grp Cap(c), veh/h	119	401	400	241	539	533	446	284	274	566	404	392
V/C Ratio(X)	0.79	0.91	0.91	0.78	0.94	0.94	0.37	0.79	0.81	0.55	0.80	0.81
Avail Cap(c_a), veh/h	130	429	427	260	559	552	446	408	393	566	501	487
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.79	0.79	0.79	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.6	35.7	35.8	39.7	32.1	32.1	29.3	38.3	38.4	26.6	34.6	34.6
Incr Delay (d2), s/veh	18.4	17.7	18.2	11.6	22.9	23.1	0.2	3.7	5.0	0.7	5.8	6.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	9.9	9.9	4.9	14.2	14.1	3.1	5.2	5.2	5.6	7.4	7.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	62.1	53.4	54.0	51.3	55.0	55.1	29.5	42.0	43.4	27.3	40.4	41.0
LnGrp LOS	E	D	D	D	D	E	C	D	D	C	D	D
Approach Vol, veh/h	822				1194		611				952	
Approach Delay, s/veh	54.6				54.5		39.1				36.3	
Approach LOS	D				D		D				D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.8	25.5	27.0	25.7	9.4	33.0	33.4	19.2				
Change Period (Y+Rc), s	3.9	* 3.9	3.0	3.9	3.0	3.9	3.0	3.9				
Max Green Setting (Gmax), s	4.0	* 23	17.1	27.0	7.0	30.1	22.1	22.0				
Max Q Clear Time (g_c+I1), s	11.8	21.2	9.4	18.6	7.0	28.5	15.8	13.9				
Green Ext Time (p_c), s	0.0	0.4	0.0	0.9	0.0	0.5	0.1	0.6				

Intersection Summary

HCM 6th Ctrl Delay 47.1

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection

Intersection Delay, s/veh 7.3

Intersection LOS A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	0	0	0	80	0	0	0	70	0	0
Future Vol, veh/h	0	0	0	0	0	80	0	0	0	70	0	0
Peak Hour Factor	0.86	0.86	0.92	0.92	0.86	0.86	0.92	0.92	0.92	0.86	0.92	0.86
Heavy Vehicles, %	3	3	2	2	3	3	2	2	2	3	2	3
Mvmt Flow	0	0	0	0	0	93	0	0	0	81	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0























Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	0	6.9	0	7.8
HCM LOS	-	A	-	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	0%	0%	100%
Vol Thru, %	100%	100%	0%	0%
Vol Right, %	0%	0%	100%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	0	0	80	70
LT Vol	0	0	0	70
Through Vol	0	0	0	0
RT Vol	0	0	80	0
Lane Flow Rate	0	0	93	81
Geometry Grp	1	1	1	1
Degree of Util (X)	0	0	0.09	0.098
Departure Headway (Hd)	4.16	4.165	3.492	4.315
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	0	0	1018	833
Service Time	2.197	2.223	1.543	2.328
HCM Lane V/C Ratio	0	0	0.091	0.097
HCM Control Delay	7.2	7.2	6.9	7.8
HCM Lane LOS	N	N	A	A
HCM 95th-tile Q	0	0	0.3	0.3

HCM 6th Signalized Intersection Summary







1: Marlow Rd & Marlow Ct/W Steele Ln

Lance Drive Residential TIA
Near Term PM (120 Seconds)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	0	10	170	10	150	10	650	170	120	740	10
Future Volume (veh/h)	10	0	10	170	10	150	10	650	170	120	740	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.96	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	11	0	0	187	0	89	11	684	118	126	779	10
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	48	0	0	1748	0	913	23	819	1130	155	1096	14
Arrive On Green	0.03	0.00	0.00	0.49	0.00	0.49	0.01	0.23	0.23	0.09	0.31	0.31
Sat Flow, veh/h	1767	0	0	3534	0	1568	1767	3526	1517	1767	3563	46
Grp Volume(v), veh/h	11	0	0	187	0	89	11	684	118	126	385	404
Grp Sat Flow(s),veh/h/ln	1767	0	0	1767	0	1568	1767	1763	1517	1767	1763	1846
Q Serve(g_s), s	0.7	0.0	0.0	3.4	0.0	0.0	0.7	22.2	2.8	8.4	23.2	23.3
Cycle Q Clear(g_c), s	0.7	0.0	0.0	3.4	0.0	0.0	0.7	22.2	2.8	8.4	23.2	23.3
Prop In Lane	1.00		0.00	1.00		1.00	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	48	0	0	1748	0	913	23	819	1130	155	542	568
V/C Ratio(X)	0.23	0.00	0.00	0.11	0.00	0.10	0.49	0.84	0.10	0.81	0.71	0.71
Avail Cap(c_a), veh/h	227	0	0	1748	0	913	149	1031	1221	517	883	925
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.66	0.66	0.66	1.00	1.00	1.00
Uniform Delay (d), s/veh	57.2	0.0	0.0	16.2	0.0	11.1	58.8	43.9	4.9	53.7	36.8	36.8
Incr Delay (d2), s/veh	2.4	0.0	0.0	0.1	0.0	0.2	10.3	3.3	0.0	9.6	1.7	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	1.4	0.0	1.1	0.4	9.9	2.9	4.1	10.1	10.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.6	0.0	0.0	16.3	0.0	11.3	69.1	47.2	4.9	63.4	38.6	38.5
LnGrp LOS	E	A	A	B	A	B	E	D	A	E	D	D
Approach Vol, veh/h		11			276			813			915	
Approach Delay, s/veh		59.6			14.7			41.3			41.9	
Approach LOS		E			B			D			D	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		63.9	6.4	41.8		7.8	15.5	32.8				
Change Period (Y+Rc), s		4.6	4.9	4.9		4.6	4.9	4.9				
Max Green Setting (Gmax), s		15.4	10.1	60.1		15.4	35.1	35.1				
Max Q Clear Time (g_c+I1), s		5.4	2.7	25.3		2.7	10.4	24.2				
Green Ext Time (p_c), s		0.7	0.0	5.4		0.0	0.3	3.7				
Intersection Summary												
HCM 6th Ctrl Delay			38.1									
HCM 6th LOS			D									
Notes												
User approved pedestrian interval to be less than phase max green.												
User approved volume balancing among the lanes for turning movement.												






















HCM 6th TWSC
2: Iroquois St/Apple Valley Ln & W Steele Ln

Lance Drive Residential TIA
Near Term PM (120 Seconds)

Intersection												
Int Delay, s/veh	3.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	30	300	40	40	460	40	40	10	20	30	10	30
Future Vol, veh/h	30	300	40	40	460	40	40	10	20	30	10	30
Conflicting Peds, #/hr	9	0	9	9	0	9	1	0	2	2	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	60	-	-	80	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	32	316	42	42	484	42	42	11	21	32	11	32
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	535	0	0	367	0	0	1022	1029	348	1017	1029	515
Stage 1	-	-	-	-	-	-	410	410	-	598	598	-
Stage 2	-	-	-	-	-	-	612	619	-	419	431	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1028	-	-	1186	-	-	213	233	693	215	233	558
Stage 1	-	-	-	-	-	-	617	594	-	487	489	-
Stage 2	-	-	-	-	-	-	479	479	-	610	581	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1019	-	-	1176	-	-	182	214	686	189	214	553
Mov Cap-2 Maneuver	-	-	-	-	-	-	182	214	-	189	214	-
Stage 1	-	-	-	-	-	-	592	570	-	468	467	-
Stage 2	-	-	-	-	-	-	425	457	-	561	558	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.7			0.6			26.9			23.3		
HCM LOS							D			C		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	237	1019	-	-	1176	-	-	270				
HCM Lane V/C Ratio	0.311	0.031	-	-	0.036	-	-	0.273				
HCM Control Delay (s)	26.9	8.6	-	-	8.2	-	-	23.3				
HCM Lane LOS	D	A	-	-	A	-	-	C				
HCM 95th %tile Q(veh)	1.3	0.1	-	-	0.1	-	-	1.1				

HCM 6th Signalized Intersection Summary 3: Range Ave & W Steele Ln

Lance Drive Residential TIA
Near Term PM (120 Seconds)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	320	80	60	440	50	90	200	40	60	420	50
Future Volume (veh/h)	40	320	80	60	440	50	90	200	40	60	420	50
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.96	1.00		0.92
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	42	333	78	62	458	50	94	208	24	62	438	40
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	563	998	234	636	1132	124	117	419	48	148	509	46
Arrive On Green	0.69	0.69	0.69	0.69	0.69	0.69	0.07	0.13	0.13	0.08	0.16	0.16
Sat Flow, veh/h	884	1448	339	966	1643	179	1767	3174	361	1767	3241	294
Grp Volume(v), veh/h	42	0	411	62	0	508	94	114	118	62	237	241
Grp Sat Flow(s),veh/h/ln	884	0	1787	966	0	1822	1767	1763	1772	1767	1763	1772
Q Serve(g_s), s	2.6	0.0	11.1	3.3	0.0	14.4	6.3	7.2	7.4	4.0	15.7	15.9
Cycle Q Clear(g_c), s	17.0	0.0	11.1	14.5	0.0	14.4	6.3	7.2	7.4	4.0	15.7	15.9
Prop In Lane	1.00		0.19	1.00		0.10	1.00		0.20	1.00		0.17
Lane Grp Cap(c), veh/h	563	0	1232	636	0	1256	117	233	234	148	277	278
V/C Ratio(X)	0.07	0.00	0.33	0.10	0.00	0.40	0.80	0.49	0.50	0.42	0.86	0.87
Avail Cap(c_a), veh/h	563	0	1232	636	0	1256	236	560	563	162	486	489
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.58	0.58	0.58	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.7	0.0	7.5	10.4	0.0	8.0	55.3	48.3	48.4	52.2	49.3	49.3
Incr Delay (d2), s/veh	0.3	0.0	0.7	0.3	0.0	1.0	2.8	0.3	0.4	0.7	3.0	3.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	4.1	0.7	0.0	5.4	2.9	3.1	3.3	1.8	7.0	7.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.0	0.0	8.3	10.7	0.0	9.0	58.1	48.7	48.8	52.9	52.2	52.5
LnGrp LOS	B	A	A	B	A	A	E	D	D	D	D	D
Approach Vol, veh/h		453			570			326			540	
Approach Delay, s/veh		8.6			9.2			51.4			52.4	
Approach LOS		A			A			D			D	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		86.3	11.0	22.7		86.3	13.9	19.7				
Change Period (Y+Rc), s		3.6	3.0	3.9		3.6	3.9	* 3.9				
Max Green Setting (Gmax), s		60.4	16.0	33.1		60.4	11.0	* 38				
Max Q Clear Time (g_c+I1), s		19.0	8.3	17.9		16.5	6.0	9.4				
Green Ext Time (p_c), s		0.9	0.0	0.8		1.2	0.0	0.4				
Intersection Summary												
HCM 6th Ctrl Delay			28.7									
HCM 6th LOS			C									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

HCM 6th Signalized Intersection Summary

4: Marlow Rd & Guerneville Rd

Lance Drive Residential TIA
Near Term PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	180	410	130	270	460	120	140	620	170	70	730	80
Future Volume (veh/h)	180	410	130	270	460	120	140	620	170	70	730	80
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	189	432	57	284	484	107	147	653	91	74	768	78
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	218	578	406	312	631	139	174	789	621	243	847	86
Arrive On Green	0.12	0.16	0.16	0.18	0.22	0.22	0.10	0.22	0.22	0.05	0.09	0.09
Sat Flow, veh/h	1767	3526	1535	1767	2860	628	1767	3526	1537	1767	3224	327
Grp Volume(v), veh/h	189	432	57	284	297	294	147	653	91	74	420	426
Grp Sat Flow(s),veh/h/ln	1767	1763	1535	1767	1763	1725	1767	1763	1537	1767	1763	1789
Q Serve(g_s), s	12.6	14.0	1.4	18.9	19.0	19.2	9.8	21.2	0.0	4.9	28.3	28.3
Cycle Q Clear(g_c), s	12.6	14.0	1.4	18.9	19.0	19.2	9.8	21.2	0.0	4.9	28.3	28.3
Prop In Lane	1.00		1.00	1.00		0.36	1.00		1.00	1.00		0.18
Lane Grp Cap(c), veh/h	218	578	406	312	389	380	174	789	621	243	463	470
V/C Ratio(X)	0.87	0.75	0.14	0.91	0.76	0.77	0.85	0.83	0.15	0.31	0.91	0.91
Avail Cap(c_a), veh/h	284	831	516	349	480	470	202	1064	741	243	480	488
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	0.97	0.97	0.97	0.58	0.58	0.58	0.82	0.82	0.82
Uniform Delay (d), s/veh	51.7	47.8	9.0	48.5	43.8	43.9	53.2	44.4	22.9	51.7	53.3	53.3
Incr Delay (d2), s/veh	19.5	2.2	0.2	25.1	13.0	13.7	15.6	2.4	0.1	0.6	17.5	17.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.7	6.2	0.8	10.3	9.5	9.5	5.0	9.3	1.6	2.2	15.6	15.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	71.2	50.0	9.1	73.6	56.8	57.7	68.8	46.8	23.0	52.3	70.8	70.7
LnGrp LOS	E	D	A	E	E	E	E	D	C	D	E	E
Approach Vol, veh/h	678			875			891			920		
Approach Delay, s/veh	52.5			62.5			48.0			69.3		
Approach LOS	D			E			D			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	26.9	25.4	17.1	36.8	20.1	32.2	21.8	32.2				
Change Period (Y+Rc), s	5.7	* 5.7	5.3	5.3	5.3	5.7	5.3	5.3				
Max Green Setting (Gmax), s	28.3	* 28	13.7	32.7	19.3	32.7	10.2	36.2				
Max Q Clear Time (g_c+20), s	20.9	16.0	11.8	30.3	14.6	21.2	6.9	23.2				
Green Ext Time (p_c), s	0.2	2.2	0.1	1.2	0.2	2.6	0.0	3.7				

Intersection Summary

HCM 6th Ctrl Delay 58.5

HCM 6th LOS E

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary 5: Ridley Ave & Guerneville Rd

Lance Drive Residential TIA
Near Term PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	630	40	70	810	20	20	10	50	20	10	20
Future Volume (veh/h)	20	630	40	70	810	20	20	10	50	20	10	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	22	677	42	75	871	22	22	11	3	22	11	0
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	588	3004	186	688	3129	79	89	35	7	96	38	0
Arrive On Green	0.89	0.89	0.89	0.89	0.89	0.89	0.05	0.05	0.05	0.05	0.05	0.00
Sat Flow, veh/h	618	3371	209	727	3511	89	800	681	135	891	737	0
Grp Volume(v), veh/h	22	354	365	75	437	456	36	0	0	33	0	0
Grp Sat Flow(s), veh/h/ln	618	1763	1817	727	1763	1837	1616	0	0	1628	0	0
Q Serve(g_s), s	0.6	3.3	3.3	1.9	4.3	4.3	0.3	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	4.9	3.3	3.3	5.2	4.3	4.3	2.4	0.0	0.0	2.1	0.0	0.0
Prop In Lane	1.00		0.11	1.00		0.05	0.61		0.08	0.67		0.00
Lane Grp Cap(c), veh/h	588	1571	1620	688	1571	1637	131	0	0	133	0	0
V/C Ratio(X)	0.04	0.23	0.23	0.11	0.28	0.28	0.27	0.00	0.00	0.25	0.00	0.00
Avail Cap(c_a), veh/h	588	1571	1620	688	1571	1637	470	0	0	471	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.91	0.91	0.91	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	1.3	0.9	0.9	1.2	0.9	0.9	55.1	0.0	0.0	55.0	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.3	0.3	0.0	0.0	0.0	0.4	0.0	0.0	0.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.3	0.3	0.1	0.2	0.2	1.1	0.0	0.0	1.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	1.4	1.2	1.2	1.3	1.0	1.0	55.5	0.0	0.0	55.3	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	E	A	A	E	A	A
Approach Vol, veh/h	741			968			36			33		
Approach Delay, s/veh	1.2			1.0			55.5			55.3		
Approach LOS	A			A			E			E		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	110.8			9.2			110.8			9.2		
Change Period (Y+Rc), s	3.9			3.0			3.9			3.0		
Max Green Setting (Gmax), s	80.1			33.0			80.1			33.0		
Max Q Clear Time (g_c+I1), s	6.9			4.1			7.2			4.4		
Green Ext Time (p_c), s	1.4			0.1			2.0			0.1		

Intersection Summary

HCM 6th Ctrl Delay	3.2
HCM 6th LOS	A

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

6: Lance Dr & Guerneville Rd

Lance Drive Residential TIA
Near Term PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	590	20	60	890	100	10	30	40	50	40	30
Future Volume (veh/h)	50	590	20	60	890	100	10	30	40	50	40	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	0.99		0.99	0.99		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	52	615	20	62	927	87	10	31	5	52	42	19
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	73	684	22	212	970	422	58	143	20	109	74	28
Arrive On Green	0.01	0.06	0.06	0.24	0.55	0.55	0.10	0.10	0.10	0.10	0.10	0.10
Sat Flow, veh/h	1767	3482	113	1767	3526	1535	206	1370	192	622	706	269
Grp Volume(v), veh/h	52	311	324	62	927	87	46	0	0	113	0	0
Grp Sat Flow(s), veh/h/ln	1767	1763	1832	1767	1763	1535	1769	0	0	1597	0	0
Q Serve(g_s), s	3.5	21.0	21.1	3.4	29.9	3.4	0.0	0.0	0.0	5.2	0.0	0.0
Cycle Q Clear(g_c), s	3.5	21.0	21.1	3.4	29.9	3.4	2.8	0.0	0.0	8.0	0.0	0.0
Prop In Lane	1.00		0.06	1.00		1.00	0.22		0.11	0.46		0.17
Lane Grp Cap(c), veh/h	73	346	360	212	970	422	221	0	0	210	0	0
V/C Ratio(X)	0.71	0.90	0.90	0.29	0.96	0.21	0.21	0.00	0.00	0.54	0.00	0.00
Avail Cap(c_a), veh/h	202	848	881	212	1695	738	512	0	0	478	0	0
HCM Platoon Ratio	0.33	0.33	0.33	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.92	0.92	0.92	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	58.5	54.9	54.9	41.4	26.3	20.3	49.4	0.0	0.0	51.6	0.0	0.0
Incr Delay (d2), s/veh	4.8	3.4	3.4	0.3	18.8	1.0	0.2	0.0	0.0	0.8	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	10.3	10.7	1.4	10.7	1.3	1.3	0.0	0.0	3.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	63.3	58.4	58.3	41.7	45.1	21.3	49.6	0.0	0.0	52.4	0.0	0.0
LnGrp LOS	E	E	E	D	D	C	D	A	A	D	A	A
Approach Vol, veh/h	687			1076			46			113		
Approach Delay, s/veh	58.7			43.0			49.6			52.4		
Approach LOS	E			D			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	28.9	28.9		17.1	10.2	38.3		17.1				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		4.6				
Max Green Setting (Gmax), s	57.7	57.7		33.4	13.7	57.7		33.4				
Max Q Clear Time (g_c+15), s	23.1	23.1		10.0	5.5	31.9		4.8				
Green Ext Time (p_c), s	0.0	0.5		0.1	0.0	1.1		0.0				

Intersection Summary

HCM 6th Ctrl Delay	49.3
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

7: N Dutton Ave/Westberry Dr & Guerneville Rd

Lance Drive Residential TIA
Near Term PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	620	100	460	850	20	160	10	450	10	10	10
Future Volume (veh/h)	10	620	100	460	850	20	160	10	450	10	10	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.99	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	11	667	100	495	914	21	180	0	133	11	11	7
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	27	719	108	1663	2480	57	237	0	867	28	28	18
Arrive On Green	0.02	0.23	0.23	0.97	1.00	1.00	0.07	0.00	0.07	0.04	0.04	0.04
Sat Flow, veh/h	1767	3064	459	3428	3520	81	3534	0	1558	658	658	419
Grp Volume(v), veh/h	11	383	384	495	458	477	180	0	133	29	0	0
Grp Sat Flow(s), veh/h/ln	1767	1763	1760	1714	1763	1838	1767	0	1558	1734	0	0
Q Serve(g_s), s	0.7	25.5	25.6	0.7	0.0	0.0	6.0	0.0	0.0	2.0	0.0	0.0
Cycle Q Clear(g_c), s	0.7	25.5	25.6	0.7	0.0	0.0	6.0	0.0	0.0	2.0	0.0	0.0
Prop In Lane	1.00		0.26	1.00		0.04	1.00		1.00	0.38		0.24
Lane Grp Cap(c), veh/h	27	414	413	1663	1242	1295	237	0	867	74	0	0
V/C Ratio(X)	0.41	0.93	0.93	0.30	0.37	0.37	0.76	0.00	0.15	0.39	0.00	0.00
Avail Cap(c_a), veh/h	88	535	534	1663	1242	1295	345	0	915	400	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.97	0.97	0.97	0.71	0.71	0.71	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	58.5	44.9	44.9	0.9	0.0	0.0	55.0	0.0	13.2	55.9	0.0	0.0
Incr Delay (d2), s/veh	3.5	28.6	28.9	0.0	0.6	0.6	2.9	0.0	0.0	1.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	14.1	14.2	0.2	0.2	0.2	2.7	0.0	1.7	0.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	62.0	73.5	73.9	1.0	0.6	0.6	57.9	0.0	13.2	57.2	0.0	0.0
LnGrp LOS	E	E	E	A	A	A	E	A	B	E	A	A
Approach Vol, veh/h	778			1430			313			29		
Approach Delay, s/veh	73.5			0.7			38.9			57.2		
Approach LOS	E			A			D			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	63.5	33.5		9.7	7.1	89.8		13.3				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		5.3				
Max Green Setting (Gmax), s	27.7	36.4		27.7	6.0	54.1		11.7				
Max Q Clear Time (g_c+I1), s	27.6			4.0	2.7	2.0		8.0				
Green Ext Time (p_c), s	0.1	0.6		0.0	0.0	0.8		0.0				

Intersection Summary

HCM 6th Ctrl Delay 28.3

HCM 6th LOS C

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

8: Herbert St/Coffey Ln & Guerneville Rd

Lance Drive Residential TIA
Near Term PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	180	840	60	50	1080	90	40	20	30	100	30	230
Future Volume (veh/h)	180	840	60	50	1080	90	40	20	30	100	30	230
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.99	1.00		0.93	1.00		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	196	913	61	54	1174	94	43	22	16	109	33	51
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	158	948	63	600	1764	141	82	42	31	164	50	318
Arrive On Green	0.18	0.57	0.57	0.34	0.53	0.53	0.09	0.09	0.09	0.12	0.12	0.12
Sat Flow, veh/h	1767	3343	223	1767	3304	264	913	467	340	1372	415	1486
Grp Volume(v), veh/h	196	481	493	54	626	642	81	0	0	142	0	51
Grp Sat Flow(s), veh/h/ln	1767	1763	1804	1767	1763	1805	1719	0	0	1787	0	1486
Q Serve(g_s), s	10.7	31.3	31.3	2.5	30.8	30.9	5.4	0.0	0.0	9.1	0.0	3.4
Cycle Q Clear(g_c), s	10.7	31.3	31.3	2.5	30.8	30.9	5.4	0.0	0.0	9.1	0.0	3.4
Prop In Lane	1.00		0.12	1.00		0.15	0.53		0.20	0.77		1.00
Lane Grp Cap(c), veh/h	158	500	511	600	941	964	155	0	0	214	0	318
V/C Ratio(X)	1.24	0.96	0.96	0.09	0.66	0.67	0.52	0.00	0.00	0.66	0.00	0.16
Avail Cap(c_a), veh/h	158	623	637	600	941	964	358	0	0	387	0	462
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.86	0.86	0.86	0.81	0.81	0.81	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	49.3	25.4	25.4	27.0	20.2	20.2	52.2	0.0	0.0	50.5	0.0	38.9
Incr Delay (d2), s/veh	147.1	29.3	28.9	0.0	3.0	3.0	1.0	0.0	0.0	1.3	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	12.3	12.5	1.0	12.6	13.0	2.4	0.0	0.0	4.1	0.0	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	196.4	54.7	54.3	27.0	23.2	23.2	53.2	0.0	0.0	51.9	0.0	39.0
LnGrp LOS	F	D	D	C	C	C	D	A	A	D	A	D
Approach Vol, veh/h	1170			1322			81			193		
Approach Delay, s/veh	78.3			23.4			53.2			48.5		
Approach LOS	E			C			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	46.1	39.3		19.2	16.0	69.4		15.4				
Change Period (Y+Rc), s	5.3	5.3		4.9	5.3	5.3		4.6				
Max Green Setting (Gmax), s	60.5	42.4		26.0	10.7	38.2		25.0				
Max Q Clear Time (g_c+14), s	14.5	33.3		11.1	12.7	32.9		7.4				
Green Ext Time (p_c), s	0.0	0.7		0.1	0.0	0.9		0.1				
Intersection Summary												
HCM 6th Ctrl Delay	49.2											
HCM 6th LOS	D											

HCM 6th Signalized Intersection Summary

9: Range Ave & Guerneville Rd

Lance Drive Residential TIA
Near Term PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	150	600	200	90	730	20	270	160	140	100	220	240
Future Volume (veh/h)	150	600	200	90	730	20	270	160	140	100	220	240
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	156	625	0	94	760	0	173	318	71	104	229	78
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	579	1753		117	831		276	458	100	194	282	92
Arrive On Green	0.66	0.99	0.00	0.07	0.24	0.00	0.16	0.16	0.16	0.04	0.04	0.04
Sat Flow, veh/h	1767	3618	0	1767	3618	0	1767	2931	643	1767	2568	843
Grp Volume(v), veh/h	156	625	0	94	760	0	173	199	190	104	155	152
Grp Sat Flow(s),veh/h/ln	1767	1763	0	1767	1763	0	1767	1856	1719	1767	1763	1648
Q Serve(g_s), s	4.4	0.2	0.0	6.3	25.2	0.0	11.0	12.2	12.6	6.9	10.4	11.0
Cycle Q Clear(g_c), s	4.4	0.2	0.0	6.3	25.2	0.0	11.0	12.2	12.6	6.9	10.4	11.0
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.37	1.00		0.51
Lane Grp Cap(c), veh/h	579	1753		117	831		276	290	268	194	193	181
V/C Ratio(X)	0.27	0.36		0.80	0.91		0.63	0.69	0.71	0.54	0.80	0.84
Avail Cap(c_a), veh/h	579	1753		143	1002		486	510	473	246	245	229
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	0.80	0.80	0.00	0.94	0.94	0.00	1.00	1.00	1.00	0.59	0.59	0.59
Uniform Delay (d), s/veh	14.7	0.2	0.0	55.3	44.7	0.0	47.4	47.9	48.0	54.8	56.5	56.8
Incr Delay (d2), s/veh	0.1	0.5	0.0	18.3	9.7	0.0	0.9	1.1	1.3	0.5	6.5	10.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	0.2	0.0	3.4	12.0	0.0	4.9	5.7	5.5	3.2	5.2	5.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.7	0.6	0.0	73.5	54.4	0.0	48.2	49.0	49.3	55.3	63.0	67.4
LnGrp LOS	B	A		E	D		D	D	D	E	E	E
Approach Vol, veh/h	781		A	854		A	562			411		
Approach Delay, s/veh	3.4			56.5			48.9			62.7		
Approach LOS	A			E			D			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	3.2	65.0		18.5	44.6	33.6		23.3				
Change Period (Y+Rc), s	5.3	5.3		5.3	5.3	5.3		4.6				
Max Green Setting (Gmax), s	40.1	40.1		16.7	15.7	34.1		33.0				
Max Q Clear Time (g_c+1/3), s	2.2	2.2		13.0	6.4	27.2		14.6				
Green Ext Time (p_c), s	0.0	0.7		0.1	0.0	0.8		0.3				

Intersection Summary

HCM 6th Ctrl Delay	39.9
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.













Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

10: Guerneville Rd & Steele Wy

Lance Drive Residential TIA
Near Term PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	710	100	130	750	10	70	40	160	320	50	20
Future Volume (veh/h)	20	710	100	130	750	10	70	40	160	320	50	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	20	724	75	133	765	10	56	62	71	363	0	8
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	708	2024	1012	200	827	11	137	144	211	456	0	826
Arrive On Green	0.27	0.38	0.38	0.06	0.23	0.23	0.08	0.08	0.08	0.13	0.00	0.13
Sat Flow, veh/h	1767	3526	1550	3428	3563	47	1767	1856	1530	3534	0	1526
Grp Volume(v), veh/h	20	724	75	133	378	397	56	62	71	363	0	8
Grp Sat Flow(s),veh/h/ln	1767	1763	1550	1714	1763	1847	1767	1856	1530	1767	0	1526
Q Serve(g_s), s	1.0	17.6	3.0	4.6	25.2	25.2	3.6	3.8	5.0	12.0	0.0	0.0
Cycle Q Clear(g_c), s	1.0	17.6	3.0	4.6	25.2	25.2	3.6	3.8	5.0	12.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.03	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	708	2024	1012	200	409	429	137	144	211	456	0	826
V/C Ratio(X)	0.03	0.36	0.07	0.67	0.92	0.92	0.41	0.43	0.34	0.80	0.00	0.01
Avail Cap(c_a), veh/h	708	2024	1012	271	580	608	398	417	436	798	0	974
HCM Platoon Ratio	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.86	0.86	0.86	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	26.7	21.1	11.3	55.4	45.0	45.0	52.7	52.8	47.0	50.7	0.0	13.4
Incr Delay (d2), s/veh	0.0	0.4	0.1	1.4	13.8	13.4	0.7	0.8	0.3	1.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	7.8	1.3	2.0	12.4	12.9	1.6	1.8	1.9	5.4	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.7	21.6	11.4	56.8	58.9	58.4	53.4	53.6	47.3	51.9	0.0	13.4
LnGrp LOS	C	C	B	E	E	E	D	D	D	D	A	B
Approach Vol, veh/h	819				908		189				371	
Approach Delay, s/veh	20.7				58.4		51.2				51.1	
Approach LOS	C				E		D				D	
Timer - Assigned Phs	1	2	4		5	6	8					
Phs Duration (G+Y+Rc), s	1.9	73.8	20.4		52.9	32.8	13.9					
Change Period (Y+Rc), s	4.9	4.9	4.9		4.9	4.9	4.6					
Max Green Setting (Gmax), s	27.5	37.1	27.1		7.1	39.5	27.0					
Max Q Clear Time (g_c+10), s	19.6	19.6	14.0		3.0	27.2	7.0					
Green Ext Time (p_c), s	0.0	0.9	0.1		0.0	0.7	0.1					

Intersection Summary

HCM 6th Ctrl Delay 43.1

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

11: Cleveland Ave & Guerneville Rd

Lance Drive Residential TIA
Near Term PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	RT ↑↑	↑↑		RT ↑↑	↑↑	RT	RT	↑↑		RT	↑↑	
Traffic Volume (veh/h)	110	1020	80	310	1190	200	90	130	230	410	340	120
Future Volume (veh/h)	110	1020	80	310	1190	200	90	130	230	410	340	120
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.98	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	115	1062	75	323	1240	142	94	135	46	296	538	106
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	196	1532	108	377	1307	571	366	539	176	356	604	118
Arrive On Green	0.06	0.32	0.32	0.07	0.25	0.25	0.21	0.21	0.21	0.20	0.20	0.20
Sat Flow, veh/h	3428	4821	340	3428	3526	1539	1767	2599	849	1767	2996	587
Grp Volume(v), veh/h	115	744	393	323	1240	142	94	90	91	296	332	312
Grp Sat Flow(s), veh/h/ln	1714	1689	1784	1714	1763	1539	1767	1763	1685	1767	1856	1728
Q Serve(g_s), s	3.9	23.1	23.2	11.2	41.5	8.9	5.3	5.1	5.4	19.3	20.9	21.1
Cycle Q Clear(g_c), s	3.9	23.1	23.2	11.2	41.5	8.9	5.3	5.1	5.4	19.3	20.9	21.1
Prop In Lane	1.00		0.19	1.00		1.00	1.00		0.50	1.00		0.34
Lane Grp Cap(c), veh/h	196	1073	567	377	1307	571	366	365	349	356	374	348
V/C Ratio(X)	0.59	0.69	0.69	0.86	0.95	0.25	0.26	0.25	0.26	0.83	0.89	0.90
Avail Cap(c_a), veh/h	203	1073	567	506	1384	604	366	365	349	443	465	433
HCM Platoon Ratio	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.52	0.52	0.52	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	55.2	35.8	35.8	54.6	44.0	31.7	39.8	39.7	39.9	46.0	46.6	46.7
Incr Delay (d2), s/veh	2.6	1.6	3.1	4.6	7.9	0.0	1.7	1.6	1.8	8.7	14.2	16.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	9.6	10.4	5.2	20.1	3.4	2.5	2.4	2.4	9.2	11.0	10.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.8	37.4	38.9	59.2	51.9	31.7	41.5	41.3	41.7	54.6	60.8	62.7
LnGrp LOS	E	D	D	E	D	C	D	D	D	D	E	E
Approach Vol, veh/h	1252			1705			275			940		
Approach Delay, s/veh	39.8			51.6			41.5			59.5		
Approach LOS	D			D			D			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	43.0	43.0		29.8	11.7	49.4		29.1				
Change Period (Y+Rc), s	4.9	4.9		4.9	4.9	4.9		4.9				
Max Green Setting (Gmax), s	36.5	36.5		16.1	7.1	47.1		30.1				
Max Q Clear Time (g_c+I1), s	25.2	25.2		7.4	5.9	43.5		23.1				
Green Ext Time (p_c), s	0.0	1.3		0.1	0.0	1.0		0.4				

Intersection Summary

HCM 6th Ctrl Delay 49.2

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

12: US 101 SB Ramps & Guerneville Rd

Lance Drive Residential TIA
Near Term PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑					↑	↑	↑
Traffic Volume (veh/h)	0	1130	550	300	1370	0	0	0	0	290	70	330
Future Volume (veh/h)	0	1130	550	300	1370	0	0	0	0	290	70	330
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1856	1856	1856	1856	0				1856	1856	1856
Adj Flow Rate, veh/h	0	1165	176	309	1412	0				186	231	306
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	1393	416	362	1486	0				882	927	785
Arrive On Green	0.00	0.28	0.28	0.11	0.42	0.00				0.50	0.50	0.50
Sat Flow, veh/h	0	5233	1514	3428	3618	0				1767	1856	1572
Grp Volume(v), veh/h	0	1165	176	309	1412	0				186	231	306
Grp Sat Flow(s),veh/h/ln	0	1689	1514	1714	1763	0				1767	1856	1572
Q Serve(g_s), s	0.0	26.0	11.4	10.6	46.4	0.0				7.1	8.5	14.5
Cycle Q Clear(g_c), s	0.0	26.0	11.4	10.6	46.4	0.0				7.1	8.5	14.5
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1393	416	362	1486	0				882	927	785
V/C Ratio(X)	0.00	0.84	0.42	0.85	0.95	0.00				0.21	0.25	0.39
Avail Cap(c_a), veh/h	0	1988	594	546	2089	0				882	927	785
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.56	0.56	0.75	0.75	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	40.9	35.7	52.8	33.5	0.0				16.8	17.2	18.7
Incr Delay (d2), s/veh	0.0	0.9	0.1	4.1	5.6	0.0				0.5	0.6	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	10.7	4.2	4.7	20.2	0.0				2.9	3.6	5.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	41.8	35.8	56.9	39.1	0.0				17.4	17.8	20.1
LnGrp LOS	A	D	D	E	D	A				B	B	C
Approach Vol, veh/h		1341			1721						723	
Approach Delay, s/veh		41.0			42.3						18.7	
Approach LOS		D			D						B	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	7.6	37.9		64.5		55.5						
Change Period (Y+Rc), s	4.9	4.9		4.6		4.9						
Max Green Setting (Gmax), s	47.1			39.4		71.1						
Max Q Clear Time (g_c+I12, s)	28.0			16.5		48.4						
Green Ext Time (p_c), s	0.0	1.7		0.2		2.2						

Intersection Summary

HCM 6th Ctrl Delay	37.3
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 13: US 101 NB Ramps & Guerneville Rd/Steele Ln

Lance Drive Residential TIA
Near Term PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↗↘	↑↑			↑↑↑		↗	↔	↗			
Traffic Volume (veh/h)	400	1030	0	0	1000	240	670	10	330	0	0	0
Future Volume (veh/h)	400	1030	0	0	1000	240	670	10	330	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1856	1856	0	0	1856	1856	1856	1856	1856			
Adj Flow Rate, veh/h	417	1073	0	0	1042	223	788	0	188			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	3	3	0	0	3	3	3	3	3			
Cap, veh/h	1270	2412	0	0	1135	243	836	0	372			
Arrive On Green	0.74	1.00	0.00	0.00	0.27	0.27	0.24	0.00	0.24			
Sat Flow, veh/h	3428	3618	0	0	4326	889	3534	0	1572			
Grp Volume(v), veh/h	417	1073	0	0	846	419	788	0	188			
Grp Sat Flow(s),veh/h/ln	1714	1763	0	0	1689	1671	1767	0	1572			
Q Serve(g_s), s	5.0	0.0	0.0	0.0	29.2	29.2	26.3	0.0	12.4			
Cycle Q Clear(g_c), s	5.0	0.0	0.0	0.0	29.2	29.2	26.3	0.0	12.4			
Prop In Lane	1.00		0.00	0.00		0.53	1.00		1.00			
Lane Grp Cap(c), veh/h	1270	2412	0	0	922	456	836	0	372			
V/C Ratio(X)	0.33	0.44	0.00	0.00	0.92	0.92	0.94	0.00	0.51			
Avail Cap(c_a), veh/h	1270	2412	0	0	1174	581	1249	0	556			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.68	0.68	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	10.4	0.0	0.0	0.0	42.3	42.3	45.0	0.0	39.7			
Incr Delay (d2), s/veh	0.0	0.4	0.0	0.0	8.6	15.4	8.5	0.0	0.4			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	1.6	0.1	0.0	0.0	13.0	13.8	12.1	0.0	4.7			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.5	0.4	0.0	0.0	50.9	57.8	53.5	0.0	40.1			
LnGrp LOS	B	A	A	A	D	E	D	A	D			
Approach Vol, veh/h	1490			1265			976					
Approach Delay, s/veh	3.2			53.2			50.9					
Approach LOS	A			D			D					
Timer - Assigned Phs	2			5			6			8		
Phs Duration (G+Y+Rc), s	87.0			49.4			37.6			33.0		
Change Period (Y+Rc), s	4.9			4.9			4.9			4.6		
Max Green Setting (Gmax), s	68.1			21.5			41.7			42.4		
Max Q Clear Time (g_c+I1), s	2.0			7.0			31.2			28.3		
Green Ext Time (p_c), s	1.5			0.1			1.5			0.1		

Intersection Summary

HCM 6th Ctrl Delay	32.6
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 14: Stony Point Rd/Marlow Rd & W College Ave

Lance Drive Residential TIA
Near Term PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	260	110	220	370	210	160	750	260	170	820	120
Future Volume (veh/h)	80	260	110	220	370	210	160	750	260	170	820	120
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	84	274	76	232	389	155	168	789	151	179	863	117
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	384	346	94	472	434	170	197	950	836	283	990	134
Arrive On Green	0.22	0.13	0.13	0.27	0.18	0.18	0.11	0.27	0.27	0.16	0.32	0.32
Sat Flow, veh/h	1767	2727	740	1767	2459	966	1767	3526	1544	1767	3112	422
Grp Volume(v), veh/h	84	175	175	232	277	267	168	789	151	179	489	491
Grp Sat Flow(s),veh/h/ln	1767	1763	1704	1767	1763	1662	1767	1763	1544	1767	1763	1771
Q Serve(g_s), s	4.7	11.5	12.0	13.3	18.4	18.9	11.2	25.3	2.2	11.4	31.4	31.4
Cycle Q Clear(g_c), s	4.7	11.5	12.0	13.3	18.4	18.9	11.2	25.3	2.2	11.4	31.4	31.4
Prop In Lane	1.00		0.43	1.00		0.58	1.00		1.00	1.00		0.24
Lane Grp Cap(c), veh/h	384	223	216	472	311	293	197	950	836	283	561	563
V/C Ratio(X)	0.22	0.78	0.81	0.49	0.89	0.91	0.85	0.83	0.18	0.63	0.87	0.87
Avail Cap(c_a), veh/h	384	289	280	472	311	293	305	1254	969	349	671	675
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.40	0.40	0.40	1.00	1.00	1.00	0.47	0.47	0.47
Uniform Delay (d), s/veh	38.6	50.8	51.0	37.1	48.3	48.5	52.3	41.2	4.7	47.1	38.6	38.6
Incr Delay (d2), s/veh	0.3	10.0	12.8	0.3	12.6	15.5	13.0	3.7	0.1	1.2	5.4	5.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	5.6	5.8	5.7	9.0	8.9	5.6	11.2	0.9	5.0	14.0	14.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.9	60.8	63.7	37.4	60.9	64.0	65.4	44.9	4.8	48.3	44.0	44.0
LnGrp LOS	D	E	E	D	E	E	E	D	A	D	D	D
Approach Vol, veh/h	434				776		1108				1159	
Approach Delay, s/veh	57.7				55.0		42.6				44.6	
Approach LOS	E				D		D				D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	37.3	20.5	18.7	43.5	31.4	26.5	24.5	37.6				
Change Period (Y+Rc), s	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3				
Max Green Setting (Gmax), s	42.7	19.7	20.7	45.7	12.7	19.7	23.7	42.7				
Max Q Clear Time (g_c+11.5), s	11.5	14.0	13.2	33.4	6.7	20.9	13.4	27.3				
Green Ext Time (p_c), s	0.0	0.9	0.2	4.8	0.1	0.0	0.3	5.1				

Intersection Summary

HCM 6th Ctrl Delay 47.9
HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary 15: N Dutton Ave & W College Ave

Lance Drive Residential TIA
Near Term PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	600	110	180	810	170	160	330	130	300	490	150
Future Volume (veh/h)	90	600	110	180	810	170	160	330	130	300	490	150
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	94	625	103	188	844	162	167	344	100	312	510	130
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	117	683	112	245	901	173	521	414	118	634	605	153
Arrive On Green	0.07	0.23	0.23	0.14	0.31	0.31	0.29	0.15	0.15	0.36	0.22	0.22
Sat Flow, veh/h	1767	3022	497	1767	2942	565	1767	2691	769	1767	2772	703
Grp Volume(v), veh/h	94	364	364	188	506	500	167	223	221	312	323	317
Grp Sat Flow(s),veh/h/ln	1767	1763	1756	1767	1763	1743	1767	1763	1698	1767	1763	1712
Q Serve(g_s), s	6.3	24.2	24.3	12.3	33.5	33.5	8.8	14.7	15.2	16.5	21.1	21.3
Cycle Q Clear(g_c), s	6.3	24.2	24.3	12.3	33.5	33.5	8.8	14.7	15.2	16.5	21.1	21.3
Prop In Lane	1.00		0.28	1.00		0.32	1.00		0.45	1.00		0.41
Lane Grp Cap(c), veh/h	117	399	397	245	540	534	521	271	261	634	384	373
V/C Ratio(X)	0.80	0.91	0.92	0.77	0.94	0.94	0.32	0.82	0.84	0.49	0.84	0.85
Avail Cap(c_a), veh/h	147	457	455	280	589	583	521	457	440	634	516	501
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.81	0.81	0.81	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	55.3	45.3	45.3	49.8	40.5	40.5	33.0	49.2	49.4	30.0	44.9	45.0
Incr Delay (d2), s/veh	14.7	16.9	17.4	8.8	21.1	21.2	0.1	2.4	3.0	0.2	7.1	7.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	12.3	12.3	6.0	17.4	17.2	3.8	6.6	6.6	6.9	9.7	9.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	69.9	62.1	62.7	58.7	61.6	61.8	33.1	51.6	52.3	30.2	52.0	52.8
LnGrp LOS	E	E	E	E	E	E	C	D	D	C	D	D
Approach Vol, veh/h	822		1194				611			952		
Approach Delay, s/veh	63.3		61.2				46.8			45.1		
Approach LOS	E		E				D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	30.5	31.0	38.3	30.1	10.9	40.6	46.0	22.4				
Change Period (Y+Rc), s	3.9	* 3.9	3.0	3.9	3.0	3.9	3.0	3.9				
Max Green Setting (Gmax), s	30.0	* 31	21.0	35.1	10.0	40.1	25.0	31.1				
Max Q Clear Time (g_c+14.3)	11.3	26.3	10.8	23.3	8.3	35.5	18.5	17.2				
Green Ext Time (p_c), s	0.0	0.9	0.0	1.1	0.0	1.2	0.1	0.8				

Intersection Summary

HCM 6th Ctrl Delay 54.9

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection

Intersection Delay, s/veh 7.3

Intersection LOS A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	0	0	0	80	0	0	0	70	0	0
Future Vol, veh/h	0	0	0	0	0	80	0	0	0	70	0	0
Peak Hour Factor	0.86	0.86	0.92	0.92	0.86	0.86	0.92	0.92	0.92	0.86	0.92	0.86
Heavy Vehicles, %	3	3	2	2	3	3	2	2	2	3	2	3
Mvmt Flow	0	0	0	0	0	93	0	0	0	81	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0























Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	0	6.9	0	7.8
HCM LOS	-	A	-	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	0%	0%	100%
Vol Thru, %	100%	100%	0%	0%
Vol Right, %	0%	0%	100%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	0	0	80	70
LT Vol	0	0	0	70
Through Vol	0	0	0	0
RT Vol	0	0	80	0
Lane Flow Rate	0	0	93	81
Geometry Grp	1	1	1	1
Degree of Util (X)	0	0	0.09	0.098
Departure Headway (Hd)	4.16	4.165	3.492	4.315
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	0	0	1018	833
Service Time	2.197	2.223	1.543	2.328
HCM Lane V/C Ratio	0	0	0.091	0.097
HCM Control Delay	7.2	7.2	6.9	7.8
HCM Lane LOS	N	N	A	A
HCM 95th-tile Q	0	0	0.3	0.3

HCM 6th Signalized Intersection Summary







1: Marlow Rd & Marlow Ct/W Steele Ln

Lance Drive Residential TIA
Near Term PM (120-140 Seconds)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	0	10	170	10	150	10	650	170	120	740	10
Future Volume (veh/h)	10	0	10	170	10	150	10	650	170	120	740	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.96	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	11	0	0	187	0	89	11	684	118	126	779	10
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	64	0	0	1821	0	941	22	804	1156	150	1071	14
Arrive On Green	0.04	0.00	0.00	0.52	0.00	0.52	0.01	0.23	0.23	0.08	0.30	0.30
Sat Flow, veh/h	1767	0	0	3534	0	1568	1767	3526	1517	1767	3563	46
Grp Volume(v), veh/h	11	0	0	187	0	89	11	684	118	126	385	404
Grp Sat Flow(s),veh/h/ln	1767	0	0	1767	0	1568	1767	1763	1517	1767	1763	1846
Q Serve(g_s), s	0.8	0.0	0.0	3.8	0.0	0.0	0.9	26.0	3.0	9.8	27.4	27.4
Cycle Q Clear(g_c), s	0.8	0.0	0.0	3.8	0.0	0.0	0.9	26.0	3.0	9.8	27.4	27.4
Prop In Lane	1.00		0.00	1.00		1.00	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	64	0	0	1821	0	941	22	804	1156	150	530	555
V/C Ratio(X)	0.17	0.00	0.00	0.10	0.00	0.09	0.50	0.85	0.10	0.84	0.73	0.73
Avail Cap(c_a), veh/h	379	0	0	1821	0	941	64	1010	1245	228	669	700
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.66	0.66	0.66	1.00	1.00	1.00
Uniform Delay (d), s/veh	65.5	0.0	0.0	17.4	0.0	11.9	68.7	51.7	5.0	63.1	43.8	43.8
Incr Delay (d2), s/veh	1.3	0.0	0.0	0.1	0.0	0.2	11.2	3.9	0.0	15.4	3.0	2.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	1.6	0.0	1.2	0.5	11.9	3.4	5.0	12.3	12.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	66.7	0.0	0.0	17.5	0.0	12.1	79.9	55.7	5.0	78.5	46.8	46.7
LnGrp LOS	E	A	A	B	A	B	E	E	A	E	D	D
Approach Vol, veh/h		11			276			813			915	
Approach Delay, s/veh		66.7			15.7			48.6			51.1	
Approach LOS		E			B			D			D	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		76.7	6.6	47.0		9.6	16.8	36.8				
Change Period (Y+Rc), s		4.6	4.9	4.9		4.6	4.9	4.9				
Max Green Setting (Gmax), s		32.8	5.1	53.1		30.0	18.1	40.1				
Max Q Clear Time (g_c+I1), s		5.8	2.9	29.4		2.8	11.8	28.0				
Green Ext Time (p_c), s		0.9	0.0	5.0		0.0	0.1	3.9				
Intersection Summary												
HCM 6th Ctrl Delay			45.3									
HCM 6th LOS			D									
Notes												
User approved pedestrian interval to be less than phase max green.												
User approved volume balancing among the lanes for turning movement.												






















HCM 6th TWSC
2: Iroquois St/Apple Valley Ln & W Steele Ln

Lance Drive Residential TIA
Near Term PM (120-140 Seconds)

Intersection												
Int Delay, s/veh	3.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	30	300	40	40	460	40	40	10	20	30	10	30
Future Vol, veh/h	30	300	40	40	460	40	40	10	20	30	10	30
Conflicting Peds, #/hr	9	0	9	9	0	9	1	0	2	2	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	60	-	-	80	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	32	316	42	42	484	42	42	11	21	32	11	32
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	535	0	0	367	0	0	1022	1029	348	1017	1029	515
Stage 1	-	-	-	-	-	-	410	410	-	598	598	-
Stage 2	-	-	-	-	-	-	612	619	-	419	431	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1028	-	-	1186	-	-	213	233	693	215	233	558
Stage 1	-	-	-	-	-	-	617	594	-	487	489	-
Stage 2	-	-	-	-	-	-	479	479	-	610	581	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1019	-	-	1176	-	-	182	214	686	189	214	553
Mov Cap-2 Maneuver	-	-	-	-	-	-	182	214	-	189	214	-
Stage 1	-	-	-	-	-	-	592	570	-	468	467	-
Stage 2	-	-	-	-	-	-	425	457	-	561	558	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.7			0.6			26.9			23.3		
HCM LOS							D			C		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	237	1019	-	-	1176	-	-	270				
HCM Lane V/C Ratio	0.311	0.031	-	-	0.036	-	-	0.273				
HCM Control Delay (s)	26.9	8.6	-	-	8.2	-	-	23.3				
HCM Lane LOS	D	A	-	-	A	-	-	C				
HCM 95th %tile Q(veh)	1.3	0.1	-	-	0.1	-	-	1.1				

HCM 6th Signalized Intersection Summary 3: Range Ave & W Steele Ln

Lance Drive Residential TIA
Near Term PM (120-140 Seconds)











												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	320	80	60	440	50	90	200	40	60	420	50
Future Volume (veh/h)	40	320	80	60	440	50	90	200	40	60	420	50
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		0.92
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	42	333	4	62	458	33	94	208	0	62	438	45
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	587	1289	15	712	1204	87	115	421	0	167	497	51
Arrive On Green	0.70	0.70	0.70	0.70	0.70	0.70	0.07	0.12	0.00	0.09	0.16	0.16
Sat Flow, veh/h	898	1829	22	1033	1710	123	1767	3618	0	1767	3199	326
Grp Volume(v), veh/h	42	0	337	62	0	491	94	208	0	62	240	243
Grp Sat Flow(s),veh/h/ln	898	0	1851	1033	0	1833	1767	1763	0	1767	1763	1763
Q Serve(g_s), s	2.8	0.0	9.2	3.2	0.0	15.1	7.4	7.7	0.0	4.6	18.6	18.9
Cycle Q Clear(g_c), s	17.9	0.0	9.2	12.4	0.0	15.1	7.4	7.7	0.0	4.6	18.6	18.9
Prop In Lane	1.00		0.01	1.00		0.07	1.00		0.00	1.00		0.19
Lane Grp Cap(c), veh/h	587	0	1304	712	0	1291	115	421	0	167	274	274
V/C Ratio(X)	0.07	0.00	0.26	0.09	0.00	0.38	0.82	0.49	0.00	0.37	0.88	0.89
Avail Cap(c_a), veh/h	587	0	1304	712	0	1291	215	1035	0	177	480	480
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.56	0.56	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.0	0.0	7.5	9.7	0.0	8.3	64.6	57.7	0.0	59.5	57.8	57.9
Incr Delay (d2), s/veh	0.2	0.0	0.5	0.2	0.0	0.9	3.0	0.2	0.0	0.5	3.5	4.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	3.6	0.8	0.0	5.9	3.4	3.4	0.0	2.1	8.5	8.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.2	0.0	7.9	10.0	0.0	9.2	67.6	57.9	0.0	60.0	61.4	62.4
LnGrp LOS	B	A	A	A	A	A	E	E	A	E	E	E
Approach Vol, veh/h		379			553			302			545	
Approach Delay, s/veh		8.4			9.3			60.9			61.7	
Approach LOS		A			A			E			E	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		102.2	12.1	25.6		102.2	17.1	20.6				
Change Period (Y+Rc), s		3.6	3.0	3.9		3.6	3.9	*3.9				
Max Green Setting (Gmax), s		74.4	17.0	38.1		74.4	14.0	*41				
Max Q Clear Time (g_c+l1), s		19.9	9.4	20.9		17.1	6.6	9.7				
Green Ext Time (p_c), s		0.7	0.0	0.8		1.1	0.0	0.4				
Intersection Summary												
HCM 6th Ctrl Delay			33.9									
HCM 6th LOS			C									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

HCM 6th Signalized Intersection Summary

4: Marlow Rd & Guerneville Rd

Lance Drive Residential TIA
Near Term PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	180	410	130	270	460	120	140	620	170	70	730	80
Future Volume (veh/h)	180	410	130	270	460	120	140	620	170	70	730	80
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	189	432	80	284	484	106	147	653	99	74	768	78
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	218	580	407	312	633	138	173	790	622	242	847	86
Arrive On Green	0.12	0.16	0.16	0.18	0.22	0.22	0.10	0.22	0.22	0.14	0.26	0.26
Sat Flow, veh/h	1767	3526	1535	1767	2865	623	1767	3526	1537	1767	3224	327
Grp Volume(v), veh/h	189	432	80	284	297	293	147	653	99	74	420	426
Grp Sat Flow(s),veh/h/ln	1767	1763	1535	1767	1763	1726	1767	1763	1537	1767	1763	1789
Q Serve(g_s), s	12.6	14.0	2.0	18.9	18.9	19.2	9.8	21.2	0.0	4.5	27.6	27.7
Cycle Q Clear(g_c), s	12.6	14.0	2.0	18.9	18.9	19.2	9.8	21.2	0.0	4.5	27.6	27.7
Prop In Lane	1.00		1.00	1.00		0.36	1.00		1.00	1.00		0.18
Lane Grp Cap(c), veh/h	218	580	407	312	390	381	173	790	622	242	463	470
V/C Ratio(X)	0.87	0.75	0.20	0.91	0.76	0.77	0.85	0.83	0.16	0.31	0.91	0.91
Avail Cap(c_a), veh/h	284	831	516	349	480	470	188	1064	741	242	494	501
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.97	0.97	0.97	0.53	0.53	0.53	0.78	0.78	0.78
Uniform Delay (d), s/veh	51.7	47.7	9.1	48.5	43.8	43.9	53.2	44.3	23.0	46.7	42.8	42.8
Incr Delay (d2), s/veh	19.5	2.2	0.2	25.1	12.8	13.5	16.3	2.2	0.1	0.6	16.2	16.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.7	6.2	1.2	10.3	9.4	9.4	5.1	9.3	1.8	2.0	13.9	14.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	71.2	49.9	9.4	73.6	56.5	57.4	69.5	46.6	23.1	47.2	59.0	58.9
LnGrp LOS	E	D	A	E	E	E	E	D	C	D	E	E
Approach Vol, veh/h	701				874				899		920	
Approach Delay, s/veh	51.0				62.4				47.7		58.0	
Approach LOS	D				E				D		E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	26.9	25.4	17.1	36.8	20.1	32.2	21.7	32.2				
Change Period (Y+Rc), s	5.7	* 5.7	5.3	5.3	5.3	5.7	5.3	5.3				
Max Green Setting (Gmax), s	28.3	* 28	12.8	33.6	19.3	32.7	10.2	36.2				
Max Q Clear Time (g_c+20), s	20.9	16.0	11.8	29.7	14.6	21.2	6.5	23.2				
Green Ext Time (p_c), s	0.2	2.3	0.0	1.9	0.2	2.6	0.0	3.7				

Intersection Summary

HCM 6th Ctrl Delay 55.0
HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary

5: Ridley Ave & Guerneville Rd

Lance Drive Residential TIA
Near Term PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	630	40	70	810	20	20	10	50	20	10	20
Future Volume (veh/h)	20	630	40	70	810	20	20	10	50	20	10	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	0.99		0.98	0.99		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	22	677	42	75	871	22	22	11	3	22	11	0
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	610	3049	189	691	3176	80	80	31	6	85	34	0
Arrive On Green	0.90	0.90	0.90	1.00	1.00	1.00	0.05	0.05	0.05	0.05	0.05	0.00
Sat Flow, veh/h	618	3371	209	727	3511	89	828	663	136	909	731	0
Grp Volume(v), veh/h	22	354	365	75	437	456	36	0	0	33	0	0
Grp Sat Flow(s), veh/h/ln	618	1763	1817	727	1763	1837	1626	0	0	1640	0	0
Q Serve(g_s), s	0.5	3.4	3.4	0.4	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.5	3.4	3.4	3.8	0.0	0.0	2.8	0.0	0.0	2.5	0.0	0.0
Prop In Lane	1.00		0.11	1.00		0.05	0.61		0.08	0.67		0.00
Lane Grp Cap(c), veh/h	610	1595	1644	691	1595	1662	116	0	0	119	0	0
V/C Ratio(X)	0.04	0.22	0.22	0.11	0.27	0.27	0.31	0.00	0.00	0.28	0.00	0.00
Avail Cap(c_a), veh/h	610	1595	1644	691	1595	1662	425	0	0	426	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.91	0.91	0.91	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.7	0.8	0.8	0.1	0.0	0.0	65.0	0.0	0.0	64.9	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.3	0.3	0.0	0.0	0.0	0.6	0.0	0.0	0.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.3	0.3	0.0	0.0	0.0	1.3	0.0	0.0	1.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.8	1.1	1.1	0.1	0.0	0.0	65.5	0.0	0.0	65.3	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	E	A	A	E	A	A
Approach Vol, veh/h	741			968			36			33		
Approach Delay, s/veh	1.1			0.0			65.5			65.3		
Approach LOS	A			A			E			E		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	130.5			9.5			130.5			9.5		
Change Period (Y+Rc), s	3.9			3.0			3.9			3.0		
Max Green Setting (Gmax), s	98.1			35.0			98.1			35.0		
Max Q Clear Time (g_c+I1), s	5.4			4.5			5.8			4.8		
Green Ext Time (p_c), s	1.4			0.1			2.0			0.1		

Intersection Summary

HCM 6th Ctrl Delay	3.0
HCM 6th LOS	A

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

6: Lance Dr & Guerneville Rd

Lance Drive Residential TIA
Near Term PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	590	20	60	890	100	10	30	40	50	40	30
Future Volume (veh/h)	50	590	20	60	890	100	10	30	40	50	40	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	0.99		0.99	0.99		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	52	615	20	62	927	87	10	31	5	52	42	19
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	66	656	21	217	964	420	53	137	19	101	70	27
Arrive On Green	0.08	0.38	0.38	0.25	0.55	0.55	0.10	0.10	0.10	0.10	0.10	0.10
Sat Flow, veh/h	1767	3482	113	1767	3526	1535	219	1361	193	637	694	269
Grp Volume(v), veh/h	52	311	324	62	927	87	46	0	0	113	0	0
Grp Sat Flow(s), veh/h/ln	1767	1763	1832	1767	1763	1535	1773	0	0	1600	0	0
Q Serve(g_s), s	4.0	23.8	23.9	4.0	35.2	4.1	0.0	0.0	0.0	6.1	0.0	0.0
Cycle Q Clear(g_c), s	4.0	23.8	23.9	4.0	35.2	4.1	3.3	0.0	0.0	9.4	0.0	0.0
Prop In Lane	1.00		0.06	1.00		1.00	0.22		0.11	0.46		0.17
Lane Grp Cap(c), veh/h	66	332	345	217	964	420	209	0	0	198	0	0
V/C Ratio(X)	0.78	0.94	0.94	0.29	0.96	0.21	0.22	0.00	0.00	0.57	0.00	0.00
Avail Cap(c_a), veh/h	211	903	938	217	1806	786	476	0	0	444	0	0
HCM Platoon Ratio	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.92	0.92	0.92	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	64.2	42.8	42.9	47.8	31.0	24.0	58.1	0.0	0.0	60.7	0.0	0.0
Incr Delay (d2), s/veh	7.3	5.4	5.4	0.2	19.9	1.0	0.2	0.0	0.0	1.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	8.9	9.3	1.7	13.4	1.5	1.5	0.0	0.0	4.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	71.5	48.3	48.2	48.1	50.9	25.0	58.3	0.0	0.0	61.7	0.0	0.0
LnGrp LOS	E	D	D	D	D	C	E	A	A	E	A	A
Approach Vol, veh/h	687			1076			46			113		
Approach Delay, s/veh	50.0			48.7			58.3			61.7		
Approach LOS	D			D			E			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	22.5	31.7		18.7	10.6	43.6		18.7				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		4.6				
Max Green Setting (Gmax), s	60.0	71.7		36.4	16.7	71.7		36.4				
Max Q Clear Time (g_c+10), s	25.9	25.9		11.4	6.0	37.2		5.3				
Green Ext Time (p_c), s	0.0	0.5		0.1	0.0	1.1		0.0				

Intersection Summary

HCM 6th Ctrl Delay 50.2

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

7: N Dutton Ave/Westberry Dr & Guerneville Rd

Lance Drive Residential TIA
Near Term PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	620	100	460	850	20	160	10	450	10	10	10
Future Volume (veh/h)	10	620	100	460	850	20	160	10	450	10	10	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.99	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	11	667	100	495	914	21	180	0	133	11	11	1
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	26	713	107	1784	2598	60	229	0	919	31	31	3
Arrive On Green	0.01	0.23	0.23	1.00	1.00	1.00	0.06	0.00	0.06	0.04	0.04	0.04
Sat Flow, veh/h	1767	3064	459	3428	3520	81	3534	0	1558	859	859	78
Grp Volume(v), veh/h	11	383	384	495	458	477	180	0	133	23	0	0
Grp Sat Flow(s), veh/h/ln	1767	1763	1760	1714	1763	1838	1767	0	1558	1796	0	0
Q Serve(g_s), s	0.9	29.9	29.9	0.0	0.0	0.0	7.0	0.0	0.0	1.8	0.0	0.0
Cycle Q Clear(g_c), s	0.9	29.9	29.9	0.0	0.0	0.0	7.0	0.0	0.0	1.8	0.0	0.0
Prop In Lane	1.00		0.26	1.00		0.04	1.00		1.00	0.48		0.04
Lane Grp Cap(c), veh/h	26	410	409	1784	1301	1357	229	0	919	64	0	0
V/C Ratio(X)	0.42	0.94	0.94	0.28	0.35	0.35	0.79	0.00	0.14	0.36	0.00	0.00
Avail Cap(c_a), veh/h	77	559	558	1784	1301	1357	371	0	982	355	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.98	0.98	0.98	0.73	0.73	0.73	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	68.4	52.7	52.7	0.0	0.0	0.0	64.5	0.0	13.2	65.9	0.0	0.0
Incr Delay (d2), s/veh	3.8	30.4	30.8	0.0	0.5	0.5	2.3	0.0	0.0	1.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	16.5	16.5	0.0	0.2	0.2	3.2	0.0	1.9	0.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	72.1	83.1	83.5	0.0	0.5	0.5	66.8	0.0	13.2	67.1	0.0	0.0
LnGrp LOS	E	F	F	A	A	A	E	A	B	E	A	A
Approach Vol, veh/h	778			1430			313			23		
Approach Delay, s/veh	83.1			0.4			44.0			67.1		
Approach LOS	F			A			D			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	38.2	37.9		9.6	7.4	108.6		14.4				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		5.3				
Max Green Setting (Gmax), s	32.3	44.4		27.7	6.1	71.0		14.7				
Max Q Clear Time (g_c+I1), s	12.6	31.9		3.8	2.9	2.0		9.0				
Green Ext Time (p_c), s	0.1	0.6		0.0	0.0	0.8		0.0				

Intersection Summary

HCM 6th Ctrl Delay 31.7
HCM 6th LOS C

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

8: Herbert St/Coffey Ln & Guerneville Rd

Lance Drive Residential TIA
Near Term PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	180	840	60	50	1080	90	40	20	30	100	30	230
Future Volume (veh/h)	180	840	60	50	1080	90	40	20	30	100	30	230
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.99	1.00		0.93	1.00		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	196	913	61	54	1174	94	43	22	16	109	33	51
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	211	943	63	659	1771	142	79	40	29	157	47	357
Arrive On Green	0.24	0.56	0.56	0.37	0.54	0.54	0.09	0.09	0.09	0.11	0.11	0.11
Sat Flow, veh/h	1767	3343	223	1767	3304	264	912	467	339	1372	415	1483
Grp Volume(v), veh/h	196	481	493	54	626	642	81	0	0	142	0	51
Grp Sat Flow(s), veh/h/ln	1767	1763	1804	1767	1763	1805	1718	0	0	1787	0	1483
Q Serve(g_s), s	15.2	36.7	36.7	2.8	35.7	35.9	6.3	0.0	0.0	10.7	0.0	3.8
Cycle Q Clear(g_c), s	15.2	36.7	36.7	2.8	35.7	35.9	6.3	0.0	0.0	10.7	0.0	3.8
Prop In Lane	1.00		0.12	1.00		0.15	0.53		0.20	0.77		1.00
Lane Grp Cap(c), veh/h	211	497	509	659	945	968	149	0	0	204	0	357
V/C Ratio(X)	0.93	0.97	0.97	0.08	0.66	0.66	0.54	0.00	0.00	0.70	0.00	0.14
Avail Cap(c_a), veh/h	211	742	759	659	945	968	307	0	0	333	0	464
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.86	0.86	0.86	0.81	0.81	0.81	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	52.7	29.9	29.9	28.4	23.4	23.4	61.3	0.0	0.0	59.7	0.0	42.6
Incr Delay (d2), s/veh	38.3	30.3	29.9	0.0	3.0	2.9	1.1	0.0	0.0	1.6	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.0	15.1	15.3	1.2	15.0	15.5	2.8	0.0	0.0	4.9	0.0	1.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	91.0	60.1	59.7	28.4	26.3	26.3	62.4	0.0	0.0	61.2	0.0	42.6
LnGrp LOS	F	E	E	C	C	C	E	A	A	E	A	D
Approach Vol, veh/h	1170			1322			81			193		
Approach Delay, s/veh	65.1			26.4			62.4			56.3		
Approach LOS	E			C			E			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	57.5	44.8		20.9	22.0	80.3		16.7				
Change Period (Y+Rc), s	5.3	5.3		4.9	5.3	5.3		4.6				
Max Green Setting (Gmax), s	58.9	58.9		26.1	16.7	52.1		25.0				
Max Q Clear Time (g_c+14), s	38.7	38.7		12.7	17.2	37.9		8.3				
Green Ext Time (p_c), s	0.0	0.8		0.1	0.0	1.1		0.1				
Intersection Summary												
HCM 6th Ctrl Delay	45.9											
HCM 6th LOS	D											

HCM 6th Signalized Intersection Summary

9: Range Ave & Guerneville Rd

Lance Drive Residential TIA
Near Term PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑		↰	↑↑		↰	↑↑		↰	↑↑	
Traffic Volume (veh/h)	150	600	200	90	730	20	270	160	140	100	220	240
Future Volume (veh/h)	150	600	200	90	730	20	270	160	140	100	220	240
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	156	625	0	94	760	0	173	318	71	104	229	78
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	644	1872		115	817		265	439	96	190	277	91
Arrive On Green	0.73	1.00	0.00	0.07	0.23	0.00	0.15	0.15	0.15	0.04	0.04	0.04
Sat Flow, veh/h	1767	3618	0	1767	3618	0	1767	2930	643	1767	2567	843
Grp Volume(v), veh/h	156	625	0	94	760	0	173	199	190	104	155	152
Grp Sat Flow(s), veh/h/ln	1767	1763	0	1767	1763	0	1767	1856	1718	1767	1763	1647
Q Serve(g_s), s	4.1	0.0	0.0	7.4	29.6	0.0	12.9	14.3	14.8	8.1	12.2	12.9
Cycle Q Clear(g_c), s	4.1	0.0	0.0	7.4	29.6	0.0	12.9	14.3	14.8	8.1	12.2	12.9
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.37	1.00		0.51
Lane Grp Cap(c), veh/h	644	1872		115	817		265	278	257	190	190	177
V/C Ratio(X)	0.24	0.33		0.82	0.93		0.65	0.72	0.74	0.55	0.81	0.86
Avail Cap(c_a), veh/h	644	1872		170	1030		422	443	410	302	301	281
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	0.83	0.83	0.00	0.94	0.94	0.00	1.00	1.00	1.00	0.56	0.56	0.56
Uniform Delay (d), s/veh	12.6	0.0	0.0	64.6	52.7	0.0	56.1	56.7	56.9	64.1	66.1	66.5
Incr Delay (d2), s/veh	0.1	0.4	0.0	10.2	10.7	0.0	1.0	1.3	1.6	0.5	2.4	5.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.1	0.0	3.6	14.2	0.0	5.9	6.8	6.5	3.8	5.9	6.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.7	0.4	0.0	74.8	63.4	0.0	57.1	58.0	58.4	64.7	68.5	71.5
LnGrp LOS	B	A		E	E		E	E	E	E	E	E
Approach Vol, veh/h	781		A	854		A	562			411		
Approach Delay, s/veh	2.9			64.6			57.9			68.6		
Approach LOS	A			E			E			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.4	79.6		20.4	56.3	37.7		25.6				
Change Period (Y+Rc), s	5.3	5.3		5.3	5.3	5.3		4.6				
Max Green Setting (Gmax), s	48.7	48.7		23.9	21.3	40.9		33.4				
Max Q Clear Time (g_c+19.4)	2.0	2.0		14.9	6.1	31.6		16.8				
Green Ext Time (p_c), s	0.0	0.7		0.2	0.0	0.9		0.3				

Intersection Summary

HCM 6th Ctrl Delay 45.3
HCM 6th LOS D

Notes

- User approved pedestrian interval to be less than phase max green.
- User approved volume balancing among the lanes for turning movement.
- Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

10: Guerneville Rd & Steele Wy

Lance Drive Residential TIA
Near Term PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	710	100	130	750	10	70	40	160	320	50	20
Future Volume (veh/h)	20	710	100	130	750	10	70	40	160	320	50	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	20	724	75	133	765	10	56	62	71	363	0	4
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	764	2150	1063	180	819	11	132	139	197	442	0	871
Arrive On Green	0.14	0.20	0.20	0.05	0.23	0.23	0.07	0.07	0.07	0.12	0.00	0.12
Sat Flow, veh/h	1767	3526	1550	3428	3563	47	1767	1856	1528	3534	0	1525
Grp Volume(v), veh/h	20	724	75	133	378	397	56	62	71	363	0	4
Grp Sat Flow(s), veh/h/ln	1767	1763	1550	1714	1763	1847	1767	1856	1528	1767	0	1525
Q Serve(g_s), s	1.4	24.6	4.4	5.4	29.5	29.5	4.2	4.5	6.0	14.0	0.0	0.0
Cycle Q Clear(g_c), s	1.4	24.6	4.4	5.4	29.5	29.5	4.2	4.5	6.0	14.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.03	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	764	2150	1063	180	405	424	132	139	197	442	0	871
V/C Ratio(X)	0.03	0.34	0.07	0.74	0.93	0.93	0.42	0.45	0.36	0.82	0.00	0.00
Avail Cap(c_a), veh/h	764	2150	1063	321	656	687	358	376	393	810	0	1030
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.87	0.87	0.87	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	34.6	31.7	15.7	65.4	52.9	52.9	61.9	62.0	55.9	59.7	0.0	13.7
Incr Delay (d2), s/veh	0.0	0.4	0.1	2.2	10.3	10.0	0.8	0.8	0.4	1.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	11.8	2.1	2.4	14.1	14.7	1.9	2.2	2.3	6.4	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.6	32.0	15.8	67.6	63.2	62.9	62.7	62.8	56.3	61.2	0.0	13.7
LnGrp LOS	C	C	B	E	E	E	E	E	E	E	A	B
Approach Vol, veh/h	819			908			189			367		
Approach Delay, s/veh	30.6			63.7			60.3			60.7		
Approach LOS	C			E			E			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	2.3	90.3		22.4	65.5	37.1		15.1				
Change Period (Y+Rc), s	4.9	4.9		4.9	4.9	4.9		4.6				
Max Green Setting (Gmax), s	47.1			32.1	8.1	52.1		28.4				
Max Q Clear Time (g_c+11), s	26.6			16.0	3.4	31.5		8.0				
Green Ext Time (p_c), s	0.0	0.9		0.1	0.0	0.7		0.1				

Intersection Summary

HCM 6th Ctrl Delay 51.1

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

11: Cleveland Ave & Guerneville Rd

Lance Drive Residential TIA
Near Term PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	RT	LT	RT	RT	LT	RT	RT	LT	RT	RT	LT	RT
Traffic Volume (veh/h)	110	1020	80	310	1190	200	90	130	230	410	340	120
Future Volume (veh/h)	110	1020	80	310	1190	200	90	130	230	410	340	120
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.98	1.00		0.99	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	115	1062	75	323	1240	142	94	135	46	296	538	106
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	169	1493	105	368	1296	566	438	645	211	345	584	115
Arrive On Green	0.05	0.31	0.31	0.11	0.37	0.37	0.25	0.25	0.25	0.19	0.19	0.19
Sat Flow, veh/h	3428	4821	340	3428	3526	1539	1767	2600	850	1767	2996	587
Grp Volume(v), veh/h	115	744	393	323	1240	142	94	90	91	296	332	312
Grp Sat Flow(s), veh/h/ln	1714	1689	1784	1714	1763	1539	1767	1763	1688	1767	1856	1727
Q Serve(g_s), s	4.6	27.3	27.4	13.0	48.0	9.0	5.9	5.6	6.0	22.7	24.6	24.8
Cycle Q Clear(g_c), s	4.6	27.3	27.4	13.0	48.0	9.0	5.9	5.6	6.0	22.7	24.6	24.8
Prop In Lane	1.00		0.19	1.00		1.00	1.00		0.50	1.00		0.34
Lane Grp Cap(c), veh/h	169	1046	552	368	1296	566	438	437	419	345	362	337
V/C Ratio(X)	0.68	0.71	0.71	0.88	0.96	0.25	0.21	0.21	0.22	0.86	0.92	0.93
Avail Cap(c_a), veh/h	198	1093	577	487	1438	628	438	437	419	468	492	458
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.54	0.54	0.54	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	65.4	42.8	42.8	61.6	43.2	30.8	41.8	41.7	41.8	54.5	55.3	55.4
Incr Delay (d2), s/veh	4.9	1.7	3.3	6.4	8.6	0.0	1.1	1.1	1.2	9.0	15.8	17.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	11.6	12.5	6.0	22.1	3.4	2.8	2.6	2.7	10.9	13.0	12.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	70.4	44.5	46.1	68.0	51.8	30.9	42.9	42.8	43.0	63.5	71.0	73.3
LnGrp LOS	E	D	D	E	D	C	D	D	D	E	E	E
Approach Vol, veh/h	1252			1705			275			940		
Approach Delay, s/veh	47.4			53.1			42.9			69.4		
Approach LOS	D			D			D			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	48.3			39.6	11.8	56.4		32.2				
Change Period (Y+Rc), s	4.9	4.9		4.9	4.9	4.9		4.9				
Max Green Setting (Gmax), s	45.3			18.1	8.1	57.1		37.1				
Max Q Clear Time (g_c+11.5), s	29.4			8.0	6.6	50.0		26.8				
Green Ext Time (p_c), s	0.0	1.4		0.1	0.0	1.4		0.5				

Intersection Summary

HCM 6th Ctrl Delay 54.4

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 12: US 101 SB Ramps & Guerneville Rd

Lance Drive Residential TIA
Near Term PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑					↑	↑	↑
Traffic Volume (veh/h)	0	1130	550	300	1370	0	0	0	0	290	70	330
Future Volume (veh/h)	0	1130	550	300	1370	0	0	0	0	290	70	330
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1856	1856	1856	1856	0				1856	1856	1856
Adj Flow Rate, veh/h	0	1165	176	309	1412	0				186	231	306
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	1419	424	354	1476	0				908	953	808
Arrive On Green	0.00	0.28	0.28	0.10	0.42	0.00				0.51	0.51	0.51
Sat Flow, veh/h	0	5233	1514	3428	3618	0				1767	1856	1572
Grp Volume(v), veh/h	0	1165	176	309	1412	0				186	231	306
Grp Sat Flow(s),veh/h/ln	0	1689	1514	1714	1763	0				1767	1856	1572
Q Serve(g_s), s	0.0	30.1	13.3	12.4	54.4	0.0				8.0	9.7	16.5
Cycle Q Clear(g_c), s	0.0	30.1	13.3	12.4	54.4	0.0				8.0	9.7	16.5
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1419	424	354	1476	0				908	953	808
V/C Ratio(X)	0.00	0.82	0.41	0.87	0.96	0.00				0.20	0.24	0.38
Avail Cap(c_a), veh/h	0	2066	618	541	2118	0				908	953	808
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.57	0.57	0.76	0.76	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	47.1	41.0	61.8	39.5	0.0				18.5	18.9	20.6
Incr Delay (d2), s/veh	0.0	0.6	0.1	5.1	6.1	0.0				0.5	0.6	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	12.6	5.0	5.6	24.2	0.0				3.3	4.2	6.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	47.8	41.2	66.9	45.5	0.0				19.0	19.5	21.9
LnGrp LOS	A	D	D	E	D	A				B	B	C
Approach Vol, veh/h		1341			1721						723	
Approach Delay, s/veh		46.9			49.4						20.4	
Approach LOS		D			D						C	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	9.4	44.1		76.5		63.5						
Change Period (Y+Rc), s	4.9	4.9		4.6		4.9						
Max Green Setting (Gmax), s	22.5	57.1		46.4		84.1						
Max Q Clear Time (g_c+I14.4	32.1	32.1		18.5		56.4						
Green Ext Time (p_c), s	0.0	1.7		0.2		2.2						

Intersection Summary

HCM 6th Ctrl Delay 43.0
HCM 6th LOS D

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 13: US 101 NB Ramps & Guerneville Rd/Steele Ln

Lance Drive Residential TIA
Near Term PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↱↱			↱↱↱		↰	↱↱	↱			
Traffic Volume (veh/h)	400	1030	0	0	1000	240	670	10	330	0	0	0
Future Volume (veh/h)	400	1030	0	0	1000	240	670	10	330	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1856	1856	0	0	1856	1856	1856	1856	1856			
Adj Flow Rate, veh/h	417	1073	0	0	1042	223	775	0	160			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	3	3	0	0	3	3	3	3	3			
Cap, veh/h	1357	2472	0	0	1124	240	817	0	363			
Arrive On Green	0.79	1.00	0.00	0.00	0.27	0.27	0.23	0.00	0.23			
Sat Flow, veh/h	3428	3618	0	0	4326	889	3534	0	1572			
Grp Volume(v), veh/h	417	1073	0	0	846	419	775	0	160			
Grp Sat Flow(s),veh/h/ln	1714	1763	0	0	1689	1671	1767	0	1572			
Q Serve(g_s), s	4.7	0.0	0.0	0.0	34.1	34.2	30.2	0.0	12.2			
Cycle Q Clear(g_c), s	4.7	0.0	0.0	0.0	34.1	34.2	30.2	0.0	12.2			
Prop In Lane	1.00		0.00	0.00		0.53	1.00		1.00			
Lane Grp Cap(c), veh/h	1357	2472	0	0	912	451	817	0	363			
V/C Ratio(X)	0.31	0.43	0.00	0.00	0.93	0.93	0.95	0.00	0.44			
Avail Cap(c_a), veh/h	1357	2472	0	0	1209	598	1247	0	555			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.72	0.72	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	9.3	0.0	0.0	0.0	49.7	49.8	53.0	0.0	46.1			
Incr Delay (d2), s/veh	0.0	0.4	0.0	0.0	8.8	15.7	9.0	0.0	0.3			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	1.5	0.1	0.0	0.0	15.4	16.1	14.1	0.0	4.7			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	9.3	0.4	0.0	0.0	58.6	65.5	62.0	0.0	46.4			
LnGrp LOS	A	A	A	A	E	E	E	A	D			
Approach Vol, veh/h	1490			1265			935					
Approach Delay, s/veh	2.9			60.9			59.3					
Approach LOS	A			E			E					
Timer - Assigned Phs	2			5		6	8					
Phs Duration (G+Y+Rc), s	103.1			60.3		42.7	36.9					
Change Period (Y+Rc), s	4.9			4.9		4.9	4.6					
Max Green Setting (Gmax), s	81.1			26.1		50.1	49.4					
Max Q Clear Time (g_c+I1), s	2.0			6.7		36.2	32.2					
Green Ext Time (p_c), s	1.5			0.1		1.6	0.1					

Intersection Summary

HCM 6th Ctrl Delay	37.1
HCM 6th LOS	D










Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 14: Stony Point Rd/Marlow Rd & W College Ave

Lance Drive Residential TIA
Near Term PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	260	110	220	370	210	160	750	260	170	820	120
Future Volume (veh/h)	80	260	110	220	370	210	160	750	260	170	820	120
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	84	274	76	232	389	155	168	789	151	179	863	115
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	414	350	95	537	487	191	191	914	878	278	962	128
Arrive On Green	0.23	0.13	0.13	0.30	0.20	0.20	0.11	0.26	0.26	0.16	0.31	0.31
Sat Flow, veh/h	1767	2727	740	1767	2460	966	1767	3526	1544	1767	3120	416
Grp Volume(v), veh/h	84	175	175	232	277	267	168	789	151	179	488	490
Grp Sat Flow(s),veh/h/ln	1767	1763	1704	1767	1763	1663	1767	1763	1544	1767	1763	1772
Q Serve(g_s), s	5.4	13.4	14.0	14.7	20.9	21.5	13.1	29.9	2.5	13.3	37.0	37.0
Cycle Q Clear(g_c), s	5.4	13.4	14.0	14.7	20.9	21.5	13.1	29.9	2.5	13.3	37.0	37.0
Prop In Lane	1.00		0.43	1.00		0.58	1.00		1.00	1.00		0.23
Lane Grp Cap(c), veh/h	414	226	219	537	349	329	191	914	878	278	543	546
V/C Ratio(X)	0.20	0.77	0.80	0.43	0.79	0.81	0.88	0.86	0.17	0.64	0.90	0.90
Avail Cap(c_a), veh/h	414	327	317	537	501	473	211	1100	960	278	613	617
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.48	0.48	0.48	1.00	1.00	1.00	0.50	0.50	0.50
Uniform Delay (d), s/veh	43.1	59.1	59.3	39.1	53.4	53.6	61.5	49.5	5.1	55.3	46.3	46.3
Incr Delay (d2), s/veh	0.2	6.9	9.0	0.3	2.8	3.4	29.9	6.3	0.1	2.6	8.3	8.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	6.4	6.5	6.4	9.4	9.2	7.4	13.7	1.0	6.1	17.1	17.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.4	66.0	68.3	39.3	56.2	57.1	91.4	55.7	5.2	57.9	54.7	54.6
LnGrp LOS	D	E	E	D	E	E	F	E	A	E	D	D
Approach Vol, veh/h	434			776			1108			1157		
Approach Delay, s/veh	62.5			51.4			54.3			55.1		
Approach LOS	E			D			D			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	47.8	23.3	20.5	48.5	38.1	33.0	27.3	41.6				
Change Period (Y+Rc), s	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3				
Max Green Setting (Gmax), s	47.8	26.0	16.7	48.7	13.6	39.8	21.7	43.7				
Max Q Clear Time (g_c+I16), s	47.8	16.0	15.1	39.0	7.4	23.5	15.3	31.9				
Green Ext Time (p_c), s	0.5	1.3	0.1	4.1	0.1	2.8	0.2	4.4				

Intersection Summary

HCM 6th Ctrl Delay 55.0

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

15: N Dutton Ave & W College Ave

Lance Drive Residential TIA
Near Term PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	600	110	180	810	170	160	330	130	300	490	150
Future Volume (veh/h)	90	600	110	180	810	170	160	330	130	300	490	150
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	94	625	103	188	844	162	167	344	100	312	510	130
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	116	681	112	252	909	175	546	407	116	650	581	147
Arrive On Green	0.07	0.23	0.23	0.14	0.31	0.31	0.31	0.15	0.15	0.37	0.21	0.21
Sat Flow, veh/h	1767	3022	497	1767	2942	565	1767	2691	769	1767	2772	702
Grp Volume(v), veh/h	94	364	364	188	506	500	167	223	221	312	323	317
Grp Sat Flow(s),veh/h/ln	1767	1763	1756	1767	1763	1743	1767	1763	1697	1767	1763	1712
Q Serve(g_s), s	6.8	26.2	26.3	13.3	36.1	36.1	9.4	16.0	16.5	17.6	23.1	23.3
Cycle Q Clear(g_c), s	6.8	26.2	26.3	13.3	36.1	36.1	9.4	16.0	16.5	17.6	23.1	23.3
Prop In Lane	1.00		0.28	1.00		0.32	1.00		0.45	1.00		0.41
Lane Grp Cap(c), veh/h	116	397	396	252	545	539	546	267	257	650	370	359
V/C Ratio(X)	0.81	0.92	0.92	0.75	0.93	0.93	0.31	0.84	0.86	0.48	0.87	0.88
Avail Cap(c_a), veh/h	150	462	461	394	706	699	546	462	445	650	517	502
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.79	0.79	0.79	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	59.9	49.2	49.2	53.5	43.5	43.5	34.3	53.6	53.8	31.6	49.7	49.8
Incr Delay (d2), s/veh	14.2	16.6	17.2	1.7	14.1	14.3	0.1	2.7	3.3	0.2	9.1	10.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	13.3	13.3	6.0	17.6	17.5	4.0	7.2	7.2	7.4	10.9	10.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	74.1	65.8	66.4	55.1	57.6	57.8	34.4	56.3	57.1	31.8	58.8	59.9
LnGrp LOS	E	E	E	E	E	E	C	E	E	C	E	E
Approach Vol, veh/h	822				1194		611				952	
Approach Delay, s/veh	67.0				57.3		50.6				50.3	
Approach LOS	E				E		D				D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	32.4	33.2	43.2	31.2	11.5	44.1	50.8	23.6				
Change Period (Y+Rc), s	3.9	* 3.9	3.0	3.9	3.0	3.9	3.0	3.9				
Max Green Setting (Gmax), s	29.0	* 34	15.0	38.1	11.0	52.1	19.0	34.1				
Max Q Clear Time (g_c+11.5), s	15.3	28.3	11.4	25.3	8.8	38.1	19.6	18.5				
Green Ext Time (p_c), s	0.1	1.0	0.0	1.1	0.0	2.1	0.0	0.8				

Intersection Summary

HCM 6th Ctrl Delay 56.5

HCM 6th LOS E

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection

Intersection Delay, s/veh 7.3

Intersection LOS A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	0	0	0	80	0	0	0	70	0	0
Future Vol, veh/h	0	0	0	0	0	80	0	0	0	70	0	0
Peak Hour Factor	0.86	0.86	0.92	0.92	0.86	0.86	0.92	0.92	0.92	0.86	0.92	0.86
Heavy Vehicles, %	3	3	2	2	3	3	2	2	2	3	2	3
Mvmt Flow	0	0	0	0	0	93	0	0	0	81	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0























Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	0	6.9	0	7.8
HCM LOS	-	A	-	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	0%	0%	100%
Vol Thru, %	100%	100%	0%	0%
Vol Right, %	0%	0%	100%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	0	0	80	70
LT Vol	0	0	0	70
Through Vol	0	0	0	0
RT Vol	0	0	80	0
Lane Flow Rate	0	0	93	81
Geometry Grp	1	1	1	1
Degree of Util (X)	0	0	0.09	0.098
Departure Headway (Hd)	4.16	4.165	3.492	4.315
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	0	0	1018	833
Service Time	2.197	2.223	1.543	2.328
HCM Lane V/C Ratio	0	0	0.091	0.097
HCM Control Delay	7.2	7.2	6.9	7.8
HCM Lane LOS	N	N	A	A
HCM 95th-tile Q	0	0	0.3	0.3

HCM 6th Signalized Intersection Summary







1: Marlow Rd & Marlow Ct/W Steele Ln

Lance Drive Residential TIA
Near Term Plus Project AM (95-120 Seconds)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	10	10	220	10	190	10	521	220	144	500	10
Future Volume (veh/h)	10	10	10	220	10	190	10	521	220	144	500	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		1.00	1.00		0.96	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	12	12	2	265	0	131	12	606	163	167	581	12
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	33	33	6	1651	0	871	25	814	1082	157	1071	22
Arrive On Green	0.04	0.04	0.04	0.47	0.00	0.47	0.01	0.23	0.23	0.09	0.30	0.30
Sat Flow, veh/h	822	822	137	3534	0	1565	1767	3526	1506	1767	3532	73
Grp Volume(v), veh/h	26	0	0	265	0	131	12	606	163	167	290	303
Grp Sat Flow(s),veh/h/ln	1782	0	0	1767	0	1565	1767	1763	1506	1767	1763	1842
Q Serve(g_s), s	1.6	0.0	0.0	4.8	0.0	0.0	0.7	17.6	4.0	9.8	15.1	15.1
Cycle Q Clear(g_c), s	1.6	0.0	0.0	4.8	0.0	0.0	0.7	17.6	4.0	9.8	15.1	15.1
Prop In Lane	0.46		0.08	1.00		1.00	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	72	0	0	1651	0	871	25	814	1082	157	534	558
V/C Ratio(X)	0.36	0.00	0.00	0.16	0.00	0.15	0.49	0.74	0.15	1.06	0.54	0.54
Avail Cap(c_a), veh/h	308	0	0	1651	0	871	80	1026	1173	157	585	611
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.61	0.61	0.61	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.4	0.0	0.0	16.9	0.0	11.8	53.8	39.3	5.6	50.1	32.0	32.0
Incr Delay (d2), s/veh	3.1	0.0	0.0	0.2	0.0	0.4	8.8	1.4	0.0	88.8	0.9	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.0	2.0	0.0	1.6	0.4	7.6	3.7	8.2	6.4	6.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.5	0.0	0.0	17.1	0.0	12.2	62.6	40.7	5.7	138.9	32.8	32.8
LnGrp LOS	D	A	A	B	A	B	E	D	A	F	C	C
Approach Vol, veh/h		26			396			781			760	
Approach Delay, s/veh		54.5			15.5			33.7			56.1	
Approach LOS		D			B			C			E	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		56.0	6.4	38.3		9.3	14.7	30.0				
Change Period (Y+Rc), s		4.6	4.9	4.9		4.9	4.9	4.6				
Max Green Setting (Gmax), s		30.2	5.0	36.5		19.0	9.8	32.0				
Max Q Clear Time (g_c+I1), s		6.8	2.7	17.1		3.6	11.8	19.6				
Green Ext Time (p_c), s		1.4	0.0	3.3		0.1	0.0	3.7				
Intersection Summary												
HCM 6th Ctrl Delay				39.0								
HCM 6th LOS				D								
Notes												
User approved pedestrian interval to be less than phase max green.												
User approved volume balancing among the lanes for turning movement.												






















HCM 6th TWSC
2: Iroquois St/Apple Valley Ln & W Steele Ln

Lance Drive Residential TIA
Near Term Plus Project AM (95-120 Seconds)

Intersection												
Int Delay, s/veh	6.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	30	370	54	23	310	20	61	10	43	20	10	40
Future Vol, veh/h	30	370	54	23	310	20	61	10	43	20	10	40
Conflicting Peds, #/hr	12	0	24	24	0	12	4	0	4	4	0	4
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	60	-	-	80	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	36	446	65	28	373	24	73	12	52	24	12	48
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	409	0	0	535	0	0	1050	1040	507	1040	1060	401
Stage 1	-	-	-	-	-	-	575	575	-	453	453	-
Stage 2	-	-	-	-	-	-	475	465	-	587	607	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1144	-	-	1028	-	-	204	229	564	207	223	647
Stage 1	-	-	-	-	-	-	502	501	-	584	568	-
Stage 2	-	-	-	-	-	-	569	561	-	494	485	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1131	-	-	1005	-	-	167	208	549	168	203	637
Mov Cap-2 Maneuver	-	-	-	-	-	-	167	208	-	168	203	-
Stage 1	-	-	-	-	-	-	475	474	-	559	546	-
Stage 2	-	-	-	-	-	-	498	539	-	421	459	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.5			0.6			40.8			21.4		
HCM LOS							E			C		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	232	1131	-	-	1005	-	-	303				
HCM Lane V/C Ratio	0.592	0.032	-	-	0.028	-	-	0.278				
HCM Control Delay (s)	40.8	8.3	-	-	8.7	-	-	21.4				
HCM Lane LOS	E	A	-	-	A	-	-	C				
HCM 95th %tile Q(veh)	3.4	0.1	-	-	0.1	-	-	1.1				

HCM 6th Signalized Intersection Summary 3: Range Ave & W Steele Ln

Lance Drive Residential TIA
Near Term Plus Project AM (95-120 Seconds)












												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	421	61	50	280	40	40	170	30	30	150	30
Future Volume (veh/h)	40	421	61	50	280	40	40	170	30	30	150	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.95	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	45	478	67	57	318	43	45	193	20	34	170	18
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	730	1142	160	585	1145	155	65	422	43	55	434	45
Arrive On Green	0.72	0.72	0.72	0.72	0.72	0.72	0.04	0.13	0.13	0.03	0.14	0.14
Sat Flow, veh/h	1011	1591	223	854	1597	216	1767	3212	328	1767	3203	334
Grp Volume(v), veh/h	45	0	545	57	0	361	45	105	108	34	92	96
Grp Sat Flow(s),veh/h/ln	1011	0	1814	854	0	1812	1767	1763	1778	1767	1763	1774
Q Serve(g_s), s	1.6	0.0	11.5	2.7	0.0	6.7	2.4	5.2	5.4	1.8	4.5	4.7
Cycle Q Clear(g_c), s	8.2	0.0	11.5	14.3	0.0	6.7	2.4	5.2	5.4	1.8	4.5	4.7
Prop In Lane	1.00		0.12	1.00		0.12	1.00		0.18	1.00		0.19
Lane Grp Cap(c), veh/h	730	0	1302	585	0	1300	65	232	234	55	239	240
V/C Ratio(X)	0.06	0.00	0.42	0.10	0.00	0.28	0.70	0.45	0.46	0.62	0.39	0.40
Avail Cap(c_a), veh/h	730	0	1302	585	0	1300	149	466	470	149	466	469
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.84	0.84	0.84	1.00	1.00	1.00
Uniform Delay (d), s/veh	6.2	0.0	5.4	8.3	0.0	4.7	45.2	38.1	38.2	45.5	37.5	37.5
Incr Delay (d2), s/veh	0.2	0.0	1.0	0.3	0.0	0.5	4.2	0.4	0.4	4.1	0.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	3.7	0.5	0.0	2.2	1.1	2.2	2.3	0.8	1.9	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	6.4	0.0	6.4	8.6	0.0	5.3	49.4	38.5	38.6	49.6	37.8	37.9
LnGrp LOS	A	A	A	A	A	A	D	D	D	D	D	D
Approach Vol, veh/h	590			418				258			222	
Approach Delay, s/veh	6.4			5.7				40.5			39.7	
Approach LOS	A			A				D			D	
Timer - Assigned Phs	2		3	4		6		7	8			
Phs Duration (G+Y+Rc), s	71.8		6.5	16.8		71.8		6.9	16.4			
Change Period (Y+Rc), s	3.6		3.0	3.9		3.6		3.9	* 3.9			
Max Green Setting (Gmax), s	51.4		8.0	25.1		51.4		8.0	* 25			
Max Q Clear Time (g_c+I1), s	13.5		4.4	6.7		16.3		3.8	7.4			
Green Ext Time (p_c), s	1.2		0.0	0.3		0.9		0.0	0.3			
Intersection Summary												
HCM 6th Ctrl Delay	17.1											
HCM 6th LOS	B											
Notes												

HCM 6th Signalized Intersection Summary

4: Marlow Rd & Guerneville Rd

Lance Drive Residential TIA
Near Term Plus Project AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	120	448	150	178	302	101	130	480	180	111	500	90
Future Volume (veh/h)	120	448	150	178	302	101	130	480	180	111	500	90
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No				No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	130	487	97	193	328	84	141	522	73	121	543	84
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	160	678	437	169	561	142	154	693	454	216	707	109
Arrive On Green	0.09	0.19	0.19	0.10	0.20	0.20	0.09	0.20	0.20	0.12	0.23	0.23
Sat Flow, veh/h	1767	3526	1558	1767	2783	702	1767	3526	1540	1767	3052	470
Grp Volume(v), veh/h	130	487	97	193	206	206	141	522	73	121	313	314
Grp Sat Flow(s),veh/h/ln	1767	1763	1558	1767	1763	1722	1767	1763	1540	1767	1763	1759
Q Serve(g_s), s	6.9	12.3	1.8	9.1	10.0	10.3	7.5	13.3	0.0	6.1	15.7	15.9
Cycle Q Clear(g_c), s	6.9	12.3	1.8	9.1	10.0	10.3	7.5	13.3	0.0	6.1	15.7	15.9
Prop In Lane	1.00		1.00	1.00		0.41	1.00		1.00	1.00		0.27
Lane Grp Cap(c), veh/h	160	678	437	169	356	347	154	693	454	216	408	407
V/C Ratio(X)	0.81	0.72	0.22	1.14	0.58	0.59	0.91	0.75	0.16	0.56	0.77	0.77
Avail Cap(c_a), veh/h	177	965	564	169	475	464	154	1065	616	216	557	556
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.99	0.99	0.99	0.60	0.60	0.60	0.90	0.90	0.90
Uniform Delay (d), s/veh	42.4	36.0	5.4	43.0	34.3	34.4	43.0	36.0	24.9	39.3	34.1	34.1
Incr Delay (d2), s/veh	22.6	1.5	0.3	111.5	6.7	7.2	34.0	1.0	0.1	2.9	3.9	4.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	5.2	1.2	9.1	4.8	4.8	4.6	5.6	1.2	2.8	7.0	7.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	65.1	37.5	5.7	154.5	40.9	41.6	77.0	37.0	25.0	42.2	38.0	38.3
LnGrp LOS	E	D	A	F	D	D	E	D	C	D	D	D
Approach Vol, veh/h	714		605			736			748			
Approach Delay, s/veh	38.2		77.4			43.5			38.8			
Approach LOS	D		E			D			D			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	4.8	24.0	13.6	27.3	13.9	24.9	16.9	24.0				
Change Period (Y+Rc), s	5.7	* 5.7	5.3	5.3	5.3	5.7	5.3	5.3				
Max Green Setting (Gmax), s	26	* 26	8.3	30.0	9.5	25.6	9.6	28.7				
Max Q Clear Time (g_c+I1), s	14.3	14.3	9.5	17.9	8.9	12.3	8.1	15.3				
Green Ext Time (p_c), s	0.0	2.6	0.0	3.0	0.0	1.9	0.0	2.9				

Intersection Summary

HCM 6th Ctrl Delay 48.2

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary

5: Ridley Ave & Guerneville Rd

Lance Drive Residential TIA
Near Term Plus Project AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	719	30	66	491	20	40	10	62	40	10	30
Future Volume (veh/h)	30	719	30	66	491	20	40	10	62	40	10	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	0.98		0.97	0.98		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	34	808	33	74	552	21	45	11	22	45	11	9
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	760	2838	116	574	2850	108	138	38	46	166	40	23
Arrive On Green	0.82	0.82	0.82	1.00	1.00	1.00	0.10	0.10	0.10	0.10	0.10	0.10
Sat Flow, veh/h	831	3448	141	648	3462	132	752	367	440	981	379	219
Grp Volume(v), veh/h	34	413	428	74	281	292	78	0	0	65	0	0
Grp Sat Flow(s),veh/h/ln	831	1763	1826	648	1763	1831	1558	0	0	1579	0	0
Q Serve(g_s), s	0.7	5.1	5.1	0.8	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.7	5.1	5.1	6.0	0.0	0.0	4.1	0.0	0.0	3.2	0.0	0.0
Prop In Lane	1.00		0.08	1.00		0.07	0.58		0.28	0.69		0.14
Lane Grp Cap(c), veh/h	760	1451	1503	574	1451	1507	222	0	0	229	0	0
V/C Ratio(X)	0.04	0.28	0.28	0.13	0.19	0.19	0.35	0.00	0.00	0.28	0.00	0.00
Avail Cap(c_a), veh/h	760	1451	1503	574	1451	1507	592	0	0	593	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.92	0.92	0.92	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	1.5	1.9	1.9	0.2	0.0	0.0	39.9	0.0	0.0	39.6	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.5	0.4	0.0	0.0	0.0	0.4	0.0	0.0	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.9	0.9	0.0	0.0	0.0	1.7	0.0	0.0	1.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	1.7	2.4	2.4	0.2	0.0	0.0	40.2	0.0	0.0	39.8	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	D	A	A	D	A	A
Approach Vol, veh/h	875			647			78			65		
Approach Delay, s/veh	2.4			0.0			40.2			39.8		
Approach LOS	A			A			D			D		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	82.1			12.9			82.1			12.9		
Change Period (Y+Rc), s	3.9			3.0			3.9			3.0		
Max Green Setting (Gmax), s	54.1			34.0			54.1			34.0		
Max Q Clear Time (g_c+I1), s	7.1			5.2			8.0			6.1		
Green Ext Time (p_c), s	1.7			0.2			1.3			0.2		

Intersection Summary

HCM 6th Ctrl Delay	4.7
HCM 6th LOS	A

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary 6: Lance Dr & Guerneville Rd

Lance Drive Residential TIA
Near Term Plus Project AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	48	766	30	30	446	89	20	54	70	168	92	109
Future Volume (veh/h)	48	766	30	30	446	89	20	54	70	168	92	109
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	57	912	35	36	531	86	24	64	47	200	110	115
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	87	1003	39	80	1009	440	103	261	171	264	121	122
Arrive On Green	0.02	0.10	0.10	0.01	0.09	0.09	0.30	0.30	0.30	0.30	0.30	0.30
Sat Flow, veh/h	1767	3458	133	1767	3526	1536	194	862	564	687	399	403
Grp Volume(v), veh/h	57	465	482	36	531	86	135	0	0	425	0	0
Grp Sat Flow(s), veh/h/ln	1767	1763	1828	1767	1763	1536	1621	0	0	1489	0	0
Q Serve(g_s), s	3.0	24.8	24.8	1.9	13.6	4.9	0.0	0.0	0.0	20.8	0.0	0.0
Cycle Q Clear(g_c), s	3.0	24.8	24.8	1.9	13.6	4.9	5.6	0.0	0.0	26.4	0.0	0.0
Prop In Lane	1.00		0.07	1.00		1.00	0.18		0.35	0.47		0.27
Lane Grp Cap(c), veh/h	87	511	530	80	1009	440	535	0	0	506	0	0
V/C Ratio(X)	0.66	0.91	0.91	0.45	0.53	0.20	0.25	0.00	0.00	0.84	0.00	0.00
Avail Cap(c_a), veh/h	125	737	764	143	1510	658	596	0	0	563	0	0
HCM Platoon Ratio	0.33	0.33	0.33	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.96	0.96	0.96	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	45.9	41.7	41.7	45.6	36.9	32.9	25.0	0.0	0.0	32.1	0.0	0.0
Incr Delay (d2), s/veh	3.1	9.2	8.9	1.4	1.9	1.0	0.1	0.0	0.0	9.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	12.9	13.3	0.9	6.6	1.9	2.3	0.0	0.0	10.6	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.0	50.9	50.6	47.0	38.8	33.9	25.1	0.0	0.0	41.2	0.0	0.0
LnGrp LOS	D	D	D	D	D	C	C	A	A	D	A	A
Approach Vol, veh/h	1004			653			135			425		
Approach Delay, s/veh	50.7			38.6			25.1			41.2		
Approach LOS	D			D			C			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.6	32.9		33.4	10.0	32.5		33.4				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		4.6				
Max Green Setting (Gmax), s	39.7	39.7		32.4	6.7	40.7		32.4				
Max Q Clear Time (g_c+13), s	26.8	26.8		28.4	5.0	15.6		7.6				
Green Ext Time (p_c), s	0.0	0.7		0.3	0.0	0.6		0.2				

Intersection Summary

HCM 6th Ctrl Delay 43.7
HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

7: N Dutton Ave/Westberry Dr & Guerneville Rd

Lance Drive Residential TIA
Near Term Plus Project AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	939	145	250	492	10	103	10	380	20	10	10
Future Volume (veh/h)	10	939	145	250	492	10	103	10	380	20	10	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	12	1131	169	301	593	11	133	0	147	24	12	5
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	30	1027	153	1179	2341	43	190	0	625	53	27	11
Arrive On Green	0.02	0.33	0.33	0.34	0.66	0.66	0.05	0.00	0.05	0.05	0.05	0.05
Sat Flow, veh/h	1767	3069	457	3428	3539	66	3534	0	1564	1030	515	215
Grp Volume(v), veh/h	12	648	652	301	295	309	133	0	147	41	0	0
Grp Sat Flow(s), veh/h/ln	1767	1763	1763	1714	1763	1842	1767	0	1564	1760	0	0
Q Serve(g_s), s	0.6	31.8	31.8	6.0	6.5	6.5	3.5	0.0	0.0	2.1	0.0	0.0
Cycle Q Clear(g_c), s	0.6	31.8	31.8	6.0	6.5	6.5	3.5	0.0	0.0	2.1	0.0	0.0
Prop In Lane	1.00		0.26	1.00		0.04	1.00		1.00	0.59		0.12
Lane Grp Cap(c), veh/h	30	590	590	1179	1166	1218	190	0	625	91	0	0
V/C Ratio(X)	0.40	1.10	1.10	0.26	0.25	0.25	0.70	0.00	0.24	0.45	0.00	0.00
Avail Cap(c_a), veh/h	112	590	590	1179	1166	1218	190	0	625	513	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.81	0.81	0.81	0.93	0.93	0.93	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	46.2	31.6	31.6	22.4	6.5	6.5	44.2	0.0	19.0	43.7	0.0	0.0
Incr Delay (d2), s/veh	2.5	63.5	65.8	0.0	0.5	0.5	9.4	0.0	0.1	1.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	23.0	23.4	2.3	2.1	2.2	1.7	0.0	2.0	1.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.7	95.1	97.4	22.5	7.0	7.0	53.6	0.0	19.1	45.0	0.0	0.0
LnGrp LOS	D	F	F	C	A	A	D	A	B	D	A	A
Approach Vol, veh/h	1312			905			280			41		
Approach Delay, s/veh	95.8			12.1			35.5			45.0		
Approach LOS	F			B			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	38.0	37.1		9.5	6.9	68.1		10.4				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		5.3				
Max Green Setting (Gmax), s	31.8	31.8		27.7	6.0	35.7		5.1				
Max Q Clear Time (g_c+1/3), s	33.8	33.8		4.1	2.6	8.5		5.5				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	0.5		0.0				

Intersection Summary

HCM 6th Ctrl Delay 58.5

HCM 6th LOS E

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

8: Herbert St/Coffey Ln & Guerneville Rd

Lance Drive Residential TIA
Near Term Plus Project AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	140	1169	30	20	562	40	20	20	20	80	10	160
Future Volume (veh/h)	140	1169	30	20	562	40	20	20	20	80	10	160
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		0.95	1.00		0.94	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	163	1359	34	23	653	44	23	23	6	93	12	53
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	190	1181	30	587	1873	126	50	50	13	146	19	310
Arrive On Green	0.11	0.34	0.34	0.33	0.56	0.56	0.06	0.06	0.06	0.09	0.09	0.09
Sat Flow, veh/h	1767	3509	88	1767	3340	225	780	780	204	1574	203	1510
Grp Volume(v), veh/h	163	682	711	23	344	353	52	0	0	105	0	53
Grp Sat Flow(s), veh/h/ln	1767	1763	1834	1767	1763	1802	1764	0	0	1777	0	1510
Q Serve(g_s), s	10.4	38.7	38.7	1.0	12.3	12.3	3.3	0.0	0.0	6.6	0.0	3.3
Cycle Q Clear(g_c), s	10.4	38.7	38.7	1.0	12.3	12.3	3.3	0.0	0.0	6.6	0.0	3.3
Prop In Lane	1.00		0.05	1.00		0.12	0.44		0.12	0.89		1.00
Lane Grp Cap(c), veh/h	190	593	617	587	989	1011	112	0	0	165	0	310
V/C Ratio(X)	0.86	1.15	1.15	0.04	0.35	0.35	0.46	0.00	0.00	0.63	0.00	0.17
Avail Cap(c_a), veh/h	272	593	617	587	989	1011	383	0	0	403	0	512
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.68	0.68	0.68	0.93	0.93	0.93	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	50.4	38.1	38.2	26.0	13.8	13.8	51.9	0.0	0.0	50.3	0.0	38.1
Incr Delay (d2), s/veh	8.9	80.6	81.1	0.0	0.9	0.9	1.1	0.0	0.0	1.5	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.0	29.2	30.5	0.4	4.8	4.9	1.5	0.0	0.0	3.0	0.0	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.3	118.7	119.2	26.0	14.7	14.7	53.0	0.0	0.0	51.8	0.0	38.2
LnGrp LOS	E	F	F	C	B	B	D	A	A	D	A	D
Approach Vol, veh/h	1556			720			52			158		
Approach Delay, s/veh	112.7			15.0			53.0			47.2		
Approach LOS	F			B			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	43.5	44.0		15.6	17.7	69.8		11.9				
Change Period (Y+Rc), s	5.3	5.3		4.9	5.3	5.3		4.6				
Max Green Setting (Gmax), s	5.3	38.7		26.1	17.7	26.1		25.0				
Max Q Clear Time (g_c+11.3), s	5.3	40.7		8.6	12.4	14.3		5.3				
Green Ext Time (p_c), s	0.0	0.0		0.1	0.0	0.5		0.0				
Intersection Summary												
HCM 6th Ctrl Delay	79.0											
HCM 6th LOS	E											

HCM 6th Signalized Intersection Summary

9: Range Ave & Guerneville Rd

Lance Drive Residential TIA
Near Term Plus Project AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	150	797	152	70	441	10	131	90	80	41	100	110
Future Volume (veh/h)	150	797	152	70	441	10	131	90	80	41	100	110
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.96	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	160	848	0	74	469	0	81	177	8	44	106	17
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	256	939		96	618		169	337	15	129	221	34
Arrive On Green	0.15	0.27	0.00	0.05	0.18	0.00	0.10	0.10	0.10	0.07	0.07	0.07
Sat Flow, veh/h	1767	3618	0	1767	3618	0	1767	3518	158	1767	3034	474
Grp Volume(v), veh/h	160	848	0	74	469	0	81	93	92	44	60	63
Grp Sat Flow(s),veh/h/ln	1767	1763	0	1767	1763	0	1767	1856	1820	1767	1763	1745
Q Serve(g_s), s	8.1	22.1	0.0	3.9	12.0	0.0	4.1	4.5	4.6	2.2	3.1	3.3
Cycle Q Clear(g_c), s	8.1	22.1	0.0	3.9	12.0	0.0	4.1	4.5	4.6	2.2	3.1	3.3
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.09	1.00		0.27
Lane Grp Cap(c), veh/h	256	939		96	618		169	178	174	129	128	127
V/C Ratio(X)	0.62	0.90		0.77	0.76		0.48	0.52	0.53	0.34	0.47	0.49
Avail Cap(c_a), veh/h	256	1058		112	1058		614	645	632	130	130	129
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.74	0.74	0.00	0.97	0.97	0.00	1.00	1.00	1.00	0.86	0.86	0.86
Uniform Delay (d), s/veh	38.2	33.7	0.0	44.3	37.3	0.0	40.7	40.9	40.9	41.9	42.3	42.4
Incr Delay (d2), s/veh	2.6	7.2	0.0	19.7	8.3	0.0	0.8	0.9	0.9	0.5	0.9	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	9.9	0.0	2.2	5.8	0.0	1.8	2.1	2.1	1.0	1.4	1.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.8	40.9	0.0	64.1	45.5	0.0	41.5	41.8	41.8	42.4	43.1	43.3
LnGrp LOS	D	D		E	D		D	D	D	D	D	D
Approach Vol, veh/h	1008		A	543		A	266		167			
Approach Delay, s/veh	40.9			48.1			41.7		43.0			
Approach LOS	D			D			D		D			
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	30.6			12.2	19.1	22.0		13.7				
Change Period (Y+Rc), s	5.3	5.3		5.3	5.3	5.3		4.6				
Max Green Setting (Gmax), s	28.5			7.0	6.0	28.5		33.0				
Max Q Clear Time (g_c+15), s	24.1			5.3	10.1	14.0		6.6				
Green Ext Time (p_c), s	0.0	0.6		0.0	0.0	0.6		0.1				

Intersection Summary

HCM 6th Ctrl Delay	43.1
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

10: Guerneville Rd & Steele Wy

Lance Drive Residential TIA
Near Term Plus Project AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	846	52	60	480	10	31	10	60	391	20	10
Future Volume (veh/h)	30	846	52	60	480	10	31	10	60	391	20	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	34	961	39	68	545	10	23	28	6	460	0	5
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	778	1951	961	218	625	11	103	108	191	527	0	926
Arrive On Green	0.44	0.55	0.55	0.06	0.18	0.18	0.06	0.06	0.06	0.15	0.00	0.15
Sat Flow, veh/h	1767	3526	1571	3428	3540	65	1767	1856	1558	3534	0	1566
Grp Volume(v), veh/h	34	961	39	68	271	284	23	28	6	460	0	5
Grp Sat Flow(s), veh/h/ln	1767	1763	1571	1714	1763	1842	1767	1856	1558	1767	0	1566
Q Serve(g_s), s	1.2	18.4	1.1	2.1	16.5	16.5	1.4	1.6	0.4	14.0	0.0	0.0
Cycle Q Clear(g_c), s	1.2	18.4	1.1	2.1	16.5	16.5	1.4	1.6	0.4	14.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.04	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	778	1951	961	218	311	325	103	108	191	527	0	926
V/C Ratio(X)	0.04	0.49	0.04	0.31	0.87	0.87	0.22	0.26	0.03	0.87	0.00	0.01
Avail Cap(c_a), veh/h	778	1951	961	218	476	497	434	455	482	868	0	1077
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.85	0.85	0.85	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.6	15.1	8.5	49.2	44.1	44.1	49.4	49.5	42.6	45.8	0.0	9.3
Incr Delay (d2), s/veh	0.0	0.8	0.1	0.3	7.2	7.1	0.4	0.5	0.0	3.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	7.2	0.4	0.9	7.7	8.0	0.6	0.7	0.1	6.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.6	15.8	8.6	49.5	51.3	51.1	49.8	50.0	42.6	48.8	0.0	9.3
LnGrp LOS	B	B	A	D	D	D	D	D	D	D	A	A
Approach Vol, veh/h	1034			623			57			465		
Approach Delay, s/veh	15.6			51.0			49.1			48.3		
Approach LOS	B			D			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	1.9	65.8		21.3	53.3	24.3		11.0				
Change Period (Y+Rc), s	4.9	4.9		4.9	4.9	4.9		4.6				
Max Green Setting (Gmax), s	29.7	29.7		27.0	7.0	29.7		27.0				
Max Q Clear Time (g_c+14), s	20.4	20.4		16.0	3.2	18.5		3.6				
Green Ext Time (p_c), s	0.0	1.2		0.1	0.0	0.4		0.0				

Intersection Summary

HCM 6th Ctrl Delay 33.6

HCM 6th LOS C

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

11: Cleveland Ave & Guerneville Rd

Lance Drive Residential TIA
Near Term Plus Project AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↑↑↓		↰↱	↑↑	↱	↰	↑↓		↰	↑↓	
Traffic Volume (veh/h)	60	1237	40	180	850	190	30	90	150	230	70	40
Future Volume (veh/h)	60	1237	40	180	850	190	30	90	150	230	70	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	66	1359	41	198	934	109	33	99	58	253	77	28
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	269	1465	44	266	1020	445	565	700	380	375	137	50
Arrive On Green	0.08	0.29	0.29	0.05	0.19	0.19	0.32	0.32	0.32	0.11	0.11	0.11
Sat Flow, veh/h	3428	5049	152	3428	3526	1536	1767	2190	1189	3534	1292	470
Grp Volume(v), veh/h	66	909	491	198	934	109	33	78	79	253	0	105
Grp Sat Flow(s), veh/h/ln	1714	1689	1824	1714	1763	1536	1767	1763	1616	1767	0	1761
Q Serve(g_s), s	1.7	24.8	24.8	5.4	24.7	5.7	1.2	3.0	3.3	6.5	0.0	5.4
Cycle Q Clear(g_c), s	1.7	24.8	24.8	5.4	24.7	5.7	1.2	3.0	3.3	6.5	0.0	5.4
Prop In Lane	1.00		0.08	1.00		1.00	1.00		0.74	1.00		0.27
Lane Grp Cap(c), veh/h	269	980	529	266	1020	445	565	564	517	375	0	187
V/C Ratio(X)	0.25	0.93	0.93	0.74	0.92	0.25	0.06	0.14	0.15	0.67	0.00	0.56
Avail Cap(c_a), veh/h	269	1034	559	328	1158	505	565	564	517	1008	0	502
HCM Platoon Ratio	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.78	0.78	0.78	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	41.1	32.8	32.8	44.1	37.2	29.5	22.4	23.0	23.1	40.9	0.0	40.4
Incr Delay (d2), s/veh	0.2	13.1	20.7	4.0	8.0	0.1	0.2	0.5	0.6	0.8	0.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	11.5	13.6	2.4	12.0	2.1	0.5	1.3	1.3	2.8	0.0	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.3	45.8	53.5	48.1	45.1	29.6	22.6	23.5	23.7	41.7	0.0	41.3
LnGrp LOS	D	D	D	D	D	C	C	C	C	D	A	D
Approach Vol, veh/h	1466			1241			190			358		
Approach Delay, s/veh	48.2			44.2			23.4			41.6		
Approach LOS	D			D			C			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	2.3	32.5		35.3	12.4	32.4		15.0				
Change Period (Y+Rc), s	4.9	4.9		4.9	4.9	4.9		4.9				
Max Green Setting (Gmax), s	29.1			10.1	7.0	31.2		27.1				
Max Q Clear Time (g_c+11), s	26.8			5.3	3.7	26.7		8.5				
Green Ext Time (p_c), s	0.0	0.7		0.1	0.0	0.8		0.1				

Intersection Summary

HCM 6th Ctrl Delay	44.5
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.
User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 12: US 101 SB Ramps & Guerneville Rd

Lance Drive Residential TIA
Near Term Plus Project AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑					↑	↑	↑
Traffic Volume (veh/h)	0	1084	523	260	912	0	0	0	0	350	10	298
Future Volume (veh/h)	0	1084	523	260	912	0	0	0	0	350	10	298
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1856	1856	1856	1856	0				1856	1856	1856
Adj Flow Rate, veh/h	0	1218	178	292	1025	0				401	0	278
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89				0.89	0.89	0.89
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	1368	417	359	1503	0				1674	0	745
Arrive On Green	0.00	0.27	0.27	0.10	0.43	0.00				0.47	0.00	0.47
Sat Flow, veh/h	0	5233	1544	3428	3618	0				3534	0	1572
Grp Volume(v), veh/h	0	1218	178	292	1025	0				401	0	278
Grp Sat Flow(s),veh/h/ln	0	1689	1544	1714	1763	0				1767	0	1572
Q Serve(g_s), s	0.0	22.0	9.0	7.9	22.3	0.0				6.4	0.0	10.7
Cycle Q Clear(g_c), s	0.0	22.0	9.0	7.9	22.3	0.0				6.4	0.0	10.7
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1368	417	359	1503	0				1674	0	745
V/C Ratio(X)	0.00	0.89	0.43	0.81	0.68	0.00				0.24	0.00	0.37
Avail Cap(c_a), veh/h	0	1925	587	545	2082	0				1674	0	745
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.26	0.26	0.80	0.80	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	33.3	28.6	41.6	22.0	0.0				14.8	0.0	16.0
Incr Delay (d2), s/veh	0.0	0.9	0.1	2.5	0.2	0.0				0.3	0.0	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	8.8	3.3	3.4	8.7	0.0				2.4	0.0	3.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	34.2	28.7	44.1	22.2	0.0				15.2	0.0	17.4
LnGrp LOS	A	C	C	D	C	A				B	A	B
Approach Vol, veh/h		1396			1317						679	
Approach Delay, s/veh		33.5			27.1						16.1	
Approach LOS		C			C						B	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	4.8	30.5		49.6		45.4						
Change Period (Y+Rc), s	4.9	4.9		4.6		4.9						
Max Green Setting (Gmax), s	5.5	36.1		29.4		56.1						
Max Q Clear Time (g_c+I19), s	19.5	24.0		12.7		24.3						
Green Ext Time (p_c), s	0.0	1.7		0.1		1.5						

Intersection Summary

HCM 6th Ctrl Delay	27.5
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 13: US 101 NB Ramps & Guerneville Rd/Steele Ln

Lance Drive Residential TIA
Near Term Plus Project AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↱↱			↱↱↱		↰	↱↱	↱			
Traffic Volume (veh/h)	433	1001	0	0	803	210	369	10	420	0	0	0
Future Volume (veh/h)	433	1001	0	0	803	210	369	10	420	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1856	1856	0	0	1856	1856	1856	1856	1856			
Adj Flow Rate, veh/h	487	1125	0	0	902	207	526	0	231			
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89			
Percent Heavy Veh, %	3	3	0	0	3	3	3	3	3			
Cap, veh/h	1483	2582	0	0	1018	232	592	0	263			
Arrive On Green	0.87	1.00	0.00	0.00	0.25	0.25	0.17	0.00	0.17			
Sat Flow, veh/h	3428	3618	0	0	4266	936	3534	0	1572			
Grp Volume(v), veh/h	487	1125	0	0	742	367	526	0	231			
Grp Sat Flow(s),veh/h/ln	1714	1763	0	0	1689	1658	1767	0	1572			
Q Serve(g_s), s	2.5	0.0	0.0	0.0	20.1	20.3	13.8	0.0	13.6			
Cycle Q Clear(g_c), s	2.5	0.0	0.0	0.0	20.1	20.3	13.8	0.0	13.6			
Prop In Lane	1.00		0.00	0.00		0.56	1.00		1.00			
Lane Grp Cap(c), veh/h	1483	2582	0	0	839	412	592	0	263			
V/C Ratio(X)	0.33	0.44	0.00	0.00	0.89	0.89	0.89	0.00	0.88			
Avail Cap(c_a), veh/h	1483	2582	0	0	1177	578	1094	0	487			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.58	0.58	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	3.8	0.0	0.0	0.0	34.4	34.5	38.7	0.0	38.6			
Incr Delay (d2), s/veh	0.0	0.3	0.0	0.0	4.8	9.7	1.9	0.0	3.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.7	0.1	0.0	0.0	8.5	9.0	5.8	0.0	5.3			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	3.8	0.3	0.0	0.0	39.2	44.2	40.5	0.0	42.2			
LnGrp LOS	A	A	A	A	D	D	D	A	D			
Approach Vol, veh/h	1612			1109			757					
Approach Delay, s/veh	1.4			40.9			41.1					
Approach LOS	A			D			D					
Timer - Assigned Phs	2			5			6			8		
Phs Duration (G+Y+Rc), s	74.5			46.0			28.5			20.5		
Change Period (Y+Rc), s	4.9			4.9			4.9			4.6		
Max Green Setting (Gmax), s	56.1			18.1			33.1			29.4		
Max Q Clear Time (g_c+I1), s	2.0			4.5			22.3			15.8		
Green Ext Time (p_c), s	1.6			0.1			1.3			0.1		

Intersection Summary

HCM 6th Ctrl Delay	22.6
HCM 6th LOS	C

Notes










User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

14: Stony Point Rd/Marlow Rd & W College Ave

Lance Drive Residential TIA
Near Term Plus Project AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	94	370	150	165	200	130	80	586	162	180	577	81
Future Volume (veh/h)	94	370	150	165	200	130	80	586	162	180	577	81
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	104	411	129	183	222	50	89	651	97	200	641	83
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	335	532	165	403	689	152	113	788	703	218	885	114
Arrive On Green	0.19	0.20	0.20	0.23	0.24	0.24	0.06	0.22	0.22	0.12	0.28	0.28
Sat Flow, veh/h	1767	2635	817	1767	2868	633	1767	3526	1538	1767	3131	405
Grp Volume(v), veh/h	104	273	267	183	135	137	89	651	97	200	360	364
Grp Sat Flow(s),veh/h/ln	1767	1763	1690	1767	1763	1738	1767	1763	1538	1767	1763	1773
Q Serve(g_s), s	4.8	13.9	14.2	8.5	6.0	6.2	4.7	16.7	1.6	10.6	17.5	17.6
Cycle Q Clear(g_c), s	4.8	13.9	14.2	8.5	6.0	6.2	4.7	16.7	1.6	10.6	17.5	17.6
Prop In Lane	1.00		0.48	1.00		0.36	1.00		1.00	1.00		0.23
Lane Grp Cap(c), veh/h	335	356	341	403	424	418	113	788	703	218	498	501
V/C Ratio(X)	0.31	0.77	0.78	0.45	0.32	0.33	0.79	0.83	0.14	0.92	0.72	0.73
Avail Cap(c_a), veh/h	335	482	462	403	508	501	136	891	748	218	527	530
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.52	0.52	0.52	1.00	1.00	1.00	0.60	0.60	0.60
Uniform Delay (d), s/veh	33.1	35.8	35.9	31.6	29.7	29.8	43.8	35.1	5.0	41.2	30.7	30.7
Incr Delay (d2), s/veh	0.5	5.1	6.0	0.4	0.2	0.2	21.9	5.8	0.1	27.8	2.8	2.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	6.2	6.2	3.5	2.5	2.5	2.7	7.5	0.7	6.1	7.4	7.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.7	41.0	42.0	32.0	29.9	30.0	65.8	40.9	5.1	69.0	33.5	33.6
LnGrp LOS	C	D	D	C	C	C	E	D	A	E	C	C
Approach Vol, veh/h	644				455		837				924	
Approach Delay, s/veh	40.2				30.8		39.4				41.2	
Approach LOS	D				C		D				D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	27.0	24.5	11.4	32.2	23.3	28.1	17.0	26.5				
Change Period (Y+Rc), s	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3				
Max Green Setting (Gmax), s	26.0	7.3	28.4	10.7	27.4	11.7	24.0					
Max Q Clear Time (g_c+I10), s	16.2	6.7	19.6	6.8	8.2	12.6	18.7					
Green Ext Time (p_c), s	0.1	2.2	0.0	2.8	0.1	1.3	0.0	2.1				

Intersection Summary

HCM 6th Ctrl Delay 38.8

HCM 6th LOS D









Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary 15: N Dutton Ave & W College Ave

Lance Drive Residential TIA
Near Term Plus Project AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	730	110	90	520	287	90	358	100	219	242	60
Future Volume (veh/h)	100	730	110	90	520	287	90	358	100	219	242	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	108	785	107	97	559	244	97	385	85	235	260	41
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	135	863	118	123	668	291	476	481	105	583	698	108
Arrive On Green	0.08	0.28	0.28	0.07	0.28	0.28	0.27	0.17	0.17	0.33	0.23	0.23
Sat Flow, veh/h	1767	3108	424	1767	2386	1039	1767	2864	625	1767	3048	474
Grp Volume(v), veh/h	108	445	447	97	413	390	97	235	235	235	149	152
Grp Sat Flow(s),veh/h/ln	1767	1763	1769	1767	1763	1662	1767	1763	1726	1767	1763	1759
Q Serve(g_s), s	5.7	23.2	23.2	5.1	20.9	21.0	4.0	12.2	12.4	9.8	6.8	6.9
Cycle Q Clear(g_c), s	5.7	23.2	23.2	5.1	20.9	21.0	4.0	12.2	12.4	9.8	6.8	6.9
Prop In Lane	1.00		0.24	1.00		0.63	1.00		0.36	1.00		0.27
Lane Grp Cap(c), veh/h	135	489	491	123	494	465	476	296	290	583	404	403
V/C Ratio(X)	0.80	0.91	0.91	0.79	0.84	0.84	0.20	0.79	0.81	0.40	0.37	0.38
Avail Cap(c_a), veh/h	167	570	572	167	570	537	476	410	402	583	577	576
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.66	0.66	0.66	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.1	33.2	33.2	43.5	32.2	32.2	26.8	37.9	38.0	24.6	30.8	30.9
Incr Delay (d2), s/veh	10.8	11.4	11.4	11.3	8.3	8.9	0.1	4.8	5.8	0.2	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	11.1	11.1	2.6	9.7	9.3	1.7	5.5	5.6	3.9	2.8	2.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.0	44.5	44.5	54.8	40.4	41.1	26.9	42.7	43.8	24.7	31.1	31.1
LnGrp LOS	D	D	D	D	D	D	C	D	D	C	C	C
Approach Vol, veh/h	1000			900			567			536		
Approach Delay, s/veh	45.5			42.3			40.5			28.3		
Approach LOS	D			D			D			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	30.3	28.6	25.6	10.3	30.5	34.4	19.9					
Change Period (Y+Rc), s	3.9	* 3.9	3.0	3.9	3.0	3.9	3.0	3.9				
Max Green Setting (Gmax), s	31.0	* 31	10.4	31.1	9.0	30.7	19.4	22.1				
Max Q Clear Time (g_c+11), s	25.2	6.0	8.9	7.7	23.0	11.8	14.4					
Green Ext Time (p_c), s	0.0	1.2	0.0	0.5	0.0	1.3	0.1	0.7				

Intersection Summary

HCM 6th Ctrl Delay 40.5
HCM 6th LOS D

Notes





User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection

Intersection Delay, s/veh 8.6

Intersection LOS A




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	8	72	0	20	32	59	0	8	55	96	2	3
Future Vol, veh/h	8	72	0	20	32	59	0	8	55	96	2	3
Peak Hour Factor	0.66	0.66	0.92	0.92	0.66	0.66	0.92	0.92	0.92	0.66	0.92	0.66
Heavy Vehicles, %	3	3	2	2	3	3	2	2	2	3	2	3
Mvmt Flow	12	109	0	22	48	89	0	9	60	145	2	5
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.6	8.4	7.7	9.1
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	10%	18%	95%
Vol Thru, %	13%	90%	29%	2%
Vol Right, %	87%	0%	53%	3%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	63	80	111	101
LT Vol	0	8	20	96
Through Vol	8	72	32	2
RT Vol	55	0	59	3
Lane Flow Rate	68	121	160	152
Geometry Grp	1	1	1	1
Degree of Util (X)	0.081	0.157	0.192	0.204
Departure Headway (Hd)	4.24	4.673	4.32	4.837
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	843	767	830	741
Service Time	2.276	2.705	2.349	2.87
HCM Lane V/C Ratio	0.081	0.158	0.193	0.205
HCM Control Delay	7.7	8.6	8.4	9.1
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.3	0.6	0.7	0.8




HCM 6th TWSC
17: Iroquois St & Project Driveway (1)

Lance Drive Residential TIA
Near Term Plus Project AM (95-120 Seconds)

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	7	2	72	86	1
Future Vol, veh/h	2	7	2	72	86	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	8	2	78	93	1
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	176	94	94	0	-	0
Stage 1	94	-	-	-	-	-
Stage 2	82	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	814	963	1500	-	-	-
Stage 1	930	-	-	-	-	-
Stage 2	941	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	813	963	1500	-	-	-
Mov Cap-2 Maneuver	813	-	-	-	-	-
Stage 1	929	-	-	-	-	-
Stage 2	941	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	8.9	0.2		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1500	-	925	-	-	
HCM Lane V/C Ratio	0.001	-	0.011	-	-	
HCM Control Delay (s)	7.4	0	8.9	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	




HCM 6th TWSC
18: Iroquois St & Project Driveway (2)

Lance Drive Residential TIA
Near Term Plus Project AM (95-120 Seconds)

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	8	3	72	93	0
Future Vol, veh/h	2	8	3	72	93	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	9	3	78	101	0
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	185	101	101	0	-	0
Stage 1	101	-	-	-	-	-
Stage 2	84	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	804	954	1491	-	-	-
Stage 1	923	-	-	-	-	-
Stage 2	939	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	802	954	1491	-	-	-
Mov Cap-2 Maneuver	802	-	-	-	-	-
Stage 1	921	-	-	-	-	-
Stage 2	939	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	9	0.3		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1491	-	919	-	-	
HCM Lane V/C Ratio	0.002	-	0.012	-	-	
HCM Control Delay (s)	7.4	0	9	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	




HCM 6th TWSC
19: Project Driveway (3) & Lance Dr

Lance Drive Residential TIA
Near Term Plus Project AM (95-120 Seconds)

Intersection						
Int Delay, s/veh	1.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	212	1	14	97	4	37
Future Vol, veh/h	212	1	14	97	4	37
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	230	1	15	105	4	40
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	231	0	366	231
Stage 1	-	-	-	-	231	-
Stage 2	-	-	-	-	135	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1337	-	634	808
Stage 1	-	-	-	-	807	-
Stage 2	-	-	-	-	891	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1337	-	626	808
Mov Cap-2 Maneuver	-	-	-	-	626	-
Stage 1	-	-	-	-	807	-
Stage 2	-	-	-	-	880	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		1		9.9	
HCM LOS					A	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	786	-	-	1337	-	
HCM Lane V/C Ratio	0.057	-	-	0.011	-	
HCM Control Delay (s)	9.9	-	-	7.7	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0.2	-	-	0	-	

HCM 6th TWSC
20: Guerneville Rd & Project Driveway (4)























Lance Drive Residential TIA
Near Term Plus Project AM (95-120 Seconds)

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	818	559	6	16	8
Future Vol, veh/h	3	818	559	6	16	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	889	608	7	17	9
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	615	0	-	0	1063	308
Stage 1	-	-	-	-	612	-
Stage 2	-	-	-	-	451	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	961	-	-	-	218	688
Stage 1	-	-	-	-	504	-
Stage 2	-	-	-	-	609	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	961	-	-	-	217	688
Mov Cap-2 Maneuver	-	-	-	-	217	-
Stage 1	-	-	-	-	501	-
Stage 2	-	-	-	-	609	-
Approach	EB	WB		SB		
HCM Control Delay, s	0	0		19.1		
HCM LOS				C		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	961	-	-	-	281	
HCM Lane V/C Ratio	0.003	-	-	-	0.093	
HCM Control Delay (s)	8.8	0	-	-	19.1	
HCM Lane LOS	A	A	-	-	C	
HCM 95th %tile Q(veh)	0	-	-	-	0.3	

HCM 6th Signalized Intersection Summary







1: Marlow Rd & Marlow Ct/W Steele Ln

Lance Drive Residential TIA
Near Term Plus Project AM (120 Seconds)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	10	10	220	10	190	10	521	220	144	500	10
Future Volume (veh/h)	10	10	10	220	10	190	10	521	220	144	500	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		1.00	1.00		0.96	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	12	12	2	265	0	131	12	606	163	167	581	12
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	29	29	5	1656	0	910	24	794	1076	199	1134	23
Arrive On Green	0.04	0.04	0.04	0.47	0.00	0.47	0.01	0.23	0.23	0.11	0.32	0.32
Sat Flow, veh/h	822	822	137	3534	0	1565	1767	3526	1505	1767	3532	73
Grp Volume(v), veh/h	26	0	0	265	0	131	12	606	163	167	290	303
Grp Sat Flow(s),veh/h/ln	1781	0	0	1767	0	1565	1767	1763	1505	1767	1763	1842
Q Serve(g_s), s	1.7	0.0	0.0	5.2	0.0	0.0	0.8	19.3	4.5	11.1	16.0	16.0
Cycle Q Clear(g_c), s	1.7	0.0	0.0	5.2	0.0	0.0	0.8	19.3	4.5	11.1	16.0	16.0
Prop In Lane	0.46		0.08	1.00		1.00	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	63	0	0	1656	0	910	24	794	1076	199	566	592
V/C Ratio(X)	0.41	0.00	0.00	0.16	0.00	0.14	0.49	0.76	0.15	0.84	0.51	0.51
Avail Cap(c_a), veh/h	224	0	0	1656	0	910	149	1040	1181	517	883	922
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.59	0.59	0.59	1.00	1.00	1.00
Uniform Delay (d), s/veh	56.6	0.0	0.0	18.3	0.0	11.5	58.8	43.5	6.3	52.2	33.1	33.1
Incr Delay (d2), s/veh	4.2	0.0	0.0	0.2	0.0	0.3	8.9	1.5	0.0	9.2	0.7	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	0.0	2.2	0.0	1.6	0.4	8.5	4.2	5.4	6.9	7.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.8	0.0	0.0	18.5	0.0	11.8	67.7	45.0	6.4	61.4	33.8	33.8
LnGrp LOS	E	A	A	B	A	B	E	D	A	E	C	C
Approach Vol, veh/h		26			396			781			760	
Approach Delay, s/veh		60.8			16.3			37.3			39.9	
Approach LOS		E			B			D			D	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		60.8	6.5	43.4		9.2	18.4	31.6				
Change Period (Y+Rc), s		4.6	4.9	4.9		4.9	4.9	4.6				
Max Green Setting (Gmax), s		15.4	10.1	60.1		15.1	35.1	35.4				
Max Q Clear Time (g_c+I1), s		7.2	2.8	18.0		3.7	13.1	21.3				
Green Ext Time (p_c), s		0.9	0.0	3.8		0.0	0.4	3.9				
Intersection Summary												
HCM 6th Ctrl Delay			34.4									
HCM 6th LOS			C									
Notes												
User approved pedestrian interval to be less than phase max green.												
User approved volume balancing among the lanes for turning movement.												






















HCM 6th TWSC
2: Iroquois St/Apple Valley Ln & W Steele Ln

Lance Drive Residential TIA
Near Term Plus Project AM (120 Seconds)

Intersection												
Int Delay, s/veh	6.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	30	370	54	23	310	20	61	10	43	20	10	40
Future Vol, veh/h	30	370	54	23	310	20	61	10	43	20	10	40
Conflicting Peds, #/hr	12	0	24	24	0	12	4	0	4	4	0	4
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	60	-	-	80	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	36	446	65	28	373	24	73	12	52	24	12	48
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	409	0	0	535	0	0	1050	1040	507	1040	1060	401
Stage 1	-	-	-	-	-	-	575	575	-	453	453	-
Stage 2	-	-	-	-	-	-	475	465	-	587	607	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1144	-	-	1028	-	-	204	229	564	207	223	647
Stage 1	-	-	-	-	-	-	502	501	-	584	568	-
Stage 2	-	-	-	-	-	-	569	561	-	494	485	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1131	-	-	1005	-	-	167	208	549	168	203	637
Mov Cap-2 Maneuver	-	-	-	-	-	-	167	208	-	168	203	-
Stage 1	-	-	-	-	-	-	475	474	-	559	546	-
Stage 2	-	-	-	-	-	-	498	539	-	421	459	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.5			0.6			40.8			21.4		
HCM LOS							E			C		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	232	1131	-	-	1005	-	-	303				
HCM Lane V/C Ratio	0.592	0.032	-	-	0.028	-	-	0.278				
HCM Control Delay (s)	40.8	8.3	-	-	8.7	-	-	21.4				
HCM Lane LOS	E	A	-	-	A	-	-	C				
HCM 95th %tile Q(veh)	3.4	0.1	-	-	0.1	-	-	1.1				

HCM 6th Signalized Intersection Summary 3: Range Ave & W Steele Ln

Lance Drive Residential TIA
Near Term Plus Project AM (120 Seconds)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	421	61	50	280	40	40	170	30	30	150	30
Future Volume (veh/h)	40	421	61	50	280	40	40	170	30	30	150	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.95	1.00		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	45	478	67	57	318	43	45	193	20	34	170	12
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	764	1204	169	617	1208	163	58	386	39	50	410	29
Arrive On Green	0.76	0.76	0.76	0.76	0.76	0.76	0.03	0.12	0.12	0.03	0.12	0.12
Sat Flow, veh/h	1011	1591	223	854	1597	216	1767	3211	328	1767	3328	232
Grp Volume(v), veh/h	45	0	545	57	0	361	45	105	108	34	89	93
Grp Sat Flow(s),veh/h/ln	1011	0	1814	854	0	1812	1767	1763	1776	1767	1763	1797
Q Serve(g_s), s	1.7	0.0	12.5	3.0	0.0	7.3	3.0	6.7	6.9	2.3	5.6	5.7
Cycle Q Clear(g_c), s	9.0	0.0	12.5	15.5	0.0	7.3	3.0	6.7	6.9	2.3	5.6	5.7
Prop In Lane	1.00		0.12	1.00		0.12	1.00		0.18	1.00		0.13
Lane Grp Cap(c), veh/h	764	0	1373	617	0	1371	58	212	213	50	217	222
V/C Ratio(X)	0.06	0.00	0.40	0.09	0.00	0.26	0.78	0.49	0.51	0.68	0.41	0.42
Avail Cap(c_a), veh/h	764	0	1373	617	0	1371	162	413	416	147	398	406
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.84	0.84	0.84	1.00	1.00	1.00
Uniform Delay (d), s/veh	5.8	0.0	5.1	7.8	0.0	4.4	57.6	49.4	49.5	57.8	48.6	48.6
Incr Delay (d2), s/veh	0.1	0.0	0.9	0.3	0.0	0.5	7.0	0.6	0.6	5.9	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	4.2	0.6	0.0	2.4	1.4	2.9	3.0	1.1	2.5	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	5.9	0.0	5.9	8.1	0.0	4.9	64.6	49.9	50.0	63.7	49.0	49.1
LnGrp LOS	A	A	A	A	A	A	E	D	D	E	D	D
Approach Vol, veh/h	590				418				258			
Approach Delay, s/veh	5.9				5.3				52.5			
Approach LOS	A				A				D			
Timer - Assigned Phs	2			3		4		6		7		8
Phs Duration (G+Y+Rc), s	94.4			6.9		18.7		94.4		7.3		18.3
Change Period (Y+Rc), s	3.6			3.0		3.9		3.6		3.9		* 3.9
Max Green Setting (Gmax), s	71.4			11.0		27.1		71.4		10.0		* 28
Max Q Clear Time (g_c+I1), s	14.5			5.0		7.7		17.5		4.3		8.9
Green Ext Time (p_c), s	1.2			0.0		0.3		0.9		0.0		0.3
Intersection Summary												
HCM 6th Ctrl Delay	20.5											
HCM 6th LOS	C											
Notes												

HCM 6th Signalized Intersection Summary

4: Marlow Rd & Guerneville Rd

Lance Drive Residential TIA
Near Term Plus Project AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	120	448	150	178	302	101	130	480	180	111	500	90
Future Volume (veh/h)	120	448	150	178	302	101	130	480	180	111	500	90
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	130	487	97	193	328	84	141	522	73	121	543	85
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	157	629	428	222	607	153	169	654	483	226	663	103
Arrive On Green	0.09	0.18	0.18	0.13	0.22	0.22	0.10	0.19	0.19	0.04	0.07	0.07
Sat Flow, veh/h	1767	3526	1557	1767	2783	702	1767	3526	1539	1767	3046	475
Grp Volume(v), veh/h	130	487	97	193	206	206	141	522	73	121	313	315
Grp Sat Flow(s),veh/h/ln	1767	1763	1557	1767	1763	1722	1767	1763	1539	1767	1763	1758
Q Serve(g_s), s	8.7	15.8	2.1	12.9	12.4	12.8	9.4	17.0	0.0	8.1	21.0	21.2
Cycle Q Clear(g_c), s	8.7	15.8	2.1	12.9	12.4	12.8	9.4	17.0	0.0	8.1	21.0	21.2
Prop In Lane	1.00		1.00	1.00		0.41	1.00		1.00	1.00		0.27
Lane Grp Cap(c), veh/h	157	629	428	222	385	376	169	654	483	226	384	383
V/C Ratio(X)	0.83	0.77	0.23	0.87	0.54	0.55	0.83	0.80	0.15	0.53	0.82	0.82
Avail Cap(c_a), veh/h	246	861	531	290	474	464	275	961	617	246	451	450
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	0.99	0.99	0.99	0.58	0.58	0.58	0.91	0.91	0.91
Uniform Delay (d), s/veh	53.8	47.0	6.3	51.5	41.5	41.7	53.3	46.7	29.9	54.0	53.3	53.4
Incr Delay (d2), s/veh	12.3	3.0	0.3	19.3	5.2	5.6	6.7	1.8	0.1	1.8	8.9	9.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.3	7.1	1.5	6.8	5.9	5.9	4.4	7.5	1.5	3.8	10.9	11.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	66.0	50.0	6.6	70.8	46.7	47.3	60.0	48.5	30.0	55.7	62.2	62.7
LnGrp LOS	E	D	A	E	D	D	E	D	C	E	E	E
Approach Vol, veh/h	714			605			736			749		
Approach Delay, s/veh	47.0			54.6			48.8			61.4		
Approach LOS	D			D			D			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	20.8	27.1	16.8	31.4	16.0	31.9	20.7	27.6				
Change Period (Y+Rc), s	5.7	* 5.7	5.3	5.3	5.3	5.7	5.3	5.3				
Max Green Setting (Gmax), s	29.3	* 29	18.7	30.7	16.7	32.3	16.7	32.7				
Max Q Clear Time (g_c+14.5), s	17.8	17.8	11.4	23.2	10.7	14.8	10.1	19.0				
Green Ext Time (p_c), s	0.2	2.6	0.2	2.2	0.1	2.1	0.1	2.9				

Intersection Summary

HCM 6th Ctrl Delay 53.0

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary

5: Ridley Ave & Guerneville Rd

Lance Drive Residential TIA
Near Term Plus Project AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	719	30	66	491	20	40	10	62	40	10	30
Future Volume (veh/h)	30	719	30	66	491	20	40	10	62	40	10	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	0.98		0.96	0.98		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	34	808	33	74	552	21	45	11	22	45	11	9
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	698	2914	119	577	2926	111	123	34	43	147	35	21
Arrive On Green	0.85	0.85	0.85	0.57	0.57	0.57	0.10	0.10	0.10	0.10	0.10	0.10
Sat Flow, veh/h	831	3448	141	648	3462	132	780	347	443	987	359	216
Grp Volume(v), veh/h	34	413	428	74	281	292	78	0	0	65	0	0
Grp Sat Flow(s), veh/h/ln	831	1763	1826	648	1763	1831	1570	0	0	1562	0	0
Q Serve(g_s), s	1.2	5.7	5.7	6.9	9.3	9.3	0.9	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	10.5	5.7	5.7	12.6	9.3	9.3	5.2	0.0	0.0	4.2	0.0	0.0
Prop In Lane	1.00		0.08	1.00		0.07	0.58		0.28	0.69		0.14
Lane Grp Cap(c), veh/h	698	1490	1543	577	1490	1547	200	0	0	203	0	0
V/C Ratio(X)	0.05	0.28	0.28	0.13	0.19	0.19	0.39	0.00	0.00	0.32	0.00	0.00
Avail Cap(c_a), veh/h	698	1490	1543	577	1490	1547	532	0	0	530	0	0
HCM Platoon Ratio	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.92	0.92	0.92	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	3.4	1.9	1.9	8.2	6.0	6.1	51.1	0.0	0.0	50.8	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.4	0.4	0.0	0.0	0.0	0.5	0.0	0.0	0.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	1.2	1.2	1.0	2.6	2.7	2.3	0.0	0.0	1.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	3.5	2.3	2.3	8.2	6.1	6.1	51.6	0.0	0.0	51.1	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	D	A	A	D	A	A
Approach Vol, veh/h	875			647			78			65		
Approach Delay, s/veh	2.3			6.3			51.6			51.1		
Approach LOS	A			A			D			D		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	105.3			14.7			105.3			14.7		
Change Period (Y+Rc), s	3.9			3.0			3.9			3.0		
Max Green Setting (Gmax), s	74.1			39.0			74.1			39.0		
Max Q Clear Time (g_c+I1), s	12.5			6.2			14.6			7.2		
Green Ext Time (p_c), s	1.7			0.2			1.3			0.2		

Intersection Summary

HCM 6th Ctrl Delay	8.1
HCM 6th LOS	A

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

6: Lance Dr & Guerneville Rd

Lance Drive Residential TIA
Near Term Plus Project AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	48	766	30	30	446	89	20	54	70	168	92	109
Future Volume (veh/h)	48	766	30	30	446	89	20	54	70	168	92	109
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	57	912	35	36	531	86	24	64	47	200	110	115
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	75	985	38	72	998	435	99	256	171	252	116	120
Arrive On Green	0.01	0.09	0.09	0.01	0.09	0.09	0.31	0.31	0.31	0.31	0.31	0.31
Sat Flow, veh/h	1767	3458	133	1767	3526	1536	209	834	557	677	378	392
Grp Volume(v), veh/h	57	465	482	36	531	86	135	0	0	425	0	0
Grp Sat Flow(s), veh/h/ln	1767	1763	1828	1767	1763	1536	1600	0	0	1447	0	0
Q Serve(g_s), s	3.9	31.4	31.4	2.4	17.2	6.2	0.0	0.0	0.0	27.6	0.0	0.0
Cycle Q Clear(g_c), s	3.9	31.4	31.4	2.4	17.2	6.2	7.0	0.0	0.0	34.6	0.0	0.0
Prop In Lane	1.00		0.07	1.00		1.00	0.18		0.35	0.47		0.27
Lane Grp Cap(c), veh/h	75	502	521	72	998	435	527	0	0	489	0	0
V/C Ratio(X)	0.76	0.93	0.93	0.50	0.53	0.20	0.26	0.00	0.00	0.87	0.00	0.00
Avail Cap(c_a), veh/h	143	804	833	158	1636	713	560	0	0	520	0	0
HCM Platoon Ratio	0.33	0.33	0.33	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.97	0.97	0.97	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	58.5	53.1	53.1	58.0	46.8	41.8	31.2	0.0	0.0	40.9	0.0	0.0
Incr Delay (d2), s/veh	5.7	8.1	7.9	1.9	2.0	1.0	0.1	0.0	0.0	13.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	16.0	16.5	1.1	8.4	2.5	3.0	0.0	0.0	14.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	64.3	61.2	61.0	59.9	48.8	42.8	31.3	0.0	0.0	54.3	0.0	0.0
LnGrp LOS	E	E	E	E	D	D	C	A	A	D	A	A
Approach Vol, veh/h	1004			653			135			425		
Approach Delay, s/veh	61.3			48.6			31.3			54.3		
Approach LOS	E			D			C			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	39.5			41.4	10.4	39.3		41.4				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		4.6				
Max Green Setting (Gmax), s	54.7			39.4	9.7	55.7		39.4				
Max Q Clear Time (g_c+14.4), s	33.4			36.6	5.9	19.2		9.0				
Green Ext Time (p_c), s	0.0	0.8		0.2	0.0	0.6		0.2				

Intersection Summary

HCM 6th Ctrl Delay 54.4

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

7: N Dutton Ave/Westberry Dr & Guerneville Rd

Lance Drive Residential TIA
Near Term Plus Project AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	939	145	250	492	10	103	10	380	20	10	10
Future Volume (veh/h)	10	939	145	250	492	10	103	10	380	20	10	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	12	1131	169	301	593	11	133	0	147	24	12	1
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	29	1161	173	1210	2529	47	190	0	639	51	26	2
Arrive On Green	0.02	0.38	0.38	0.71	1.00	1.00	0.05	0.00	0.05	0.04	0.04	0.04
Sat Flow, veh/h	1767	3069	457	3428	3539	66	3534	0	1564	1159	580	48
Grp Volume(v), veh/h	12	648	652	301	295	309	133	0	147	37	0	0
Grp Sat Flow(s), veh/h/ln	1767	1763	1763	1714	1763	1842	1767	0	1564	1787	0	0
Q Serve(g_s), s	0.8	43.4	43.8	3.8	0.0	0.0	4.4	0.0	0.0	2.4	0.0	0.0
Cycle Q Clear(g_c), s	0.8	43.4	43.8	3.8	0.0	0.0	4.4	0.0	0.0	2.4	0.0	0.0
Prop In Lane	1.00		0.26	1.00		0.04	1.00		1.00	0.65		0.03
Lane Grp Cap(c), veh/h	29	667	667	1210	1260	1316	190	0	639	79	0	0
V/C Ratio(X)	0.41	0.97	0.98	0.25	0.23	0.23	0.70	0.00	0.23	0.47	0.00	0.00
Avail Cap(c_a), veh/h	90	667	667	1210	1260	1316	265	0	672	378	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.84	0.84	0.84	0.94	0.94	0.94	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	58.4	36.7	36.8	12.0	0.0	0.0	55.8	0.0	23.3	56.0	0.0	0.0
Incr Delay (d2), s/veh	2.9	25.8	26.9	0.0	0.4	0.4	1.8	0.0	0.1	1.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	22.6	23.0	1.3	0.1	0.1	2.0	0.0	2.7	1.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.3	62.4	63.6	12.0	0.4	0.4	57.6	0.0	23.4	57.6	0.0	0.0
LnGrp LOS	E	E	E	B	A	A	E	A	C	E	A	A
Approach Vol, veh/h	1312			905			280			37		
Approach Delay, s/veh	63.0			4.3			39.6			57.6		
Approach LOS	E			A			D			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	47.6	50.7		9.9	7.3	91.1		11.8				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		5.3				
Max Green Setting (Gmax), s	45.4	45.4		25.4	6.1	59.0		9.0				
Max Q Clear Time (g_c+15), s	45.8	45.8		4.4	2.8	2.0		6.4				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	0.5		0.0				

Intersection Summary

HCM 6th Ctrl Delay 39.4

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 8: Herbert St/Coffey Ln & Guerneville Rd

Lance Drive Residential TIA
Near Term Plus Project AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	140	1169	30	20	562	40	20	20	20	80	10	160
Future Volume (veh/h)	140	1169	30	20	562	40	20	20	20	80	10	160
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		0.96	1.00		0.94	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	163	1359	34	23	653	44	23	23	6	93	12	39
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	186	1278	32	555	1913	129	49	49	13	145	19	305
Arrive On Green	0.21	0.73	0.73	0.63	1.00	1.00	0.06	0.06	0.06	0.09	0.09	0.09
Sat Flow, veh/h	1767	3509	88	1767	3341	225	780	780	204	1574	203	1510
Grp Volume(v), veh/h	163	682	711	23	344	353	52	0	0	105	0	39
Grp Sat Flow(s), veh/h/ln	1767	1763	1834	1767	1763	1803	1764	0	0	1777	0	1510
Q Serve(g_s), s	10.7	43.7	43.7	0.6	0.0	0.0	3.4	0.0	0.0	6.8	0.0	2.6
Cycle Q Clear(g_c), s	10.7	43.7	43.7	0.6	0.0	0.0	3.4	0.0	0.0	6.8	0.0	2.6
Prop In Lane	1.00		0.05	1.00		0.12	0.44		0.12	0.89		1.00
Lane Grp Cap(c), veh/h	186	642	668	555	1009	1032	110	0	0	163	0	305
V/C Ratio(X)	0.87	1.06	1.06	0.04	0.34	0.34	0.47	0.00	0.00	0.64	0.00	0.13
Avail Cap(c_a), veh/h	225	642	668	555	1009	1032	367	0	0	386	0	494
HCM Platoon Ratio	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.68	0.68	0.68	0.93	0.93	0.93	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	46.6	16.3	16.3	15.4	0.0	0.0	54.3	0.0	0.0	52.6	0.0	39.7
Incr Delay (d2), s/veh	17.2	47.3	47.5	0.0	0.9	0.8	1.2	0.0	0.0	1.6	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.0	14.2	14.8	0.2	0.2	0.2	1.6	0.0	0.0	3.1	0.0	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	63.7	63.6	63.8	15.4	0.9	0.8	55.5	0.0	0.0	54.2	0.0	39.7
LnGrp LOS	E	F	F	B	A	A	E	A	A	D	A	D
Approach Vol, veh/h	1556			720			52			144		
Approach Delay, s/veh	63.7			1.3			55.5			50.3		
Approach LOS	E			A			E			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	43.0	49.0		15.9	18.0	74.0		12.1				
Change Period (Y+Rc), s	5.3	5.3		4.9	5.3	5.3		4.6				
Max Green Setting (Gmax), s	43.7			26.1	15.3	33.5		25.0				
Max Q Clear Time (g_c+11.6)	45.7			8.8	12.7	2.0		5.4				
Green Ext Time (p_c), s	0.0	0.0		0.1	0.0	0.6		0.0				
Intersection Summary												
HCM 6th Ctrl Delay				44.6								
HCM 6th LOS				D								

HCM 6th Signalized Intersection Summary

9: Range Ave & Guerneville Rd

Lance Drive Residential TIA
Near Term Plus Project AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	150	797	152	70	441	10	131	90	80	41	100	110
Future Volume (veh/h)	150	797	152	70	441	10	131	90	80	41	100	110
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.96	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	160	848	0	74	469	0	81	177	8	44	106	8
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	248	894		94	587		131	260	12	103	192	14
Arrive On Green	0.28	0.51	0.00	0.05	0.17	0.00	0.07	0.07	0.07	0.02	0.02	0.02
Sat Flow, veh/h	1767	3618	0	1767	3618	0	1767	3517	158	1767	3312	247
Grp Volume(v), veh/h	160	848	0	74	469	0	81	93	92	44	56	58
Grp Sat Flow(s),veh/h/ln	1767	1763	0	1767	1763	0	1767	1856	1819	1767	1763	1796
Q Serve(g_s), s	9.5	27.4	0.0	5.0	15.3	0.0	5.3	5.9	5.9	3.0	3.8	3.9
Cycle Q Clear(g_c), s	9.5	27.4	0.0	5.0	15.3	0.0	5.3	5.9	5.9	3.0	3.8	3.9
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.09	1.00		0.14
Lane Grp Cap(c), veh/h	248	894		94	587		131	137	134	103	102	104
V/C Ratio(X)	0.65	0.95		0.79	0.80		0.62	0.68	0.69	0.43	0.54	0.56
Avail Cap(c_a), veh/h	437	1548		246	1166		227	238	233	216	216	220
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	0.76	0.76	0.00	0.97	0.97	0.00	1.00	1.00	1.00	0.82	0.82	0.82
Uniform Delay (d), s/veh	40.5	28.8	0.0	56.1	48.1	0.0	53.9	54.2	54.2	56.9	57.3	57.3
Incr Delay (d2), s/veh	0.8	4.0	0.0	5.2	10.6	0.0	1.8	2.2	2.3	0.9	1.4	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	8.4	0.0	2.3	7.5	0.0	2.4	2.8	2.8	1.3	1.7	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.3	32.8	0.0	61.4	58.7	0.0	55.7	56.3	56.5	57.7	58.7	58.8
LnGrp LOS	D	C		E	E		E	E	E	E	E	E
Approach Vol, veh/h	1008		A	543		A	266		158			
Approach Delay, s/veh	34.2			59.0			56.2		58.4			
Approach LOS	C			E			E		E			
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	1.7	35.7		12.3	22.1	25.3		13.5				
Change Period (Y+Rc), s	5.3	5.3		5.3	5.3	5.3		4.6				
Max Green Setting (Gmax), s	6.3	52.7		14.7	29.7	39.7		15.4				
Max Q Clear Time (g_c+11), s	29.4			5.9	11.5	17.3		7.9				
Green Ext Time (p_c), s	0.0	1.0		0.0	0.0	0.6		0.1				

Intersection Summary

HCM 6th Ctrl Delay 45.9

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

10: Guerneville Rd & Steele Wy

Lance Drive Residential TIA
Near Term Plus Project AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	846	52	60	480	10	31	10	60	391	20	10
Future Volume (veh/h)	30	846	52	60	480	10	31	10	60	391	20	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	34	961	39	68	545	10	23	28	6	460	0	5
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	816	2037	995	200	618	11	98	103	178	521	0	957
Arrive On Green	0.46	0.58	0.58	0.06	0.17	0.17	0.06	0.06	0.06	0.15	0.00	0.15
Sat Flow, veh/h	1767	3526	1571	3428	3540	65	1767	1856	1556	3534	0	1566
Grp Volume(v), veh/h	34	961	39	68	271	284	23	28	6	460	0	5
Grp Sat Flow(s), veh/h/ln	1767	1763	1571	1714	1763	1842	1767	1856	1556	1767	0	1566
Q Serve(g_s), s	1.3	19.0	1.1	2.3	18.0	18.0	1.5	1.7	0.4	15.3	0.0	0.0
Cycle Q Clear(g_c), s	1.3	19.0	1.1	2.3	18.0	18.0	1.5	1.7	0.4	15.3	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.04	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	816	2037	995	200	308	321	98	103	178	521	0	957
V/C Ratio(X)	0.04	0.47	0.04	0.34	0.88	0.88	0.23	0.27	0.03	0.88	0.00	0.01
Avail Cap(c_a), veh/h	816	2037	995	203	580	606	398	417	442	798	0	1080
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.88	0.88	0.88	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	17.7	14.7	8.3	54.3	48.3	48.3	54.2	54.3	47.3	50.1	0.0	9.2
Incr Delay (d2), s/veh	0.0	0.7	0.1	0.4	3.3	3.2	0.4	0.5	0.0	5.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	7.4	0.5	1.0	8.1	8.5	0.7	0.8	0.2	7.1	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.7	15.4	8.3	54.7	51.6	51.5	54.7	54.9	47.3	55.3	0.0	9.2
LnGrp LOS	B	B	A	D	D	D	D	D	D	E	A	A
Approach Vol, veh/h	1034			623			57			465		
Approach Delay, s/veh	15.2			51.9			54.0			54.8		
Approach LOS	B			D			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	1.9	74.2		22.6	60.3	25.8		11.3				
Change Period (Y+Rc), s	4.9	4.9		4.9	4.9	4.9		4.6				
Max Green Setting (Gmax), s	39.5			27.1	7.1	39.5		27.0				
Max Q Clear Time (g_c+14), s	21.0			17.3	3.3	20.0		3.7				
Green Ext Time (p_c), s	0.0	1.3		0.1	0.0	0.5		0.0				

Intersection Summary

HCM 6th Ctrl Delay 35.2

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

11: Cleveland Ave & Guerneville Rd

Lance Drive Residential TIA
Near Term Plus Project AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰ ↱	↑ ↑	↱	↰ ↱	↑ ↑	↱	↰	↑ ↑		↰	↱	
Traffic Volume (veh/h)	60	1237	40	180	850	190	30	90	150	230	70	40
Future Volume (veh/h)	60	1237	40	180	850	190	30	90	150	230	70	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	66	1359	41	198	934	109	33	99	58	253	77	28
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	273	1468	44	252	1003	437	658	815	443	355	130	47
Arrive On Green	0.08	0.29	0.29	0.07	0.28	0.28	0.37	0.37	0.37	0.10	0.10	0.10
Sat Flow, veh/h	3428	5049	152	3428	3526	1536	1767	2190	1189	3534	1291	470
Grp Volume(v), veh/h	66	909	491	198	934	109	33	78	79	253	0	105
Grp Sat Flow(s), veh/h/ln	1714	1689	1824	1714	1763	1536	1767	1763	1617	1767	0	1761
Q Serve(g_s), s	2.2	31.3	31.3	6.8	30.9	6.6	1.4	3.5	3.9	8.3	0.0	6.8
Cycle Q Clear(g_c), s	2.2	31.3	31.3	6.8	30.9	6.6	1.4	3.5	3.9	8.3	0.0	6.8
Prop In Lane	1.00		0.08	1.00		1.00	1.00		0.74	1.00		0.27
Lane Grp Cap(c), veh/h	273	982	530	252	1003	437	658	656	602	355	0	177
V/C Ratio(X)	0.24	0.93	0.93	0.79	0.93	0.25	0.05	0.12	0.13	0.71	0.00	0.59
Avail Cap(c_a), veh/h	273	1185	640	374	1413	616	658	656	602	857	0	427
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.76	0.76	0.76	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	51.8	41.3	41.3	54.7	41.8	33.1	24.1	24.7	24.9	52.3	0.0	51.6
Incr Delay (d2), s/veh	0.2	10.1	16.3	2.6	5.8	0.1	0.1	0.4	0.5	1.0	0.0	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	14.1	16.2	3.0	14.0	2.4	0.6	1.5	1.6	3.7	0.0	3.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.0	51.4	57.6	57.3	47.6	33.1	24.2	25.1	25.3	53.3	0.0	52.8
LnGrp LOS	D	D	E	E	D	C	C	C	C	D	A	D
Approach Vol, veh/h	1466			1241			190			358		
Approach Delay, s/veh	53.5			47.9			25.0			53.2		
Approach LOS	D			D			C			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	39.8			49.6	14.4	39.1		16.9				
Change Period (Y+Rc), s	4.9	4.9		4.9	4.9	4.9		4.9				
Max Green Setting (Gmax), s	42.1			16.1	7.1	48.1		29.1				
Max Q Clear Time (g_c+1/3g), s	33.3			5.9	4.2	32.9		10.3				
Green Ext Time (p_c), s	0.0	1.5		0.1	0.0	1.2		0.1				

Intersection Summary

HCM 6th Ctrl Delay 49.6

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 12: US 101 SB Ramps & Guerneville Rd

Lance Drive Residential TIA
Near Term Plus Project AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑					↑	↑	↑
Traffic Volume (veh/h)	0	1084	523	260	912	0	0	0	0	350	10	298
Future Volume (veh/h)	0	1084	523	260	912	0	0	0	0	350	10	298
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1856	1856	1856	1856	0				1856	1856	1856
Adj Flow Rate, veh/h	0	1218	178	292	1025	0				401	0	278
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89				0.89	0.89	0.89
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	1339	408	345	1431	0				1820	0	810
Arrive On Green	0.00	0.26	0.26	0.10	0.41	0.00				0.51	0.00	0.51
Sat Flow, veh/h	0	5233	1544	3428	3618	0				3534	0	1572
Grp Volume(v), veh/h	0	1218	178	292	1025	0				401	0	278
Grp Sat Flow(s),veh/h/ln	0	1689	1544	1714	1763	0				1767	0	1572
Q Serve(g_s), s	0.0	27.9	11.5	10.0	29.2	0.0				7.4	0.0	12.5
Cycle Q Clear(g_c), s	0.0	27.9	11.5	10.0	29.2	0.0				7.4	0.0	12.5
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1339	408	345	1431	0				1820	0	810
V/C Ratio(X)	0.00	0.91	0.44	0.85	0.72	0.00				0.22	0.00	0.34
Avail Cap(c_a), veh/h	0	2030	619	546	2118	0				1820	0	810
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.33	0.33	0.82	0.82	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	42.7	36.7	53.0	29.9	0.0				15.9	0.0	17.1
Incr Delay (d2), s/veh	0.0	1.1	0.1	3.2	0.2	0.0				0.3	0.0	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	11.6	4.3	4.4	12.1	0.0				2.9	0.0	4.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	43.9	36.8	56.3	30.1	0.0				16.2	0.0	18.3
LnGrp LOS	A	D	D	E	C	A				B	A	B
Approach Vol, veh/h		1396			1317						679	
Approach Delay, s/veh		43.0			35.9						17.1	
Approach LOS		D			D						B	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	7.0	36.6		66.4		53.6						
Change Period (Y+Rc), s	4.9	4.9		4.6		4.9						
Max Green Setting (Gmax), s	48.1			38.4		72.1						
Max Q Clear Time (g_c+11.2), s	29.9			14.5		31.2						
Green Ext Time (p_c), s	0.0	1.8		0.1		1.5						

Intersection Summary

HCM 6th Ctrl Delay	35.0
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 13: US 101 NB Ramps & Guerneville Rd/Steele Ln

Lance Drive Residential TIA
Near Term Plus Project AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↑↑			↑↑↑		↰	↰↱	↰			
Traffic Volume (veh/h)	433	1001	0	0	803	210	369	10	420	0	0	0
Future Volume (veh/h)	433	1001	0	0	803	210	369	10	420	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1856	1856	0	0	1856	1856	1856	1856	1856			
Adj Flow Rate, veh/h	487	1125	0	0	902	207	526	0	231			
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89			
Percent Heavy Veh, %	3	3	0	0	3	3	3	3	3			
Cap, veh/h	1623	2670	0	0	997	228	578	0	257			
Arrive On Green	0.95	1.00	0.00	0.00	0.24	0.24	0.16	0.00	0.16			
Sat Flow, veh/h	3428	3618	0	0	4266	936	3534	0	1572			
Grp Volume(v), veh/h	487	1125	0	0	742	367	526	0	231			
Grp Sat Flow(s),veh/h/ln	1714	1763	0	0	1689	1658	1767	0	1572			
Q Serve(g_s), s	1.3	0.0	0.0	0.0	25.6	25.8	17.5	0.0	17.3			
Cycle Q Clear(g_c), s	1.3	0.0	0.0	0.0	25.6	25.8	17.5	0.0	17.3			
Prop In Lane	1.00		0.00	0.00		0.56	1.00		1.00			
Lane Grp Cap(c), veh/h	1623	2670	0	0	821	403	578	0	257			
V/C Ratio(X)	0.30	0.42	0.00	0.00	0.90	0.91	0.91	0.00	0.90			
Avail Cap(c_a), veh/h	1623	2670	0	0	1185	582	1160	0	516			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.56	0.56	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	1.7	0.0	0.0	0.0	44.1	44.1	49.3	0.0	49.2			
Incr Delay (d2), s/veh	0.0	0.3	0.0	0.0	5.7	11.3	2.4	0.0	4.5			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.4	0.1	0.0	0.0	11.2	11.7	7.7	0.0	6.9			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	1.7	0.3	0.0	0.0	49.8	55.4	51.7	0.0	53.7			
LnGrp LOS	A	A	A	A	D	E	D	A	D			
Approach Vol, veh/h	1612			1109			757					
Approach Delay, s/veh	0.7			51.6			52.3					
Approach LOS	A			D			D					
Timer - Assigned Phs	2			5		6	8					
Phs Duration (G+Y+Rc), s	95.8			61.7		34.1	24.2					
Change Period (Y+Rc), s	4.9			4.9		4.9	4.6					
Max Green Setting (Gmax), s	71.1			24.1		42.1	39.4					
Max Q Clear Time (g_c+I1), s	2.0			3.3		27.8	19.5					
Green Ext Time (p_c), s	1.6			0.1		1.4	0.1					

Intersection Summary

HCM 6th Ctrl Delay	28.2
HCM 6th LOS	C

Notes










User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

14: Stony Point Rd/Marlow Rd & W College Ave

Lance Drive Residential TIA
Near Term Plus Project AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	94	370	150	165	200	130	80	586	162	180	577	81
Future Volume (veh/h)	94	370	150	165	200	130	80	586	162	180	577	81
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No				No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	104	411	129	183	222	50	89	651	97	200	641	83
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	451	491	152	516	641	141	112	759	790	229	881	114
Arrive On Green	0.25	0.19	0.19	0.29	0.22	0.22	0.06	0.22	0.22	0.13	0.28	0.28
Sat Flow, veh/h	1767	2635	817	1767	2868	633	1767	3526	1538	1767	3131	405
Grp Volume(v), veh/h	104	273	267	183	135	137	89	651	97	200	360	364
Grp Sat Flow(s),veh/h/ln	1767	1763	1689	1767	1763	1738	1767	1763	1538	1767	1763	1773
Q Serve(g_s), s	5.6	17.9	18.3	9.8	7.7	8.0	6.0	21.3	1.9	13.3	22.2	22.2
Cycle Q Clear(g_c), s	5.6	17.9	18.3	9.8	7.7	8.0	6.0	21.3	1.9	13.3	22.2	22.2
Prop In Lane	1.00		0.48	1.00		0.36	1.00		1.00	1.00		0.23
Lane Grp Cap(c), veh/h	451	329	315	516	394	388	112	759	790	229	496	499
V/C Ratio(X)	0.23	0.83	0.85	0.35	0.34	0.35	0.79	0.86	0.12	0.87	0.73	0.73
Avail Cap(c_a), veh/h	451	383	367	516	504	497	180	887	846	314	577	581
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.53	0.53	0.53	1.00	1.00	1.00	0.64	0.64	0.64
Uniform Delay (d), s/veh	35.4	47.0	47.2	33.6	39.2	39.3	55.4	45.3	5.3	51.2	38.9	39.0
Incr Delay (d2), s/veh	0.3	12.7	14.8	0.2	0.3	0.3	11.9	7.5	0.1	12.2	2.5	2.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	8.9	8.8	4.2	3.3	3.4	3.0	9.9	0.7	6.6	9.7	9.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.6	59.8	62.0	33.8	39.4	39.6	67.3	52.8	5.4	63.5	41.4	41.5
LnGrp LOS	D	E	E	C	D	D	E	D	A	E	D	D
Approach Vol, veh/h	644		455			837			924			
Approach Delay, s/veh	56.8		37.2			48.9			46.2			
Approach LOS	E		D			D			D			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	40.3	27.7	12.9	39.1	35.9	32.1	20.9	31.1				
Change Period (Y+Rc), s	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3				
Max Green Setting (Gmax), s	26.1	26.1	12.2	39.3	13.0	34.3	21.3	30.2				
Max Q Clear Time (g_c+I1), s	20.3	20.3	8.0	24.2	7.6	10.0	15.3	23.3				
Green Ext Time (p_c), s	0.3	1.5	0.1	3.7	0.1	1.4	0.3	2.5				

Intersection Summary

HCM 6th Ctrl Delay 47.9

HCM 6th LOS D

Notes









User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

15: N Dutton Ave & W College Ave

Lance Drive Residential TIA
Near Term Plus Project AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	730	110	90	520	287	90	358	100	219	242	60
Future Volume (veh/h)	100	730	110	90	520	287	90	358	100	219	242	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	108	785	107	97	559	244	97	385	85	235	260	41
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	132	854	116	120	657	286	563	456	99	663	658	102
Arrive On Green	0.07	0.27	0.27	0.07	0.28	0.28	0.32	0.16	0.16	0.38	0.22	0.22
Sat Flow, veh/h	1767	3108	424	1767	2386	1039	1767	2864	625	1767	3048	474
Grp Volume(v), veh/h	108	445	447	97	413	390	97	235	235	235	149	152
Grp Sat Flow(s),veh/h/ln	1767	1763	1769	1767	1763	1662	1767	1763	1726	1767	1763	1759
Q Serve(g_s), s	7.2	29.4	29.4	6.5	26.6	26.7	4.7	15.5	15.9	11.5	8.7	8.9
Cycle Q Clear(g_c), s	7.2	29.4	29.4	6.5	26.6	26.7	4.7	15.5	15.9	11.5	8.7	8.9
Prop In Lane	1.00		0.24	1.00		0.63	1.00		0.36	1.00		0.27
Lane Grp Cap(c), veh/h	132	484	486	120	486	458	563	281	275	663	381	380
V/C Ratio(X)	0.82	0.92	0.92	0.81	0.85	0.85	0.17	0.84	0.85	0.35	0.39	0.40
Avail Cap(c_a), veh/h	177	604	606	177	604	569	563	383	375	663	574	573
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.64	0.64	0.64	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.7	42.2	42.2	55.1	41.1	41.2	29.5	48.9	49.1	27.0	40.3	40.4
Incr Delay (d2), s/veh	9.8	10.7	10.7	9.5	7.8	8.5	0.1	8.6	10.3	0.1	0.2	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	14.0	14.1	3.2	12.4	11.8	2.0	7.4	7.6	4.8	3.7	3.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	64.5	53.0	53.0	64.7	49.0	49.6	29.5	57.5	59.4	27.1	40.5	40.6
LnGrp LOS	E	D	D	E	D	D	C	E	E	C	D	D
Approach Vol, veh/h	1000			900			567			536		
Approach Delay, s/veh	54.2			51.0			53.5			34.7		
Approach LOS	D			D			D			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	2.1	36.9	41.2	29.8	12.0	37.0	48.0	23.0				
Change Period (Y+Rc), s	3.9	* 3.9	3.0	3.9	3.0	3.9	3.0	3.9				
Max Green Setting (Gmax), s	2.0	* 41	14.0	39.1	12.0	41.1	27.0	26.1				
Max Q Clear Time (g_c+10), s	1.5	31.4	6.7	10.9	9.2	28.7	13.5	17.9				
Green Ext Time (p_c), s	0.0	1.6	0.0	0.5	0.0	1.6	0.1	0.7				

Intersection Summary

HCM 6th Ctrl Delay 49.6

HCM 6th LOS D

Notes





User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection

Intersection Delay, s/veh 8.6

Intersection LOS A




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	8	72	0	20	32	59	0	8	55	96	2	3
Future Vol, veh/h	8	72	0	20	32	59	0	8	55	96	2	3
Peak Hour Factor	0.66	0.66	0.92	0.92	0.66	0.66	0.92	0.92	0.92	0.66	0.92	0.66
Heavy Vehicles, %	3	3	2	2	3	3	2	2	2	3	2	3
Mvmt Flow	12	109	0	22	48	89	0	9	60	145	2	5
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.6	8.4	7.7	9.1
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	10%	18%	95%
Vol Thru, %	13%	90%	29%	2%
Vol Right, %	87%	0%	53%	3%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	63	80	111	101
LT Vol	0	8	20	96
Through Vol	8	72	32	2
RT Vol	55	0	59	3
Lane Flow Rate	68	121	160	152
Geometry Grp	1	1	1	1
Degree of Util (X)	0.081	0.157	0.192	0.204
Departure Headway (Hd)	4.24	4.673	4.32	4.837
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	843	767	830	741
Service Time	2.276	2.705	2.349	2.87
HCM Lane V/C Ratio	0.081	0.158	0.193	0.205
HCM Control Delay	7.7	8.6	8.4	9.1
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.3	0.6	0.7	0.8




HCM 6th TWSC
17: Iroquois St & Project Driveway (1)

Lance Drive Residential TIA
Near Term Plus Project AM (120 Seconds)

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	7	2	72	86	1
Future Vol, veh/h	2	7	2	72	86	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	8	2	78	93	1
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	176	94	94	0	-	0
Stage 1	94	-	-	-	-	-
Stage 2	82	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	814	963	1500	-	-	-
Stage 1	930	-	-	-	-	-
Stage 2	941	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	813	963	1500	-	-	-
Mov Cap-2 Maneuver	813	-	-	-	-	-
Stage 1	929	-	-	-	-	-
Stage 2	941	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	8.9	0.2		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1500	-	925	-	-	
HCM Lane V/C Ratio	0.001	-	0.011	-	-	
HCM Control Delay (s)	7.4	0	8.9	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	




HCM 6th TWSC
18: Iroquois St & Project Driveway (2)

Lance Drive Residential TIA
Near Term Plus Project AM (120 Seconds)

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	8	3	72	93	0
Future Vol, veh/h	2	8	3	72	93	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	9	3	78	101	0
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	185	101	101	0	-	0
Stage 1	101	-	-	-	-	-
Stage 2	84	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	804	954	1491	-	-	-
Stage 1	923	-	-	-	-	-
Stage 2	939	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	802	954	1491	-	-	-
Mov Cap-2 Maneuver	802	-	-	-	-	-
Stage 1	921	-	-	-	-	-
Stage 2	939	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	9	0.3		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1491	-	919	-	-	
HCM Lane V/C Ratio	0.002	-	0.012	-	-	
HCM Control Delay (s)	7.4	0	9	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	




HCM 6th TWSC
19: Project Driveway (3) & Lance Dr

Lance Drive Residential TIA
Near Term Plus Project AM (120 Seconds)

Intersection						
Int Delay, s/veh	1.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	212	1	14	97	4	37
Future Vol, veh/h	212	1	14	97	4	37
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	230	1	15	105	4	40
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	231	0	366	231
Stage 1	-	-	-	-	231	-
Stage 2	-	-	-	-	135	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1337	-	634	808
Stage 1	-	-	-	-	807	-
Stage 2	-	-	-	-	891	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1337	-	626	808
Mov Cap-2 Maneuver	-	-	-	-	626	-
Stage 1	-	-	-	-	807	-
Stage 2	-	-	-	-	880	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		1		9.9	
HCM LOS					A	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	786	-	-	1337	-	
HCM Lane V/C Ratio	0.057	-	-	0.011	-	
HCM Control Delay (s)	9.9	-	-	7.7	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0.2	-	-	0	-	

HCM 6th TWSC
20: Guerneville Rd & Project Driveway (4)

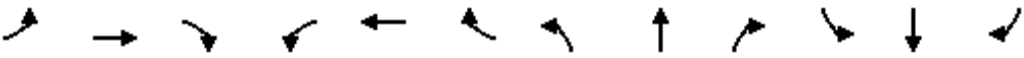
Lance Drive Residential TIA
Near Term Plus Project AM (120 Seconds)

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	818	559	6	16	8
Future Vol, veh/h	3	818	559	6	16	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	889	608	7	17	9
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	615	0	-	0	1063	308
Stage 1	-	-	-	-	612	-
Stage 2	-	-	-	-	451	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	961	-	-	-	218	688
Stage 1	-	-	-	-	504	-
Stage 2	-	-	-	-	609	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	961	-	-	-	217	688
Mov Cap-2 Maneuver	-	-	-	-	217	-
Stage 1	-	-	-	-	501	-
Stage 2	-	-	-	-	609	-
Approach	EB	WB		SB		
HCM Control Delay, s	0	0		19.1		
HCM LOS				C		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	961	-	-	-	281	
HCM Lane V/C Ratio	0.003	-	-	-	0.093	
HCM Control Delay (s)	8.8	0	-	-	19.1	
HCM Lane LOS	A	A	-	-	C	
HCM 95th %tile Q(veh)	0	-	-	-	0.3	

HCM 6th Signalized Intersection Summary







1: Marlow Rd & Marlow Ct/W Steele Ln

Lance Drive Residential TIA
Near Term Plus Project AM (120-140 Seconds)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔	↔	↔	↕	↔	↔	↕	
Traffic Volume (veh/h)	10	10	10	220	10	190	10	521	220	144	500	10
Future Volume (veh/h)	10	10	10	220	10	190	10	521	220	144	500	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.94	1.00		1.00	1.00		0.96	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	12	12	2	265	0	131	12	606	163	167	581	11
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	31	31	5	1784	0	962	24	750	1114	193	1085	21
Arrive On Green	0.04	0.04	0.04	0.50	0.00	0.50	0.01	0.21	0.21	0.11	0.31	0.31
Sat Flow, veh/h	822	822	137	3534	0	1566	1767	3526	1503	1767	3539	67
Grp Volume(v), veh/h	26	0	0	265	0	131	12	606	163	167	289	303
Grp Sat Flow(s),veh/h/ln	1780	0	0	1767	0	1566	1767	1763	1503	1767	1763	1843
Q Serve(g_s), s	2.0	0.0	0.0	5.6	0.0	0.0	0.9	22.9	4.8	13.0	19.1	19.1
Cycle Q Clear(g_c), s	2.0	0.0	0.0	5.6	0.0	0.0	0.9	22.9	4.8	13.0	19.1	19.1
Prop In Lane	0.46		0.08	1.00		1.00	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	67	0	0	1784	0	962	24	750	1114	193	541	565
V/C Ratio(X)	0.39	0.00	0.00	0.15	0.00	0.14	0.51	0.81	0.15	0.86	0.54	0.54
Avail Cap(c_a), veh/h	243	0	0	1784	0	962	77	992	1217	329	744	778
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.57	0.57	0.57	1.00	1.00	1.00
Uniform Delay (d), s/veh	65.8	0.0	0.0	18.6	0.0	11.4	68.6	52.4	6.3	61.3	40.3	40.3
Incr Delay (d2), s/veh	3.7	0.0	0.0	0.2	0.0	0.3	9.4	2.2	0.0	11.4	0.8	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	0.0	2.4	0.0	1.8	0.5	10.3	5.0	6.4	8.4	8.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	69.5	0.0	0.0	18.7	0.0	11.7	78.0	54.6	6.3	72.7	41.1	41.1
LnGrp LOS	E	A	A	B	A	B	E	D	A	E	D	D
Approach Vol, veh/h		26			396			781			759	
Approach Delay, s/veh		69.5			16.4			44.8			48.0	
Approach LOS		E			B			D			D	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		75.3	6.8	47.8		10.1	20.2	34.4				
Change Period (Y+Rc), s		4.6	4.9	4.9		4.9	4.9	4.6				
Max Green Setting (Gmax), s		36.4	6.1	59.1		19.1	26.1	39.4				
Max Q Clear Time (g_c+I1), s		7.6	2.9	21.1		4.0	15.0	24.9				
Green Ext Time (p_c), s		1.4	0.0	3.8		0.1	0.3	4.0				
Intersection Summary												
HCM 6th Ctrl Delay				40.7								
HCM 6th LOS				D								
Notes												
User approved pedestrian interval to be less than phase max green.												
User approved volume balancing among the lanes for turning movement.												






















HCM 6th TWSC
2: Iroquois St/Apple Valley Ln & W Steele Ln

Lance Drive Residential TIA
Near Term Plus Project AM (120-140 Seconds)

Intersection												
Int Delay, s/veh	6.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	30	370	54	23	310	20	61	10	43	20	10	40
Future Vol, veh/h	30	370	54	23	310	20	61	10	43	20	10	40
Conflicting Peds, #/hr	12	0	24	24	0	12	4	0	4	4	0	4
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	60	-	-	80	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	36	446	65	28	373	24	73	12	52	24	12	48
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	409	0	0	535	0	0	1050	1040	507	1040	1060	401
Stage 1	-	-	-	-	-	-	575	575	-	453	453	-
Stage 2	-	-	-	-	-	-	475	465	-	587	607	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1144	-	-	1028	-	-	204	229	564	207	223	647
Stage 1	-	-	-	-	-	-	502	501	-	584	568	-
Stage 2	-	-	-	-	-	-	569	561	-	494	485	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1131	-	-	1005	-	-	167	208	549	168	203	637
Mov Cap-2 Maneuver	-	-	-	-	-	-	167	208	-	168	203	-
Stage 1	-	-	-	-	-	-	475	474	-	559	546	-
Stage 2	-	-	-	-	-	-	498	539	-	421	459	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.5			0.6			40.8			21.4		
HCM LOS							E			C		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	232	1131	-	-	1005	-	-	303				
HCM Lane V/C Ratio	0.592	0.032	-	-	0.028	-	-	0.278				
HCM Control Delay (s)	40.8	8.3	-	-	8.7	-	-	21.4				
HCM Lane LOS	E	A	-	-	A	-	-	C				
HCM 95th %tile Q(veh)	3.4	0.1	-	-	0.1	-	-	1.1				

HCM 6th Signalized Intersection Summary 3: Range Ave & W Steele Ln

Lance Drive Residential TIA
Near Term Plus Project AM (120-140 Seconds)











												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	421	61	50	280	40	40	170	30	30	150	30
Future Volume (veh/h)	40	421	61	50	280	40	40	170	30	30	150	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.95	1.00		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	45	478	67	57	318	43	45	193	20	34	170	18
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	784	1241	174	637	1245	168	58	362	37	46	360	37
Arrive On Green	0.78	0.78	0.78	0.78	0.78	0.78	0.03	0.11	0.11	0.03	0.11	0.11
Sat Flow, veh/h	1011	1591	223	854	1597	216	1767	3210	328	1767	3199	333
Grp Volume(v), veh/h	45	0	545	57	0	361	45	105	108	34	92	96
Grp Sat Flow(s),veh/h/ln	1011	0	1814	854	0	1813	1767	1763	1775	1767	1763	1770
Q Serve(g_s), s	1.8	0.0	13.2	3.2	0.0	7.7	3.5	7.8	8.1	2.7	6.9	7.1
Cycle Q Clear(g_c), s	9.5	0.0	13.2	16.4	0.0	7.7	3.5	7.8	8.1	2.7	6.9	7.1
Prop In Lane	1.00		0.12	1.00		0.12	1.00		0.18	1.00		0.19
Lane Grp Cap(c), veh/h	784	0	1415	637	0	1413	58	199	200	46	198	199
V/C Ratio(X)	0.06	0.00	0.39	0.09	0.00	0.26	0.78	0.53	0.54	0.73	0.47	0.48
Avail Cap(c_a), veh/h	784	0	1415	637	0	1413	189	404	407	126	341	343
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.79	0.79	0.79	1.00	1.00	1.00
Uniform Delay (d), s/veh	5.5	0.0	4.9	7.4	0.0	4.2	67.2	58.6	58.7	67.7	58.2	58.3
Incr Delay (d2), s/veh	0.1	0.0	0.8	0.3	0.0	0.4	6.5	0.6	0.7	8.1	0.6	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	4.6	0.6	0.0	2.6	1.7	3.5	3.6	1.3	3.1	3.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	5.7	0.0	5.7	7.7	0.0	4.7	73.7	59.2	59.4	75.7	58.8	58.9
LnGrp LOS	A	A	A	A	A	A	E	E	E	E	E	E
Approach Vol, veh/h		590			418			258			222	
Approach Delay, s/veh		5.7			5.1			61.8			61.5	
Approach LOS		A			A			E			E	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		112.8	7.6	19.7		112.8	7.6	19.7				
Change Period (Y+Rc), s		3.6	3.0	3.9		3.6	3.9	* 3.9				
Max Green Setting (Gmax), s		87.4	15.0	27.1		87.4	10.0	* 32				
Max Q Clear Time (g_c+I1), s		15.2	5.5	9.1		18.4	4.7	10.1				
Green Ext Time (p_c), s		1.2	0.0	0.3		0.9	0.0	0.3				
Intersection Summary												
HCM 6th Ctrl Delay			23.6									
HCM 6th LOS			C									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

HCM 6th Signalized Intersection Summary

4: Marlow Rd & Guerneville Rd

Lance Drive Residential TIA
Near Term Plus Project AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	120	448	150	178	302	101	130	480	180	111	500	90
Future Volume (veh/h)	120	448	150	178	302	101	130	480	180	111	500	90
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	130	487	97	193	328	84	141	522	73	121	543	85
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	156	615	420	220	595	150	167	646	478	222	654	102
Arrive On Green	0.09	0.17	0.17	0.12	0.21	0.21	0.09	0.18	0.18	0.13	0.21	0.21
Sat Flow, veh/h	1767	3526	1556	1767	2783	702	1767	3526	1539	1767	3046	475
Grp Volume(v), veh/h	130	487	97	193	206	206	141	522	73	121	313	315
Grp Sat Flow(s),veh/h/ln	1767	1763	1556	1767	1763	1722	1767	1763	1539	1767	1763	1758
Q Serve(g_s), s	9.4	17.2	2.2	14.0	13.5	13.9	10.2	18.5	0.0	8.4	22.1	22.3
Cycle Q Clear(g_c), s	9.4	17.2	2.2	14.0	13.5	13.9	10.2	18.5	0.0	8.4	22.1	22.3
Prop In Lane	1.00		1.00	1.00		0.41	1.00		1.00	1.00		0.27
Lane Grp Cap(c), veh/h	156	615	420	220	377	368	167	646	478	222	379	378
V/C Ratio(X)	0.84	0.79	0.23	0.88	0.55	0.56	0.85	0.81	0.15	0.54	0.83	0.83
Avail Cap(c_a), veh/h	241	849	523	295	479	468	227	995	630	254	525	523
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.99	0.99	0.99	0.60	0.60	0.60	0.91	0.91	0.91
Uniform Delay (d), s/veh	58.3	51.4	6.5	55.9	45.5	45.6	57.9	50.9	32.7	53.3	48.7	48.8
Incr Delay (d2), s/veh	13.8	3.6	0.3	19.6	5.5	6.0	12.3	1.8	0.1	1.9	7.0	7.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.7	7.8	1.7	7.3	6.4	6.5	5.1	8.2	1.7	3.8	10.4	10.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	72.1	55.0	6.8	75.5	51.0	51.6	70.2	52.6	32.8	55.2	55.8	56.2
LnGrp LOS	E	D	A	E	D	D	E	D	C	E	E	E
Approach Vol, veh/h	714			605			736			749		
Approach Delay, s/veh	51.5			59.0			54.0			55.9		
Approach LOS	D			E			D			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	21.9	28.4	17.6	33.2	16.8	33.5	21.6	29.1				
Change Period (Y+Rc), s	5.7	* 5.7	5.3	5.3	5.3	5.7	5.3	5.3				
Max Green Setting (Gmax), s	21.9	* 31	16.7	38.7	17.7	35.3	18.7	36.7				
Max Q Clear Time (g_c+11.0), s	19.2	19.2	12.2	24.3	11.4	15.9	10.4	20.5				
Green Ext Time (p_c), s	0.2	2.6	0.1	3.2	0.1	2.2	0.2	3.2				

Intersection Summary

HCM 6th Ctrl Delay 55.0

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary

5: Ridley Ave & Guerneville Rd

Lance Drive Residential TIA
Near Term Plus Project AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	719	30	66	491	20	40	10	62	40	10	30
Future Volume (veh/h)	30	719	30	66	491	20	40	10	62	40	10	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	0.98		0.96	0.98		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No		No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	34	808	33	74	552	21	45	11	22	45	11	9
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	765	2958	121	580	2971	113	115	31	41	133	32	20
Arrive On Green	0.86	0.86	0.86	1.00	1.00	1.00	0.09	0.09	0.09	0.09	0.09	0.09
Sat Flow, veh/h	831	3448	141	648	3462	132	801	337	447	968	343	211
Grp Volume(v), veh/h	34	413	428	74	281	292	78	0	0	65	0	0
Grp Sat Flow(s), veh/h/ln	831	1763	1826	648	1763	1831	1585	0	0	1521	0	0
Q Serve(g_s), s	0.8	6.1	6.1	0.9	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.8	6.1	6.1	7.0	0.0	0.0	6.0	0.0	0.0	5.3	0.0	0.0
Prop In Lane	1.00		0.08	1.00		0.07	0.58		0.28	0.69		0.14
Lane Grp Cap(c), veh/h	765	1512	1567	580	1512	1571	187	0	0	185	0	0
V/C Ratio(X)	0.04	0.27	0.27	0.13	0.19	0.19	0.42	0.00	0.00	0.35	0.00	0.00
Avail Cap(c_a), veh/h	765	1512	1567	580	1512	1571	499	0	0	492	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.93	0.93	0.93	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	1.5	1.8	1.8	0.2	0.0	0.0	60.3	0.0	0.0	60.0	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.4	0.4	0.0	0.0	0.0	0.5	0.0	0.0	0.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln0.1	1.3	1.4	0.0	0.0	0.0	0.0	2.7	0.0	0.0	2.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	1.6	2.3	2.2	0.2	0.0	0.0	60.8	0.0	0.0	60.4	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	E	A	A	E	A	A
Approach Vol, veh/h	875				647		78				65	
Approach Delay, s/veh	2.2				0.0		60.8				60.4	
Approach LOS	A				A		E				E	
Timer - Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	124.0		16.0		124.0		16.0					
Change Period (Y+Rc), s	3.9		3.0		3.9		3.0					
Max Green Setting (Gmax), s	90.1		43.0		90.1		43.0					
Max Q Clear Time (g_c+I1), s	8.1		7.3		9.0		8.0					
Green Ext Time (p_c), s	1.7		0.2		1.3		0.2					

Intersection Summary

HCM 6th Ctrl Delay	6.4
HCM 6th LOS	A

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

6: Lance Dr & Guerneville Rd

Lance Drive Residential TIA
Near Term Plus Project AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	48	766	30	30	446	89	20	54	70	168	92	109
Future Volume (veh/h)	48	766	30	30	446	89	20	54	70	168	92	109
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	57	912	35	36	531	86	24	64	47	200	110	115
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	72	944	36	67	951	414	98	254	172	246	114	120
Arrive On Green	0.08	0.55	0.55	0.01	0.09	0.09	0.31	0.31	0.31	0.31	0.31	0.31
Sat Flow, veh/h	1767	3458	133	1767	3526	1536	218	819	554	670	369	385
Grp Volume(v), veh/h	57	465	482	36	531	86	135	0	0	425	0	0
Grp Sat Flow(s), veh/h/ln	1767	1763	1828	1767	1763	1536	1591	0	0	1424	0	0
Q Serve(g_s), s	4.4	35.5	35.5	2.8	20.2	7.3	0.0	0.0	0.0	33.0	0.0	0.0
Cycle Q Clear(g_c), s	4.4	35.5	35.5	2.8	20.2	7.3	8.1	0.0	0.0	41.2	0.0	0.0
Prop In Lane	1.00		0.07	1.00		1.00	0.18		0.35	0.47		0.27
Lane Grp Cap(c), veh/h	72	481	499	67	951	414	524	0	0	480	0	0
V/C Ratio(X)	0.79	0.97	0.97	0.54	0.56	0.21	0.26	0.00	0.00	0.89	0.00	0.00
Avail Cap(c_a), veh/h	135	852	884	135	1705	743	557	0	0	511	0	0
HCM Platoon Ratio	2.00	2.00	2.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.97	0.97	0.97	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	63.7	31.1	31.1	67.9	55.8	49.9	36.1	0.0	0.0	48.0	0.0	0.0
Incr Delay (d2), s/veh	6.9	10.3	10.1	2.4	2.3	1.1	0.1	0.0	0.0	15.5	0.0	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	2.0	12.2	12.6	1.3	9.9	3.0	3.6	0.0	0.0	16.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	70.5	41.5	41.2	70.4	58.1	51.0	36.2	0.0	0.0	63.5	0.0	0.0
LnGrp LOS	E	D	D	E	E	D	D	A	A	E	A	A
Approach Vol, veh/h	1004			653			135			425		
Approach Delay, s/veh	43.0			57.8			36.2			63.5		
Approach LOS	D			E			D			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	43.5			48.0	11.0	43.1		48.0				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		4.6				
Max Green Setting (Gmax), s	67.7			46.4	10.7	67.7		46.4				
Max Q Clear Time (g_c+14, s)	37.5			43.2	6.4	22.2		10.1				
Green Ext Time (p_c), s	0.0	0.8		0.3	0.0	0.6		0.2				

Intersection Summary

HCM 6th Ctrl Delay	50.9
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

7: N Dutton Ave/Westberry Dr & Guerneville Rd

Lance Drive Residential TIA
Near Term Plus Project AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	939	145	250	492	10	103	10	380	20	10	10
Future Volume (veh/h)	10	939	145	250	492	10	103	10	380	20	10	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.99	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	12	1131	169	301	593	11	133	0	147	24	12	1
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	28	1171	174	1301	2636	49	182	0	677	48	24	2
Arrive On Green	0.02	0.38	0.38	0.76	1.00	1.00	0.05	0.00	0.05	0.04	0.04	0.04
Sat Flow, veh/h	1767	3069	457	3428	3539	66	3534	0	1563	1159	580	48
Grp Volume(v), veh/h	12	648	652	301	295	309	133	0	147	37	0	0
Grp Sat Flow(s), veh/h/ln	1767	1763	1763	1714	1763	1842	1767	0	1563	1787	0	0
Q Serve(g_s), s	0.9	50.3	50.8	3.6	0.0	0.0	5.2	0.0	0.0	2.8	0.0	0.0
Cycle Q Clear(g_c), s	0.9	50.3	50.8	3.6	0.0	0.0	5.2	0.0	0.0	2.8	0.0	0.0
Prop In Lane	1.00		0.26	1.00		0.04	1.00		1.00	0.65		0.03
Lane Grp Cap(c), veh/h	28	672	673	1301	1313	1372	182	0	677	74	0	0
V/C Ratio(X)	0.42	0.96	0.97	0.23	0.22	0.23	0.73	0.00	0.22	0.50	0.00	0.00
Avail Cap(c_a), veh/h	77	698	698	1301	1313	1372	220	0	694	354	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.84	0.84	0.84	0.94	0.94	0.94	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	68.2	42.4	42.5	10.9	0.0	0.0	65.4	0.0	25.0	65.7	0.0	0.0
Incr Delay (d2), s/veh	3.1	24.2	25.2	0.0	0.4	0.4	7.0	0.0	0.1	2.0	0.0	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	0.4	25.8	26.2	1.3	0.1	0.1	2.5	0.0	3.1	1.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	71.4	66.5	67.7	10.9	0.4	0.4	72.4	0.0	25.1	67.7	0.0	0.0
LnGrp LOS	E	E	E	B	A	A	E	A	C	E	A	A
Approach Vol, veh/h	1312			905			280			37		
Approach Delay, s/veh	67.1			3.9			47.6			67.7		
Approach LOS	E			A			D			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	58.4	58.7		10.4	7.5	109.6		12.5				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		5.3				
Max Green Setting (Gmax), s	55.4	55.4		27.7	6.1	77.0		8.7				
Max Q Clear Time (g_c+1/5), s	52.8	52.8		4.8	2.9	2.0		7.2				
Green Ext Time (p_c), s	0.0	0.6		0.0	0.0	0.5		0.0				

Intersection Summary

HCM 6th Ctrl Delay 42.4

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 8: Herbert St/Coffey Ln & Guerneville Rd

Lance Drive Residential TIA
Near Term Plus Project AM (120-140 Seconds)











Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	140	1169	30	20	562	40	20	20	20	80	10	160
Future Volume (veh/h)	140	1169	30	20	562	40	20	20	20	80	10	160
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		0.96	1.00		0.93	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	163	1359	34	23	653	44	23	23	6	93	12	39
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	184	1358	34	570	2024	136	45	45	12	139	18	297
Arrive On Green	0.21	0.77	0.77	0.32	0.61	0.61	0.06	0.06	0.06	0.09	0.09	0.09
Sat Flow, veh/h	1767	3510	88	1767	3341	225	780	780	203	1574	203	1508
Grp Volume(v), veh/h	163	682	711	23	344	353	52	0	0	105	0	39
Grp Sat Flow(s), veh/h/ln	1767	1763	1835	1767	1763	1803	1763	0	0	1777	0	1508
Q Serve(g_s), s	12.5	54.1	54.2	1.3	13.4	13.4	4.0	0.0	0.0	8.0	0.0	3.0
Cycle Q Clear(g_c), s	12.5	54.1	54.2	1.3	13.4	13.4	4.0	0.0	0.0	8.0	0.0	3.0
Prop In Lane	1.00		0.05	1.00		0.12	0.44		0.12	0.89		1.00
Lane Grp Cap(c), veh/h	184	682	710	570	1068	1092	103	0	0	157	0	297
V/C Ratio(X)	0.89	1.00	1.00	0.04	0.32	0.32	0.51	0.00	0.00	0.67	0.00	0.13
Avail Cap(c_a), veh/h	263	786	818	570	1068	1092	316	0	0	334	0	447
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.70	0.70	0.70	0.94	0.94	0.94	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	54.7	15.8	15.8	32.5	13.5	13.5	64.0	0.0	0.0	61.8	0.0	46.9
Incr Delay (d2), s/veh	13.1	28.7	28.6	0.0	0.8	0.7	1.4	0.0	0.0	1.8	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.6	11.8	12.3	0.5	5.3	5.5	1.9	0.0	0.0	3.7	0.0	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	67.7	44.5	44.5	32.5	14.3	14.3	65.4	0.0	0.0	63.6	0.0	46.9
LnGrp LOS	E	D	F	C	B	B	E	A	A	E	A	D
Approach Vol, veh/h	1556			720			52			144		
Approach Delay, s/veh	46.9			14.8			65.4			59.1		
Approach LOS	D			B			E			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	49.0	61.0		17.3	19.8	90.1		12.7				
Change Period (Y+Rc), s	5.3	5.3		4.9	5.3	5.3		4.6				
Max Green Setting (Gmax), s	62.4	62.4		26.3	20.8	47.7		25.1				
Max Q Clear Time (g_c+I), s	13.3	56.2		10.0	14.5	15.4		6.0				
Green Ext Time (p_c), s	0.0	1.0		0.1	0.0	0.6		0.0				
Intersection Summary												
HCM 6th Ctrl Delay	38.7											
HCM 6th LOS	D											

HCM 6th Signalized Intersection Summary

9: Range Ave & Guerneville Rd

Lance Drive Residential TIA
Near Term Plus Project AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	150	797	152	70	441	10	131	90	80	41	100	110
Future Volume (veh/h)	150	797	152	70	441	10	131	90	80	41	100	110
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.96	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	160	848	0	74	469	0	81	177	8	44	106	8
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	258	915		94	587		159	316	14	103	192	14
Arrive On Green	0.15	0.26	0.00	0.05	0.17	0.00	0.09	0.09	0.09	0.06	0.06	0.06
Sat Flow, veh/h	1767	3618	0	1767	3618	0	1767	3518	158	1767	3312	247
Grp Volume(v), veh/h	160	848	0	74	469	0	81	93	92	44	56	58
Grp Sat Flow(s),veh/h/ln	1767	1763	0	1767	1763	0	1767	1856	1820	1767	1763	1796
Q Serve(g_s), s	10.2	28.1	0.0	5.0	15.3	0.0	5.2	5.8	5.8	2.9	3.7	3.8
Cycle Q Clear(g_c), s	10.2	28.1	0.0	5.0	15.3	0.0	5.2	5.8	5.8	2.9	3.7	3.8
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.09	1.00		0.14
Lane Grp Cap(c), veh/h	258	915		94	587		159	167	164	103	102	104
V/C Ratio(X)	0.62	0.93		0.79	0.80		0.51	0.56	0.56	0.43	0.54	0.56
Avail Cap(c_a), veh/h	275	1307		158	1072		492	516	507	161	160	163
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.79	0.79	0.00	0.98	0.98	0.00	1.00	1.00	1.00	0.80	0.80	0.80
Uniform Delay (d), s/veh	48.1	43.3	0.0	56.1	48.1	0.0	52.1	52.3	52.4	54.6	55.0	55.0
Incr Delay (d2), s/veh	2.0	5.9	0.0	5.3	10.7	0.0	0.9	1.1	1.1	0.8	1.3	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.6	12.7	0.0	2.3	7.5	0.0	2.4	2.7	2.7	1.3	1.7	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.1	49.2	0.0	61.4	58.8	0.0	53.0	53.4	53.5	55.4	56.3	56.4
LnGrp LOS	D	D		E	E		D	D	D	E	E	E
Approach Vol, veh/h	1008		A	543		A	266		158			
Approach Delay, s/veh	49.4			59.2			53.3		56.1			
Approach LOS	D			E			D		E			
Timer - Assigned Phs	1	2		4	5	6	8					
Phs Duration (G+Y+Rc), s	1.7	36.4		12.3	22.8	25.3	15.4					
Change Period (Y+Rc), s	5.3	5.3		5.3	5.3	5.3	4.6					
Max Green Setting (Gmax), s	44.5	44.5		10.9	18.7	36.5	33.4					
Max Q Clear Time (g_c+11), s	30.1	30.1		5.8	12.2	17.3	7.8					
Green Ext Time (p_c), s	0.0	1.0		0.0	0.0	0.6	0.1					

Intersection Summary

HCM 6th Ctrl Delay 53.1

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

10: Guerneville Rd & Steele Wy

Lance Drive Residential TIA
Near Term Plus Project AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	846	52	60	480	10	31	10	60	391	20	10
Future Volume (veh/h)	30	846	52	60	480	10	31	10	60	391	20	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	34	961	39	68	545	10	23	28	6	460	0	3
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	877	2176	1049	171	604	11	89	93	157	512	0	1007
Arrive On Green	0.50	0.62	0.62	0.05	0.17	0.17	0.05	0.05	0.05	0.14	0.00	0.14
Sat Flow, veh/h	1767	3526	1571	3428	3540	65	1767	1856	1554	3534	0	1566
Grp Volume(v), veh/h	34	961	39	68	271	284	23	28	6	460	0	3
Grp Sat Flow(s), veh/h/ln	1767	1763	1571	1714	1763	1842	1767	1856	1554	1767	0	1566
Q Serve(g_s), s	1.4	20.1	1.2	2.7	21.1	21.1	1.8	2.0	0.5	17.9	0.0	0.0
Cycle Q Clear(g_c), s	1.4	20.1	1.2	2.7	21.1	21.1	1.8	2.0	0.5	17.9	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.04	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	877	2176	1049	171	301	314	89	93	157	512	0	1007
V/C Ratio(X)	0.04	0.44	0.04	0.40	0.90	0.90	0.26	0.30	0.04	0.90	0.00	0.00
Avail Cap(c_a), veh/h	877	2176	1049	198	631	659	346	363	383	886	0	1173
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.88	0.88	0.88	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	18.1	14.1	7.9	64.5	56.9	56.9	64.0	64.1	56.9	58.9	0.0	9.0
Incr Delay (d2), s/veh	0.0	0.6	0.1	0.6	4.0	3.9	0.6	0.7	0.0	3.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	8.0	0.5	1.2	9.7	10.1	0.8	1.0	0.2	8.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.1	14.7	8.0	65.0	60.9	60.8	64.5	64.8	56.9	62.2	0.0	9.0
LnGrp LOS	B	B	A	E	E	E	E	E	E	E	A	A
Approach Vol, veh/h	1034			623			57			463		
Approach Delay, s/veh	14.5			61.3			63.8			61.9		
Approach LOS	B			E			E			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	1.9	91.3		25.2	74.4	28.8		11.6				
Change Period (Y+Rc), s	4.9	4.9		4.9	4.9	4.9		4.6				
Max Green Setting (Gmax), s	50.1			35.1	8.1	50.1		27.4				
Max Q Clear Time (g_c+14), s	22.1			19.9	3.4	23.1		4.0				
Green Ext Time (p_c), s	0.0	1.3		0.1	0.0	0.5		0.0				

Intersection Summary

HCM 6th Ctrl Delay 39.3

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

11: Cleveland Ave & Guerneville Rd

Lance Drive Residential TIA
Near Term Plus Project AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↑↑↓		↰↱	↑↑	↱	↰	↑↓		↰	↑↓	
Traffic Volume (veh/h)	60	1237	40	180	850	190	30	90	150	230	70	40
Future Volume (veh/h)	60	1237	40	180	850	190	30	90	150	230	70	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	66	1359	41	198	934	109	33	99	58	253	77	28
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	267	1456	44	244	994	433	713	884	480	342	125	45
Arrive On Green	0.08	0.29	0.29	0.07	0.28	0.28	0.40	0.40	0.40	0.10	0.10	0.10
Sat Flow, veh/h	3428	5049	152	3428	3526	1536	1767	2190	1190	3534	1291	469
Grp Volume(v), veh/h	66	909	491	198	934	109	33	78	79	253	0	105
Grp Sat Flow(s),veh/h/ln	1714	1689	1824	1714	1763	1536	1767	1763	1617	1767	0	1761
Q Serve(g_s), s	2.5	36.7	36.7	8.0	36.2	7.7	1.6	3.9	4.3	9.7	0.0	8.0
Cycle Q Clear(g_c), s	2.5	36.7	36.7	8.0	36.2	7.7	1.6	3.9	4.3	9.7	0.0	8.0
Prop In Lane	1.00		0.08	1.00		1.00	1.00		0.74	1.00		0.27
Lane Grp Cap(c), veh/h	267	974	526	244	994	433	713	711	652	342	0	171
V/C Ratio(X)	0.25	0.93	0.93	0.81	0.94	0.25	0.05	0.11	0.12	0.74	0.00	0.62
Avail Cap(c_a), veh/h	267	1257	679	394	1488	648	713	711	652	1088	0	542
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.75	0.75	0.75	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	60.7	48.5	48.5	64.1	49.1	38.8	25.4	26.1	26.2	61.5	0.0	60.7
Incr Delay (d2), s/veh	0.2	9.6	15.5	1.9	5.5	0.1	0.1	0.3	0.4	1.2	0.0	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	16.6	18.8	3.5	16.5	2.9	0.7	1.7	1.8	4.4	0.0	3.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.9	58.1	64.0	66.0	54.6	38.9	25.5	26.4	26.6	62.7	0.0	62.1
LnGrp LOS	E	E	E	E	D	D	C	C	C	E	A	E
Approach Vol, veh/h	1466			1241			190			358		
Approach Delay, s/veh	60.2			55.1			26.3			62.5		
Approach LOS	E			E			C			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.9	45.3		61.4	15.8	44.4		18.5				
Change Period (Y+Rc), s	4.9	4.9		4.9	4.9	4.9		4.9				
Max Green Setting (Gmax), s	52.1			9.1	9.1	59.1		43.1				
Max Q Clear Time (g_c+I10), s	38.7			6.3	4.5	38.2		11.7				
Green Ext Time (p_c), s	0.0	1.7		0.0	0.0	1.2		0.1				

Intersection Summary

HCM 6th Ctrl Delay 56.5

HCM 6th LOS E

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

12: US 101 SB Ramps & Guerneville Rd

Lance Drive Residential TIA
Near Term Plus Project AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑					↑	↑	↑
Traffic Volume (veh/h)	0	1084	523	260	912	0	0	0	0	350	10	298
Future Volume (veh/h)	0	1084	523	260	912	0	0	0	0	350	10	298
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1856	1856	1856	1856	0				1856	1856	1856
Adj Flow Rate, veh/h	0	1218	178	292	1025	0				401	0	278
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89				0.89	0.89	0.89
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	1322	403	338	1391	0				1900	0	845
Arrive On Green	0.00	0.26	0.26	0.10	0.39	0.00				0.54	0.00	0.54
Sat Flow, veh/h	0	5233	1544	3428	3618	0				3534	0	1572
Grp Volume(v), veh/h	0	1218	178	292	1025	0				401	0	278
Grp Sat Flow(s),veh/h/ln	0	1689	1544	1714	1763	0				1767	0	1572
Q Serve(g_s), s	0.0	32.7	13.5	11.8	34.7	0.0				8.3	0.0	13.9
Cycle Q Clear(g_c), s	0.0	32.7	13.5	11.8	34.7	0.0				8.3	0.0	13.9
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1322	403	338	1391	0				1900	0	845
V/C Ratio(X)	0.00	0.92	0.44	0.86	0.74	0.00				0.21	0.00	0.33
Avail Cap(c_a), veh/h	0	2066	630	566	2143	0				1900	0	845
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.34	0.34	0.83	0.83	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	50.3	43.2	62.2	36.2	0.0				16.9	0.0	18.2
Incr Delay (d2), s/veh	0.0	1.3	0.1	3.0	0.2	0.0				0.3	0.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	13.9	5.2	5.2	14.8	0.0				3.3	0.0	5.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	51.6	43.3	65.1	36.4	0.0				17.1	0.0	19.2
LnGrp LOS	A	D	D	E	D	A				B	A	B
Approach Vol, veh/h		1396			1317						679	
Approach Delay, s/veh		50.5			42.8						18.0	
Approach LOS		D			D						B	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	8.7	41.4		79.9		60.1						
Change Period (Y+Rc), s	4.9	4.9		4.6		4.9						
Max Green Setting (Gmax), s	28.5	57.1		45.4		85.1						
Max Q Clear Time (g_c+I1), s	13.8	34.7		15.9		36.7						
Green Ext Time (p_c), s	0.0	1.8		0.1		1.5						

Intersection Summary

HCM 6th Ctrl Delay	41.0
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 13: US 101 NB Ramps & Guerneville Rd/Steele Ln

Lance Drive Residential TIA
Near Term Plus Project AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↑↑			↑↑↑		↰	↰↱	↰			
Traffic Volume (veh/h)	433	1001	0	0	803	210	369	10	420	0	0	0
Future Volume (veh/h)	433	1001	0	0	803	210	369	10	420	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1856	1856	0	0	1856	1856	1856	1856	1856			
Adj Flow Rate, veh/h	487	1125	0	0	902	207	526	0	231			
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89			
Percent Heavy Veh, %	3	3	0	0	3	3	3	3	3			
Cap, veh/h	1699	2717	0	0	985	225	571	0	254			
Arrive On Green	0.99	1.00	0.00	0.00	0.24	0.24	0.16	0.00	0.16			
Sat Flow, veh/h	3428	3618	0	0	4266	936	3534	0	1572			
Grp Volume(v), veh/h	487	1125	0	0	742	367	526	0	231			
Grp Sat Flow(s),veh/h/ln	1714	1763	0	0	1689	1658	1767	0	1572			
Q Serve(g_s), s	0.3	0.0	0.0	0.0	30.0	30.2	20.5	0.0	20.2			
Cycle Q Clear(g_c), s	0.3	0.0	0.0	0.0	30.0	30.2	20.5	0.0	20.2			
Prop In Lane	1.00		0.00	0.00		0.56	1.00		1.00			
Lane Grp Cap(c), veh/h	1699	2717	0	0	811	398	571	0	254			
V/C Ratio(X)	0.29	0.41	0.00	0.00	0.92	0.92	0.92	0.00	0.91			
Avail Cap(c_a), veh/h	1699	2717	0	0	1209	593	1171	0	521			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.55	0.55	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	0.3	0.0	0.0	0.0	51.8	51.9	57.8	0.0	57.7			
Incr Delay (d2), s/veh	0.0	0.3	0.0	0.0	6.0	11.8	2.8	0.0	5.1			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	0.1	0.1	0.0	0.0	13.3	13.7	9.2	0.0	8.2			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.3	0.3	0.0	0.0	57.8	63.6	60.6	0.0	62.8			
LnGrp LOS	A	A	A	A	E	E	E	A	E			
Approach Vol, veh/h	1612			1109			757					
Approach Delay, s/veh	0.3			59.7			61.2					
Approach LOS	A			E			E					
Timer - Assigned Phs	2			5			6			8		
Phs Duration (G+Y+Rc), s	112.8			74.3			38.5			27.2		
Change Period (Y+Rc), s	4.9			4.9			4.9			4.6		
Max Green Setting (Gmax), s	84.1			29.1			50.1			46.4		
Max Q Clear Time (g_c+I1), s	2.0			2.3			32.2			22.5		
Green Ext Time (p_c), s	1.6			0.1			1.4			0.1		

Intersection Summary

HCM 6th Ctrl Delay	32.5
HCM 6th LOS	C

Notes










User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

14: Stony Point Rd/Marlow Rd & W College Ave

Lance Drive Residential TIA
Near Term Plus Project AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	94	370	150	165	200	130	80	586	162	180	577	81
Future Volume (veh/h)	94	370	150	165	200	130	80	586	162	180	577	81
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	104	411	129	183	222	50	89	651	97	200	641	81
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	508	478	148	571	622	137	110	764	841	225	885	112
Arrive On Green	0.29	0.18	0.18	0.32	0.22	0.22	0.06	0.22	0.22	0.13	0.28	0.28
Sat Flow, veh/h	1767	2635	817	1767	2868	633	1767	3526	1538	1767	3141	396
Grp Volume(v), veh/h	104	273	267	183	135	137	89	651	97	200	359	363
Grp Sat Flow(s),veh/h/ln	1767	1763	1689	1767	1763	1737	1767	1763	1538	1767	1763	1774
Q Serve(g_s), s	6.2	21.0	21.5	10.9	9.1	9.4	7.0	24.8	2.1	15.6	25.7	25.8
Cycle Q Clear(g_c), s	6.2	21.0	21.5	10.9	9.1	9.4	7.0	24.8	2.1	15.6	25.7	25.8
Prop In Lane	1.00		0.48	1.00		0.36	1.00		1.00	1.00		0.22
Lane Grp Cap(c), veh/h	508	320	306	571	382	377	110	764	841	225	497	500
V/C Ratio(X)	0.20	0.86	0.87	0.32	0.35	0.36	0.81	0.85	0.12	0.89	0.72	0.73
Avail Cap(c_a), veh/h	508	387	370	571	512	505	173	975	933	299	613	617
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.53	0.53	0.53	1.00	1.00	1.00	0.66	0.66	0.66
Uniform Delay (d), s/veh	37.8	55.5	55.7	35.8	46.5	46.6	64.8	52.7	5.6	60.1	45.3	45.4
Incr Delay (d2), s/veh	0.2	14.7	17.1	0.2	0.3	0.3	14.0	6.0	0.1	15.4	2.2	2.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	10.5	10.5	4.7	4.0	4.1	3.5	11.5	0.8	7.9	11.4	11.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.0	70.2	72.8	36.0	46.8	46.9	78.8	58.6	5.7	75.5	47.5	47.6
LnGrp LOS	D	E	E	D	D	D	E	E	A	E	D	D
Approach Vol, veh/h	644			455			837			922		
Approach Delay, s/veh	66.1			42.5			54.6			53.6		
Approach LOS	E			D			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	50.5	30.7	14.0	44.8	45.6	35.7	23.1	35.6				
Change Period (Y+Rc), s	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3				
Max Green Setting (Gmax), s	25.3	30.7	13.7	48.7	15.7	40.7	23.7	38.7				
Max Q Clear Time (g_c+11.2, s)	23.5	23.5	9.0	27.8	8.2	11.4	17.6	26.8				
Green Ext Time (p_c), s	0.4	1.8	0.1	4.2	0.1	1.5	0.3	3.5				

Intersection Summary

HCM 6th Ctrl Delay 54.9

HCM 6th LOS D

Notes









User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

15: N Dutton Ave & W College Ave

Lance Drive Residential TIA
Near Term Plus Project AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	730	110	90	520	287	90	358	100	219	242	60
Future Volume (veh/h)	100	730	110	90	520	287	90	358	100	219	242	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	108	785	107	97	559	244	97	385	85	235	260	41
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	130	847	115	118	650	283	614	442	97	709	635	99
Arrive On Green	0.07	0.27	0.27	0.07	0.27	0.27	0.35	0.15	0.15	0.40	0.21	0.21
Sat Flow, veh/h	1767	3108	424	1767	2386	1039	1767	2864	625	1767	3048	474
Grp Volume(v), veh/h	108	445	447	97	413	390	97	235	235	235	149	152
Grp Sat Flow(s),veh/h/ln	1767	1763	1769	1767	1763	1662	1767	1763	1726	1767	1763	1759
Q Serve(g_s), s	8.4	34.4	34.4	7.6	31.1	31.3	5.3	18.2	18.6	12.9	10.2	10.5
Cycle Q Clear(g_c), s	8.4	34.4	34.4	7.6	31.1	31.3	5.3	18.2	18.6	12.9	10.2	10.5
Prop In Lane	1.00		0.24	1.00		0.63	1.00		0.36	1.00		0.27
Lane Grp Cap(c), veh/h	130	480	482	118	480	453	614	272	267	709	367	366
V/C Ratio(X)	0.83	0.93	0.93	0.82	0.86	0.86	0.16	0.86	0.88	0.33	0.41	0.42
Avail Cap(c_a), veh/h	189	618	620	252	681	642	614	530	519	709	568	567
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.63	0.63	0.63	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	64.0	49.6	49.6	64.5	48.4	48.4	31.6	57.8	57.9	29.0	47.9	48.0
Incr Delay (d2), s/veh	8.1	10.9	10.9	5.2	5.8	6.3	0.0	3.2	3.7	0.1	0.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	16.5	16.5	3.6	14.3	13.6	2.3	8.3	8.4	5.4	4.5	4.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	72.1	60.5	60.5	69.6	54.2	54.7	31.6	60.9	61.6	29.1	48.2	48.3
LnGrp LOS	E	E	E	E	D	D	C	E	E	C	D	D
Approach Vol, veh/h	1000			900			567			536		
Approach Delay, s/veh	61.7			56.1			56.2			39.8		
Approach LOS	E			E			E			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	3.3	42.0	51.6	33.1	13.3	42.0	59.2	25.5				
Change Period (Y+Rc), s	3.9	* 3.9	3.0	3.9	3.0	3.9	3.0	3.9				
Max Green Setting (Gmax), s	40.0	* 49	12.0	45.1	15.0	54.1	15.0	42.1				
Max Q Clear Time (g_c+19.6)	19.6	36.4	7.3	12.5	10.4	33.3	14.9	20.6				
Green Ext Time (p_c), s	0.0	1.7	0.0	0.5	0.0	1.7	0.0	0.9				

Intersection Summary

HCM 6th Ctrl Delay 55.1

HCM 6th LOS E

Notes





User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection

Intersection Delay, s/veh 8.6

Intersection LOS A




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	8	72	0	20	32	59	0	8	55	96	2	3
Future Vol, veh/h	8	72	0	20	32	59	0	8	55	96	2	3
Peak Hour Factor	0.66	0.66	0.92	0.92	0.66	0.66	0.92	0.92	0.92	0.66	0.92	0.66
Heavy Vehicles, %	3	3	2	2	3	3	2	2	2	3	2	3
Mvmt Flow	12	109	0	22	48	89	0	9	60	145	2	5
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.6	8.4	7.7	9.1
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	10%	18%	95%
Vol Thru, %	13%	90%	29%	2%
Vol Right, %	87%	0%	53%	3%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	63	80	111	101
LT Vol	0	8	20	96
Through Vol	8	72	32	2
RT Vol	55	0	59	3
Lane Flow Rate	68	121	160	152
Geometry Grp	1	1	1	1
Degree of Util (X)	0.081	0.157	0.192	0.204
Departure Headway (Hd)	4.24	4.673	4.32	4.837
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	843	767	830	741
Service Time	2.276	2.705	2.349	2.87
HCM Lane V/C Ratio	0.081	0.158	0.193	0.205
HCM Control Delay	7.7	8.6	8.4	9.1
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.3	0.6	0.7	0.8




HCM 6th TWSC
17: Iroquois St & Project Driveway (1)

Lance Drive Residential TIA
Near Term Plus Project AM (120-140 Seconds)

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	7	2	72	86	1
Future Vol, veh/h	2	7	2	72	86	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	8	2	78	93	1
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	176	94	94	0	-	0
Stage 1	94	-	-	-	-	-
Stage 2	82	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	814	963	1500	-	-	-
Stage 1	930	-	-	-	-	-
Stage 2	941	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	813	963	1500	-	-	-
Mov Cap-2 Maneuver	813	-	-	-	-	-
Stage 1	929	-	-	-	-	-
Stage 2	941	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	8.9	0.2		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1500	-	925	-	-	
HCM Lane V/C Ratio	0.001	-	0.011	-	-	
HCM Control Delay (s)	7.4	0	8.9	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	




HCM 6th TWSC
18: Iroquois St & Project Driveway (2)

Lance Drive Residential TIA
Near Term Plus Project AM (120-140 Seconds)

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	8	3	72	93	0
Future Vol, veh/h	2	8	3	72	93	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	9	3	78	101	0
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	185	101	101	0	-	0
Stage 1	101	-	-	-	-	-
Stage 2	84	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	804	954	1491	-	-	-
Stage 1	923	-	-	-	-	-
Stage 2	939	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	802	954	1491	-	-	-
Mov Cap-2 Maneuver	802	-	-	-	-	-
Stage 1	921	-	-	-	-	-
Stage 2	939	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	9	0.3		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1491	-	919	-	-	
HCM Lane V/C Ratio	0.002	-	0.012	-	-	
HCM Control Delay (s)	7.4	0	9	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	




HCM 6th TWSC
19: Project Driveway (3) & Lance Dr

Lance Drive Residential TIA
Near Term Plus Project AM (120-140 Seconds)

Intersection						
Int Delay, s/veh	1.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	212	1	14	97	4	37
Future Vol, veh/h	212	1	14	97	4	37
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	230	1	15	105	4	40
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	231	0	366	231
Stage 1	-	-	-	-	231	-
Stage 2	-	-	-	-	135	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1337	-	634	808
Stage 1	-	-	-	-	807	-
Stage 2	-	-	-	-	891	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1337	-	626	808
Mov Cap-2 Maneuver	-	-	-	-	626	-
Stage 1	-	-	-	-	807	-
Stage 2	-	-	-	-	880	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	1		9.9		
HCM LOS	A					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	786	-	-	1337	-	
HCM Lane V/C Ratio	0.057	-	-	0.011	-	
HCM Control Delay (s)	9.9	-	-	7.7	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0.2	-	-	0	-	

HCM 6th TWSC
20: Guerneville Rd & Project Driveway (4)























Lance Drive Residential TIA
Near Term Plus Project AM (120-140 Seconds)

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	818	559	6	16	8
Future Vol, veh/h	3	818	559	6	16	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	889	608	7	17	9
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	615	0	-	0	1063	308
Stage 1	-	-	-	-	612	-
Stage 2	-	-	-	-	451	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	961	-	-	-	218	688
Stage 1	-	-	-	-	504	-
Stage 2	-	-	-	-	609	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	961	-	-	-	217	688
Mov Cap-2 Maneuver	-	-	-	-	217	-
Stage 1	-	-	-	-	501	-
Stage 2	-	-	-	-	609	-
Approach	EB	WB		SB		
HCM Control Delay, s	0	0		19.1		
HCM LOS				C		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	961	-	-	-	281	
HCM Lane V/C Ratio	0.003	-	-	-	0.093	
HCM Control Delay (s)	8.8	0	-	-	19.1	
HCM Lane LOS	A	A	-	-	C	
HCM 95th %tile Q(veh)	0	-	-	-	0.3	

HCM 6th Signalized Intersection Summary







1: Marlow Rd & Marlow Ct/W Steele Ln

Lance Drive Residential TIA
Near Term Plus Project PM (95-120 Seconds)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	0	10	170	10	158	10	651	170	132	741	10
Future Volume (veh/h)	10	0	10	170	10	158	10	651	170	132	741	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.96	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	11	0	0	187	0	97	11	685	118	139	780	11
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	66	0	0	1827	0	910	23	739	1130	112	926	13
Arrive On Green	0.04	0.00	0.00	0.52	0.00	0.52	0.01	0.21	0.21	0.06	0.26	0.26
Sat Flow, veh/h	1767	0	0	3534	0	1568	1767	3526	1514	1767	3558	50
Grp Volume(v), veh/h	11	0	0	187	0	97	11	685	118	139	386	405
Grp Sat Flow(s),veh/h/ln	1767	0	0	1767	0	1568	1767	1763	1514	1767	1763	1845
Q Serve(g_s), s	0.7	0.0	0.0	3.0	0.0	0.0	0.7	21.0	2.5	7.0	22.8	22.9
Cycle Q Clear(g_c), s	0.7	0.0	0.0	3.0	0.0	0.0	0.7	21.0	2.5	7.0	22.8	22.9
Prop In Lane	1.00		0.00	1.00		1.00	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	66	0	0	1827	0	910	23	739	1130	112	459	480
V/C Ratio(X)	0.17	0.00	0.00	0.10	0.00	0.11	0.48	0.93	0.10	1.24	0.84	0.84
Avail Cap(c_a), veh/h	482	0	0	1827	0	910	80	740	1131	112	459	480
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.62	0.62	0.62	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.3	0.0	0.0	13.6	0.0	10.3	53.9	42.7	4.5	51.5	38.6	38.6
Incr Delay (d2), s/veh	1.2	0.0	0.0	0.1	0.0	0.2	9.3	12.4	0.0	161.4	13.3	12.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.0	1.2	0.0	1.1	0.4	10.2	2.7	8.1	11.3	11.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.5	0.0	0.0	13.7	0.0	10.6	63.2	55.0	4.5	212.9	51.9	51.4
LnGrp LOS	D	A	A	B	A	B	E	E	A	F	D	D
Approach Vol, veh/h		11			284			814			930	
Approach Delay, s/veh		52.5			12.6			47.8			75.7	
Approach LOS		D			B			D			E	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		61.5	6.3	33.5		8.7	11.9	27.9				
Change Period (Y+Rc), s		4.6	4.9	4.9		4.6	4.9	4.9				
Max Green Setting (Gmax), s		30.9	5.0	25.1		30.0	7.0	23.1				
Max Q Clear Time (g_c+I1), s		5.0	2.7	24.9		2.7	9.0	23.0				
Green Ext Time (p_c), s		1.0	0.0	0.1		0.0	0.0	0.1				
Intersection Summary												
HCM 6th Ctrl Delay				55.7								
HCM 6th LOS				E								
Notes												
User approved pedestrian interval to be less than phase max green.												
User approved volume balancing among the lanes for turning movement.												

HCM 6th TWSC
2: Iroquois St/Apple Valley Ln & W Steele Ln






















Lance Drive Residential TIA
Near Term Plus Project PM (95-120 Seconds)

Intersection												
Int Delay, s/veh	4.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	30	300	54	55	460	40	49	10	29	30	10	30
Future Vol, veh/h	30	300	54	55	460	40	49	10	29	30	10	30
Conflicting Peds, #/hr	9	0	9	9	0	9	1	0	2	2	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	60	-	-	80	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	32	316	57	58	484	42	52	11	31	32	11	32
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	535	0	0	382	0	0	1062	1069	356	1062	1076	515
Stage 1	-	-	-	-	-	-	418	418	-	630	630	-
Stage 2	-	-	-	-	-	-	644	651	-	432	446	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1028	-	-	1171	-	-	200	220	686	200	218	558
Stage 1	-	-	-	-	-	-	610	589	-	468	473	-
Stage 2	-	-	-	-	-	-	460	463	-	600	572	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1019	-	-	1161	-	-	168	199	679	170	197	553
Mov Cap-2 Maneuver	-	-	-	-	-	-	168	199	-	170	197	-
Stage 1	-	-	-	-	-	-	586	565	-	449	445	-
Stage 2	-	-	-	-	-	-	402	436	-	544	549	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.7			0.8			31			25.4		
HCM LOS							D			D		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	229	1019	-	-	1161	-	-	249				
HCM Lane V/C Ratio	0.405	0.031	-	-	0.05	-	-	0.296				
HCM Control Delay (s)	31	8.6	-	-	8.3	-	-	25.4				
HCM Lane LOS	D	A	-	-	A	-	-	D				
HCM 95th %tile Q(veh)	1.8	0.1	-	-	0.2	-	-	1.2				

HCM 6th Signalized Intersection Summary

3: Range Ave & W Steele Ln

Lance Drive Residential TIA
Near Term Plus Project PM (95-120 Seconds)











												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	321	81	60	442	50	92	200	40	60	420	50
Future Volume (veh/h)	40	321	81	60	442	50	92	200	40	60	420	50
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.96	1.00		0.93
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	42	334	79	62	460	50	96	208	24	62	438	41
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	524	934	221	596	1062	115	121	463	53	156	564	52
Arrive On Green	0.65	0.65	0.65	0.65	0.65	0.65	0.07	0.15	0.15	0.09	0.17	0.17
Sat Flow, veh/h	882	1445	342	964	1644	179	1767	3176	361	1767	3235	301
Grp Volume(v), veh/h	42	0	413	62	0	510	96	114	118	62	237	242
Grp Sat Flow(s),veh/h/ln	882	0	1787	964	0	1822	1767	1763	1774	1767	1763	1773
Q Serve(g_s), s	2.3	0.0	10.1	3.0	0.0	13.1	5.1	5.6	5.8	3.1	12.2	12.4
Cycle Q Clear(g_c), s	15.4	0.0	10.1	13.1	0.0	13.1	5.1	5.6	5.8	3.1	12.2	12.4
Prop In Lane	1.00		0.19	1.00		0.10	1.00		0.20	1.00		0.17
Lane Grp Cap(c), veh/h	524	0	1155	596	0	1178	121	257	258	156	308	309
V/C Ratio(X)	0.08	0.00	0.36	0.10	0.00	0.43	0.79	0.44	0.46	0.40	0.77	0.78
Avail Cap(c_a), veh/h	524	0	1155	596	0	1178	223	466	469	205	447	450
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.40	0.40	0.40	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.0	0.0	7.7	10.7	0.0	8.3	43.6	37.1	37.1	40.9	37.4	37.5
Incr Delay (d2), s/veh	0.3	0.0	0.9	0.4	0.0	1.2	1.8	0.2	0.2	0.6	2.6	3.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	3.6	0.7	0.0	4.8	2.2	2.4	2.4	1.4	5.3	5.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.3	0.0	8.6	11.1	0.0	9.4	45.3	37.2	37.3	41.6	40.1	40.5
LnGrp LOS	B	A	A	B	A	A	D	D	D	D	D	D
Approach Vol, veh/h		455			572			328			541	
Approach Delay, s/veh		8.9			9.6			39.6			40.4	
Approach LOS		A			A			D			D	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		65.0	9.5	20.5		65.0	12.3	17.7				
Change Period (Y+Rc), s		3.6	3.0	3.9		3.6	3.9	* 3.9				
Max Green Setting (Gmax), s		48.4	12.0	24.1		48.4	11.0	* 25				
Max Q Clear Time (g_c+I1), s		17.4	7.1	14.4		15.1	5.1	7.8				
Green Ext Time (p_c), s		0.9	0.0	0.7		1.2	0.0	0.4				
Intersection Summary												
HCM 6th Ctrl Delay			23.4									
HCM 6th LOS			C									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

HCM 6th Signalized Intersection Summary

4: Marlow Rd & Guerneville Rd

Lance Drive Residential TIA
Near Term Plus Project PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	180	436	130	290	476	121	140	620	203	71	730	80
Future Volume (veh/h)	180	436	130	290	476	121	140	620	203	71	730	80
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	189	459	57	305	501	108	147	653	126	75	768	77
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	199	652	410	246	620	133	141	820	577	226	905	91
Arrive On Green	0.11	0.18	0.18	0.14	0.22	0.22	0.08	0.23	0.23	0.13	0.28	0.28
Sat Flow, veh/h	1767	3526	1537	1767	2874	616	1767	3526	1538	1767	3229	324
Grp Volume(v), veh/h	189	459	57	305	306	303	147	653	126	75	419	426
Grp Sat Flow(s),veh/h/ln	1767	1763	1537	1767	1763	1727	1767	1763	1538	1767	1763	1790
Q Serve(g_s), s	10.1	11.6	1.2	13.2	15.7	15.8	7.6	16.6	0.0	3.7	21.3	21.3
Cycle Q Clear(g_c), s	10.1	11.6	1.2	13.2	15.7	15.8	7.6	16.6	0.0	3.7	21.3	21.3
Prop In Lane	1.00		1.00	1.00		0.36	1.00		1.00	1.00		0.18
Lane Grp Cap(c), veh/h	199	652	410	246	380	373	141	820	577	226	494	502
V/C Ratio(X)	0.95	0.70	0.14	1.24	0.80	0.81	1.04	0.80	0.22	0.33	0.85	0.85
Avail Cap(c_a), veh/h	199	1006	564	246	466	456	141	1054	679	226	557	565
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.96	0.96	0.96	0.45	0.45	0.45	0.67	0.67	0.67
Uniform Delay (d), s/veh	41.9	36.3	7.5	40.9	35.3	35.4	43.7	34.3	20.4	37.7	32.3	32.3
Incr Delay (d2), s/veh	49.4	1.4	0.2	136.3	15.8	16.7	61.5	1.5	0.1	0.6	7.5	7.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.0	4.9	0.6	14.9	8.1	8.1	5.6	7.0	1.8	1.6	9.8	9.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	91.3	37.7	7.7	177.2	51.2	52.2	105.2	35.9	20.5	38.3	39.8	39.7
LnGrp LOS	F	D	A	F	D	D	F	D	C	D	D	D
Approach Vol, veh/h	705			914			926			920		
Approach Delay, s/veh	49.6			93.6			44.8			39.6		
Approach LOS	D			F			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	23.3	12.9	31.9	16.0	26.2	17.4	27.4					
Change Period (Y+Rc), s	5.7	* 5.7	5.3	5.3	5.3	5.7	5.3	5.3				
Max Green Setting (Gmax), s	27	* 27	7.6	30.0	10.7	25.1	9.2	28.4				
Max Q Clear Time (g_c+I1), s	13.6	9.6	23.3	12.1	17.8	5.7	18.6					
Green Ext Time (p_c), s	0.0	2.5	0.0	2.8	0.0	2.1	0.0	3.2				

Intersection Summary

HCM 6th Ctrl Delay 57.3

HCM 6th LOS E

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary 5: Ridley Ave & Guerneville Rd

Lance Drive Residential TIA
Near Term Plus Project PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	690	40	74	847	20	20	10	57	20	10	20
Future Volume (veh/h)	20	690	40	74	847	20	20	10	57	20	10	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	22	742	42	80	911	22	22	11	10	22	11	0
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	591	2938	166	643	3046	74	96	36	23	117	46	0
Arrive On Green	0.87	0.87	0.87	1.00	1.00	1.00	0.06	0.06	0.06	0.06	0.06	0.00
Sat Flow, veh/h	595	3391	192	684	3516	85	636	587	371	882	748	0
Grp Volume(v), veh/h	22	386	398	80	457	476	43	0	0	33	0	0
Grp Sat Flow(s),veh/h/ln	595	1763	1820	684	1763	1838	1594	0	0	1629	0	0
Q Serve(g_s), s	0.5	3.6	3.6	0.6	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.5	3.6	3.6	4.1	0.0	0.0	2.3	0.0	0.0	1.6	0.0	0.0
Prop In Lane	1.00		0.11	1.00		0.05	0.51		0.23	0.67		0.00
Lane Grp Cap(c), veh/h	591	1527	1577	643	1527	1592	155	0	0	163	0	0
V/C Ratio(X)	0.04	0.25	0.25	0.12	0.30	0.30	0.28	0.00	0.00	0.20	0.00	0.00
Avail Cap(c_a), veh/h	591	1527	1577	643	1527	1592	526	0	0	530	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.90	0.90	0.90	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.9	1.1	1.1	0.1	0.0	0.0	42.9	0.0	0.0	42.6	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.4	0.3	0.0	0.0	0.0	0.4	0.0	0.0	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.2	0.2	0.0	0.0	0.0	1.0	0.0	0.0	0.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	1.0	1.4	1.4	0.1	0.0	0.0	43.3	0.0	0.0	42.9	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	D	A	A	D	A	A
Approach Vol, veh/h	806			1013			43			33		
Approach Delay, s/veh	1.4			0.0			43.3			42.9		
Approach LOS	A			A			D			D		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	86.2			8.8			86.2			8.8		
Change Period (Y+Rc), s	3.9			3.0			3.9			3.0		
Max Green Setting (Gmax), s	59.1			29.0			59.1			29.0		
Max Q Clear Time (g_c+I1), s	5.6			3.6			6.1			4.3		
Green Ext Time (p_c), s	1.6			0.1			2.1			0.1		

Intersection Summary

HCM 6th Ctrl Delay	2.4
HCM 6th LOS	A

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary 6: Lance Dr & Guerneville Rd

Lance Drive Residential TIA
Near Term Plus Project PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	108	603	20	60	910	228	10	43	40	131	48	66
Future Volume (veh/h)	108	603	20	60	910	228	10	43	40	131	48	66
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.99	0.99		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	112	628	20	62	948	221	10	45	5	136	50	57
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	138	687	22	301	1021	445	74	279	28	214	66	68
Arrive On Green	0.16	0.39	0.39	0.23	0.39	0.39	0.19	0.19	0.19	0.19	0.19	0.19
Sat Flow, veh/h	1767	3485	111	1767	3526	1535	159	1466	148	814	348	356
Grp Volume(v), veh/h	112	317	331	62	948	221	60	0	0	243	0	0
Grp Sat Flow(s), veh/h/ln	1767	1763	1833	1767	1763	1535	1773	0	0	1518	0	0
Q Serve(g_s), s	5.8	16.2	16.2	2.7	24.4	10.4	0.0	0.0	0.0	11.9	0.0	0.0
Cycle Q Clear(g_c), s	5.8	16.2	16.2	2.7	24.4	10.4	2.6	0.0	0.0	14.5	0.0	0.0
Prop In Lane	1.00		0.06	1.00		1.00	0.17		0.08	0.56		0.23
Lane Grp Cap(c), veh/h	138	348	361	301	1021	445	381	0	0	348	0	0
V/C Ratio(X)	0.81	0.91	0.91	0.21	0.93	0.50	0.16	0.00	0.00	0.70	0.00	0.00
Avail Cap(c_a), veh/h	162	737	766	301	1473	641	620	0	0	554	0	0
HCM Platoon Ratio	2.00	2.00	2.00	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.86	0.86	0.86	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	39.4	28.0	28.0	31.5	28.3	23.9	32.2	0.0	0.0	36.8	0.0	0.0
Incr Delay (d2), s/veh	19.8	4.0	3.9	0.1	13.8	3.4	0.1	0.0	0.0	1.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	5.3	5.5	1.1	10.6	3.8	1.2	0.0	0.0	5.5	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.2	32.0	31.9	31.6	42.0	27.3	32.3	0.0	0.0	37.8	0.0	0.0
LnGrp LOS	E	C	C	C	D	C	C	A	A	D	A	A
Approach Vol, veh/h	760			1231			60			243		
Approach Delay, s/veh	35.9			38.9			32.3			37.8		
Approach LOS	D			D			C			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	15.0	24.0		22.7	12.7	32.8		22.7				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		4.6				
Max Green Setting (Gmax), s	39.7	39.7		31.4	8.7	39.7		31.4				
Max Q Clear Time (g_c+14), s	18.2	18.2		16.5	7.8	26.4		4.6				
Green Ext Time (p_c), s	0.0	0.5		0.3	0.0	1.1		0.1				

Intersection Summary

HCM 6th Ctrl Delay	37.6
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

7: N Dutton Ave/Westberry Dr & Guerneville Rd

Lance Drive Residential TIA
Near Term Plus Project PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	689	125	460	957	20	201	10	450	10	10	10
Future Volume (veh/h)	10	689	125	460	957	20	201	10	450	10	10	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	11	741	126	495	1029	21	224	0	133	11	11	7
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	28	791	134	1422	2339	48	212	0	746	30	30	19
Arrive On Green	0.02	0.26	0.26	0.41	0.66	0.66	0.06	0.00	0.06	0.05	0.05	0.05
Sat Flow, veh/h	1767	3003	510	3428	3531	72	3534	0	1557	658	658	419
Grp Volume(v), veh/h	11	435	432	495	514	536	224	0	133	29	0	0
Grp Sat Flow(s), veh/h/ln	1767	1763	1750	1714	1763	1840	1767	0	1557	1736	0	0
Q Serve(g_s), s	0.6	22.9	22.9	9.4	13.2	13.2	5.7	0.0	0.0	1.5	0.0	0.0
Cycle Q Clear(g_c), s	0.6	22.9	22.9	9.4	13.2	13.2	5.7	0.0	0.0	1.5	0.0	0.0
Prop In Lane	1.00		0.29	1.00		0.04	1.00		1.00	0.38		0.24
Lane Grp Cap(c), veh/h	28	464	461	1422	1168	1219	212	0	746	80	0	0
V/C Ratio(X)	0.39	0.94	0.94	0.35	0.44	0.44	1.06	0.00	0.18	0.36	0.00	0.00
Avail Cap(c_a), veh/h	112	471	468	1422	1168	1219	212	0	746	506	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.95	0.95	0.95	0.62	0.62	0.62	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	46.3	34.2	34.2	19.0	7.6	7.6	44.7	0.0	14.3	44.0	0.0	0.0
Incr Delay (d2), s/veh	3.1	27.7	27.9	0.0	0.7	0.7	77.4	0.0	0.0	1.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	12.8	12.8	3.5	4.3	4.4	4.7	0.0	1.5	0.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.4	61.9	62.1	19.0	8.4	8.4	122.1	0.0	14.3	45.0	0.0	0.0
LnGrp LOS	D	E	E	B	A	A	F	A	B	D	A	A
Approach Vol, veh/h	878			1545			357			29		
Approach Delay, s/veh	61.8			11.8			81.9			45.0		
Approach LOS	E			B			F			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	44.7	30.3		9.0	6.8	68.2		11.0				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		5.3				
Max Green Setting (Gmax), s	5.3	25.4		27.7	6.0	35.1		5.7				
Max Q Clear Time (g_c+I1), s	11.4	24.9		3.5	2.6	15.2		7.7				
Green Ext Time (p_c), s	0.1	0.1		0.0	0.0	0.9		0.0				

Intersection Summary

HCM 6th Ctrl Delay 36.7

HCM 6th LOS D

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

8: Herbert St/Coffey Ln & Guerneville Rd

Lance Drive Residential TIA
Near Term Plus Project PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	181	908	60	50	1187	90	40	20	30	100	30	230
Future Volume (veh/h)	181	908	60	50	1187	90	40	20	30	100	30	230
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.99	1.00		0.93	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	197	987	61	54	1290	94	43	22	16	109	33	51
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	149	1038	64	539	1762	128	83	42	31	166	50	312
Arrive On Green	0.08	0.31	0.31	0.30	0.53	0.53	0.09	0.09	0.09	0.12	0.12	0.12
Sat Flow, veh/h	1767	3363	208	1767	3330	242	913	467	340	1372	415	1487
Grp Volume(v), veh/h	197	517	531	54	681	703	81	0	0	142	0	51
Grp Sat Flow(s), veh/h/ln	1767	1763	1808	1767	1763	1810	1719	0	0	1787	0	1487
Q Serve(g_s), s	9.7	33.0	33.0	2.5	34.1	34.4	5.2	0.0	0.0	8.7	0.0	3.2
Cycle Q Clear(g_c), s	9.7	33.0	33.0	2.5	34.1	34.4	5.2	0.0	0.0	8.7	0.0	3.2
Prop In Lane	1.00		0.11	1.00		0.13	0.53		0.20	0.77		1.00
Lane Grp Cap(c), veh/h	149	544	558	539	933	958	156	0	0	216	0	312
V/C Ratio(X)	1.32	0.95	0.95	0.10	0.73	0.73	0.52	0.00	0.00	0.66	0.00	0.16
Avail Cap(c_a), veh/h	149	581	596	539	933	958	374	0	0	404	0	469
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.81	0.81	0.81	0.79	0.79	0.79	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	52.7	38.9	38.9	28.7	20.8	20.8	49.9	0.0	0.0	48.3	0.0	37.6
Incr Delay (d2), s/veh	177.5	24.5	24.1	0.0	4.0	4.0	1.0	0.0	0.0	1.3	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	17.4	17.8	1.1	14.0	14.5	2.3	0.0	0.0	3.9	0.0	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	230.2	63.4	63.0	28.7	24.8	24.8	50.9	0.0	0.0	49.5	0.0	37.7
LnGrp LOS	F	E	E	C	C	C	D	A	A	D	A	D
Approach Vol, veh/h	1245			1438			81			193		
Approach Delay, s/veh	89.6			24.9			50.9			46.4		
Approach LOS	F			C			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	40.4	40.8		18.8	15.0	66.2		15.0				
Change Period (Y+Rc), s	5.3	5.3		4.9	5.3	5.3		4.6				
Max Green Setting (Gmax), s	60.0	37.9		26.0	9.7	34.2		25.0				
Max Q Clear Time (g_c+14), s	14.5	35.0		10.7	11.7	36.4		7.2				
Green Ext Time (p_c), s	0.0	0.5		0.1	0.0	0.0		0.1				

Intersection Summary

HCM 6th Ctrl Delay	54.3
HCM 6th LOS	D

HCM 6th Signalized Intersection Summary

9: Range Ave & Guerneville Rd

Lance Drive Residential TIA
Near Term Plus Project PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	150	666	202	90	834	22	273	160	140	101	220	240
Future Volume (veh/h)	150	666	202	90	834	22	273	160	140	101	220	240
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.93
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	156	694	0	94	869	0	174	321	71	105	229	89
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	475	1690		112	965		293	488	106	134	186	69
Arrive On Green	0.27	0.48	0.00	0.06	0.27	0.00	0.17	0.17	0.17	0.03	0.03	0.03
Sat Flow, veh/h	1767	3618	0	1767	3618	0	1767	2937	639	1767	2457	914
Grp Volume(v), veh/h	156	694	0	94	869	0	174	201	191	105	161	157
Grp Sat Flow(s),veh/h/ln	1767	1763	0	1767	1763	0	1767	1856	1721	1767	1763	1608
Q Serve(g_s), s	6.7	12.1	0.0	5.0	22.6	0.0	8.7	9.6	9.9	5.6	7.2	7.2
Cycle Q Clear(g_c), s	6.7	12.1	0.0	5.0	22.6	0.0	8.7	9.6	9.9	5.6	7.2	7.2
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.37	1.00		0.57
Lane Grp Cap(c), veh/h	475	1690		112	965		293	308	286	134	134	122
V/C Ratio(X)	0.33	0.41		0.84	0.90		0.59	0.65	0.67	0.78	1.21	1.29
Avail Cap(c_a), veh/h	475	1690		112	1058		610	641	594	134	134	122
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	0.78	0.78	0.00	0.91	0.91	0.00	1.00	1.00	1.00	0.62	0.62	0.62
Uniform Delay (d), s/veh	27.9	16.0	0.0	44.0	33.2	0.0	36.6	37.0	37.2	45.5	46.3	46.3
Incr Delay (d2), s/veh	0.1	0.6	0.0	36.7	8.6	0.0	0.7	0.9	1.0	15.7	128.7	161.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	4.6	0.0	3.3	10.4	0.0	3.8	4.4	4.2	3.1	8.0	8.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.0	16.6	0.0	80.7	41.9	0.0	37.4	37.9	38.2	61.2	175.0	207.6
LnGrp LOS	C	B		F	D		D	D	D	E	F	F
Approach Vol, veh/h	850		A	963		A	566			423		
Approach Delay, s/veh	18.7			45.7			37.8			158.9		
Approach LOS	B			D			D			F		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	1.3	50.8		12.5	30.8	31.3		20.4				
Change Period (Y+Rc), s	5.3	5.3		5.3	5.3	5.3		4.6				
Max Green Setting (Gmax), s	6.0	28.5		7.2	6.0	28.5		32.8				
Max Q Clear Time (g_c+11), s	14.1			9.2	8.7	24.6		11.9				
Green Ext Time (p_c), s	0.0	0.8		0.0	0.0	0.7		0.3				

Intersection Summary

HCM 6th Ctrl Delay 53.0

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

10: Guerneville Rd & Steele Wy

Lance Drive Residential TIA
Near Term Plus Project PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	775	102	130	853	12	73	40	160	321	50	20
Future Volume (veh/h)	20	775	102	130	853	12	73	40	160	321	50	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	20	791	77	133	870	12	58	64	71	364	0	4
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	620	1929	977	218	925	13	145	153	226	465	0	753
Arrive On Green	0.35	0.55	0.55	0.06	0.26	0.26	0.08	0.08	0.08	0.13	0.00	0.13
Sat Flow, veh/h	1767	3526	1550	3428	3560	49	1767	1856	1532	3534	0	1526
Grp Volume(v), veh/h	20	791	77	133	431	451	58	64	71	364	0	4
Grp Sat Flow(s), veh/h/ln	1767	1763	1550	1714	1763	1846	1767	1856	1532	1767	0	1526
Q Serve(g_s), s	0.8	14.4	2.1	4.2	26.3	26.3	3.4	3.6	4.6	11.0	0.0	0.0
Cycle Q Clear(g_c), s	0.8	14.4	2.1	4.2	26.3	26.3	3.4	3.6	4.6	11.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.03	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	620	1929	977	218	458	480	145	153	226	465	0	753
V/C Ratio(X)	0.03	0.41	0.08	0.61	0.94	0.94	0.40	0.42	0.31	0.78	0.00	0.01
Avail Cap(c_a), veh/h	620	1929	977	221	476	499	434	455	476	868	0	927
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.80	0.80	0.80	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.4	14.5	8.0	50.2	39.9	39.9	47.9	48.0	42.1	46.2	0.0	14.8
Incr Delay (d2), s/veh	0.0	0.5	0.1	3.4	26.1	25.3	0.7	0.7	0.3	1.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	5.6	0.9	1.9	14.4	15.0	1.5	1.7	1.7	4.9	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	23.4	15.1	8.1	53.5	66.0	65.2	48.6	48.7	42.4	47.3	0.0	14.8
LnGrp LOS	C	B	A	D	E	E	D	D	D	D	A	B
Approach Vol, veh/h	888			1015			193			368		
Approach Delay, s/veh	14.6			64.0			46.3			47.0		
Approach LOS	B			E			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	1.9	65.1		19.4	43.5	33.5		13.6				
Change Period (Y+Rc), s	4.9	4.9		4.9	4.9	4.9		4.6				
Max Green Setting (Gmax), s	29.6			27.0	7.0	29.7		27.0				
Max Q Clear Time (g_c+16, s)	16.4			13.0	2.8	28.3		6.6				
Green Ext Time (p_c), s	0.0	1.0		0.1	0.0	0.2		0.1				

Intersection Summary

HCM 6th Ctrl Delay 42.3

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

11: Cleveland Ave & Guerneville Rd

Lance Drive Residential TIA
Near Term Plus Project PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↑↑↔		↔↔	↑↑	↔	↔	↑↑		↔	↑↑	
Traffic Volume (veh/h)	110	1086	80	310	1295	200	90	130	230	410	340	120
Future Volume (veh/h)	110	1086	80	310	1295	200	90	130	230	410	340	120
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.98	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	115	1131	75	323	1349	142	94	135	46	296	538	106
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	240	1472	98	393	1228	536	288	423	138	375	635	125
Arrive On Green	0.07	0.30	0.30	0.04	0.11	0.11	0.16	0.16	0.16	0.21	0.21	0.21
Sat Flow, veh/h	3428	4844	321	3428	3526	1538	1767	2596	847	1767	2997	588
Grp Volume(v), veh/h	115	788	418	323	1349	142	94	90	91	296	332	312
Grp Sat Flow(s), veh/h/ln	1714	1689	1788	1714	1763	1538	1767	1763	1681	1767	1856	1729
Q Serve(g_s), s	3.1	20.1	20.2	8.9	33.1	8.0	4.5	4.3	4.6	15.1	16.3	16.5
Cycle Q Clear(g_c), s	3.1	20.1	20.2	8.9	33.1	8.0	4.5	4.3	4.6	15.1	16.3	16.5
Prop In Lane	1.00		0.18	1.00		1.00	1.00		0.50	1.00		0.34
Lane Grp Cap(c), veh/h	240	1026	543	393	1228	536	288	288	274	375	393	366
V/C Ratio(X)	0.48	0.77	0.77	0.82	1.10	0.26	0.33	0.31	0.33	0.79	0.84	0.85
Avail Cap(c_a), veh/h	253	1026	543	422	1228	536	288	288	274	502	527	491
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.47	0.47	0.47	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.5	30.0	30.0	44.7	42.0	30.9	35.1	35.1	35.2	35.4	35.9	36.0
Incr Delay (d2), s/veh	0.5	3.2	6.0	5.3	50.9	0.0	3.0	2.8	3.2	4.2	7.2	8.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	8.3	9.2	4.3	24.2	3.1	2.1	2.0	2.1	6.7	7.9	7.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.0	33.3	36.0	50.0	92.9	31.0	38.1	37.9	38.4	39.7	43.1	44.2
LnGrp LOS	D	C	D	D	F	C	D	D	D	D	D	D
Approach Vol, veh/h	1321			1814			275			940		
Approach Delay, s/veh	35.0			80.4			38.1			42.4		
Approach LOS	C			F			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.8	33.8		20.4	11.6	38.0		25.0				
Change Period (Y+Rc), s	4.9	4.9		4.9	4.9	4.9		4.9				
Max Green Setting (Gmax), s	1.3	28.4		8.3	7.0	33.1		27.0				
Max Q Clear Time (g_c+I10), s	11.0	22.2		6.6	5.1	35.1		18.5				
Green Ext Time (p_c), s	0.0	1.1		0.0	0.0	0.0		0.5				

Intersection Summary

HCM 6th Ctrl Delay 55.7

HCM 6th LOS E

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 12: US 101 SB Ramps & Guerneville Rd

Lance Drive Residential TIA
Near Term Plus Project PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑					↑	↑	↑
Traffic Volume (veh/h)	0	1179	567	300	1412	0	0	0	0	290	70	393
Future Volume (veh/h)	0	1179	567	300	1412	0	0	0	0	290	70	393
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1856	1856	1856	1856	0				1856	1856	1856
Adj Flow Rate, veh/h	0	1215	194	309	1456	0				186	231	371
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	1408	421	375	1548	0				815	855	725
Arrive On Green	0.00	0.28	0.28	0.11	0.44	0.00				0.46	0.46	0.46
Sat Flow, veh/h	0	5233	1514	3428	3618	0				1767	1856	1572
Grp Volume(v), veh/h	0	1215	194	309	1456	0				186	231	371
Grp Sat Flow(s),veh/h/ln	0	1689	1514	1714	1763	0				1767	1856	1572
Q Serve(g_s), s	0.0	21.6	10.1	8.4	37.5	0.0				6.0	7.3	15.8
Cycle Q Clear(g_c), s	0.0	21.6	10.1	8.4	37.5	0.0				6.0	7.3	15.8
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1408	421	375	1548	0				815	855	725
V/C Ratio(X)	0.00	0.86	0.46	0.82	0.94	0.00				0.23	0.27	0.51
Avail Cap(c_a), veh/h	0	1925	575	516	2052	0				815	855	725
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.50	0.50	0.68	0.68	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	32.6	28.4	41.4	25.5	0.0				15.4	15.8	18.1
Incr Delay (d2), s/veh	0.0	1.3	0.1	3.8	4.9	0.0				0.7	0.8	2.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	8.7	3.6	3.7	15.6	0.0				2.4	3.0	5.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	33.8	28.5	45.2	30.4	0.0				16.1	16.5	20.6
LnGrp LOS	A	C	C	D	C	A				B	B	C
Approach Vol, veh/h		1409			1765						788	
Approach Delay, s/veh		33.1			33.0						18.4	
Approach LOS		C			C						B	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	5.3	31.3		48.4		46.6						
Change Period (Y+Rc), s	4.9	4.9		4.6		4.9						
Max Green Setting (Gmax), s	4.3	36.1		30.2		55.3						
Max Q Clear Time (g_c+I10), s	4	23.6		17.8		39.5						
Green Ext Time (p_c), s	0.0	1.7		0.2		2.2						

Intersection Summary

HCM 6th Ctrl Delay	30.1
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 13: US 101 NB Ramps & Guerneville Rd/Steele Ln

Lance Drive Residential TIA
Near Term Plus Project PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↱↱			↰↰↱		↰	↰↱	↱			
Traffic Volume (veh/h)	441	1038	0	0	1013	240	699	10	330	0	0	0
Future Volume (veh/h)	441	1038	0	0	1013	240	699	10	330	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1856	1856	0	0	1856	1856	1856	1856	1856			
Adj Flow Rate, veh/h	459	1081	0	0	1055	223	818	0	188			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	3	3	0	0	3	3	3	3	3			
Cap, veh/h	1096	2297	0	0	1168	247	879	0	391			
Arrive On Green	0.64	1.00	0.00	0.00	0.28	0.28	0.25	0.00	0.25			
Sat Flow, veh/h	3428	3618	0	0	4337	880	3534	0	1572			
Grp Volume(v), veh/h	459	1081	0	0	854	424	818	0	188			
Grp Sat Flow(s),veh/h/ln	1714	1763	0	0	1689	1673	1767	0	1572			
Q Serve(g_s), s	6.3	0.0	0.0	0.0	23.2	23.2	21.5	0.0	9.7			
Cycle Q Clear(g_c), s	6.3	0.0	0.0	0.0	23.2	23.2	21.5	0.0	9.7			
Prop In Lane	1.00		0.00	0.00		0.53	1.00		1.00			
Lane Grp Cap(c), veh/h	1096	2297	0	0	946	469	879	0	391			
V/C Ratio(X)	0.42	0.47	0.00	0.00	0.90	0.90	0.93	0.00	0.48			
Avail Cap(c_a), veh/h	1096	2297	0	0	1177	583	1168	0	520			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.61	0.61	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	12.8	0.0	0.0	0.0	32.9	33.0	34.9	0.0	30.5			
Incr Delay (d2), s/veh	0.1	0.4	0.0	0.0	7.5	13.7	9.5	0.0	0.3			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	2.0	0.1	0.0	0.0	10.1	10.8	9.8	0.0	3.5			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.8	0.4	0.0	0.0	40.4	46.7	44.4	0.0	30.8			
LnGrp LOS	B	A	A	A	D	D	D	A	C			
Approach Vol, veh/h	1540			1278			1006					
Approach Delay, s/veh	4.1			42.5			41.9					
Approach LOS	A			D			D					
Timer - Assigned Phs	2			5			6			8		
Phs Duration (G+Y+Rc), s	66.8			35.3			31.5			28.2		
Change Period (Y+Rc), s	4.9			4.9			4.9			4.6		
Max Green Setting (Gmax), s	54.1			16.1			33.1			31.4		
Max Q Clear Time (g_c+I1), s	2.0			8.3			25.2			23.5		
Green Ext Time (p_c), s	1.6			0.1			1.4			0.1		

Intersection Summary

HCM 6th Ctrl Delay	26.9
HCM 6th LOS	C










Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 14: Stony Point Rd/Marlow Rd & W College Ave

Lance Drive Residential TIA
Near Term Plus Project PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	93	260	110	224	370	210	160	770	266	170	832	128
Future Volume (veh/h)	93	260	110	224	370	210	160	770	266	170	832	128
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	98	274	76	236	389	155	168	811	157	179	876	124
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	356	391	106	472	514	202	173	900	814	196	830	118
Arrive On Green	0.20	0.14	0.14	0.27	0.21	0.21	0.10	0.26	0.26	0.11	0.27	0.27
Sat Flow, veh/h	1767	2728	740	1767	2460	966	1767	3526	1544	1767	3093	438
Grp Volume(v), veh/h	98	175	175	236	277	267	168	811	157	179	499	501
Grp Sat Flow(s),veh/h/ln	1767	1763	1705	1767	1763	1663	1767	1763	1544	1767	1763	1768
Q Serve(g_s), s	4.5	9.0	9.3	10.7	14.0	14.4	9.0	21.1	2.1	9.5	25.5	25.5
Cycle Q Clear(g_c), s	4.5	9.0	9.3	10.7	14.0	14.4	9.0	21.1	2.1	9.5	25.5	25.5
Prop In Lane	1.00		0.43	1.00		0.58	1.00		1.00	1.00		0.25
Lane Grp Cap(c), veh/h	356	252	244	472	368	347	173	900	814	196	473	474
V/C Ratio(X)	0.28	0.69	0.72	0.50	0.75	0.77	0.97	0.90	0.19	0.91	1.06	1.06
Avail Cap(c_a), veh/h	356	482	467	472	542	511	173	931	828	196	473	474
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	0.43	0.43	0.43
Uniform Delay (d), s/veh	32.1	38.7	38.9	29.4	35.3	35.4	42.7	34.2	3.6	41.8	34.7	34.8
Incr Delay (d2), s/veh	0.4	3.4	3.9	0.3	1.1	1.4	59.7	11.6	0.1	22.4	42.9	42.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	4.0	4.0	4.4	5.9	5.7	6.7	10.0	0.8	5.2	16.0	16.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.5	42.1	42.8	29.7	36.4	36.8	102.4	45.8	3.7	64.2	77.7	77.7
LnGrp LOS	C	D	D	C	D	D	F	D	A	E	F	F
Approach Vol, veh/h	448			780			1136			1179		
Approach Delay, s/veh	40.3			34.5			48.3			75.6		
Approach LOS	D			C			D			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	30.7	18.9	14.6	30.8	24.5	25.1	15.9	29.5				
Change Period (Y+Rc), s	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3				
Max Green Setting (Gmax), s	30.0	26.0	9.3	25.5	9.8	29.2	9.7	25.1				
Max Q Clear Time (g_c+I1), s	11.3	11.3	11.0	27.5	6.5	16.4	11.5	23.1				
Green Ext Time (p_c), s	0.0	1.6	0.0	0.0	0.1	2.6	0.0	1.1				

Intersection Summary

HCM 6th Ctrl Delay 53.4

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

15: N Dutton Ave & W College Ave

Lance Drive Residential TIA
Near Term Plus Project PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	600	110	180	810	193	160	356	130	315	506	150
Future Volume (veh/h)	90	600	110	180	810	193	160	356	130	315	506	150
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No		No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	94	625	103	188	844	186	167	371	100	328	527	130
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	119	688	113	251	893	197	407	460	122	544	686	168
Arrive On Green	0.07	0.23	0.23	0.14	0.31	0.31	0.23	0.17	0.17	0.31	0.25	0.25
Sat Flow, veh/h	1767	3022	497	1767	2862	631	1767	2741	729	1767	2793	686
Grp Volume(v), veh/h	94	364	364	188	520	510	167	237	234	328	332	325
Grp Sat Flow(s),veh/h/ln	1767	1763	1756	1767	1763	1730	1767	1763	1707	1767	1763	1716
Q Serve(g_s), s	5.0	19.1	19.2	9.7	27.3	27.3	7.6	12.3	12.6	15.0	16.6	16.8
Cycle Q Clear(g_c), s	5.0	19.1	19.2	9.7	27.3	27.3	7.6	12.3	12.6	15.0	16.6	16.8
Prop In Lane	1.00		0.28	1.00		0.36	1.00		0.43	1.00		0.40
Lane Grp Cap(c), veh/h	119	401	400	251	550	540	407	296	286	544	433	421
V/C Ratio(X)	0.79	0.91	0.91	0.75	0.95	0.95	0.41	0.80	0.82	0.60	0.77	0.77
Avail Cap(c_a), veh/h	130	429	427	260	559	548	407	408	395	544	501	488
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.79	0.79	0.79	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.6	35.7	35.8	39.1	31.9	31.9	31.1	38.0	38.1	27.9	33.3	33.4
Incr Delay (d2), s/veh	18.4	17.7	18.2	9.6	24.7	25.0	0.2	5.3	6.6	1.3	4.9	5.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	9.9	9.9	4.8	14.9	14.6	3.2	5.6	5.6	6.2	7.4	7.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	62.1	53.4	54.0	48.7	56.6	56.9	31.3	43.3	44.7	29.3	38.2	38.7
LnGrp LOS	E	D	D	D	E	E	C	D	D	C	D	D
Approach Vol, veh/h	822				1218		638				985	
Approach Delay, s/veh	54.6				55.5		40.7				35.4	
Approach LOS	D				E		D				D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.4	25.5	24.9	27.2	9.4	33.5	32.3	19.8				
Change Period (Y+Rc), s	3.9	* 3.9	3.0	3.9	3.0	3.9	3.0	3.9				
Max Green Setting (Gmax), s	4.0	* 23	17.1	27.0	7.0	30.1	22.1	22.0				
Max Q Clear Time (g_c+I1), s	11.3	21.2	9.6	18.8	7.0	29.3	17.0	14.6				
Green Ext Time (p_c), s	0.0	0.4	0.0	1.0	0.0	0.3	0.1	0.7				

Intersection Summary

HCM 6th Ctrl Delay 47.3

HCM 6th LOS D

Notes





User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection

Intersection Delay, s/veh 8.8

Intersection LOS A




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	50	0	62	78	99	0	6	36	85	7	13
Future Vol, veh/h	7	50	0	62	78	99	0	6	36	85	7	13
Peak Hour Factor	0.86	0.86	0.92	0.92	0.86	0.86	0.92	0.92	0.92	0.86	0.92	0.86
Heavy Vehicles, %	3	3	2	2	3	3	2	2	2	3	2	3
Mvmt Flow	8	58	0	67	91	115	0	7	39	99	8	15
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.1	9.2	7.6	8.8
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	12%	26%	81%
Vol Thru, %	14%	88%	33%	7%
Vol Right, %	86%	0%	41%	12%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	42	57	239	105
LT Vol	0	7	62	85
Through Vol	6	50	78	7
RT Vol	36	0	99	13
Lane Flow Rate	46	66	273	122
Geometry Grp	1	1	1	1
Degree of Util (X)	0.055	0.086	0.32	0.164
Departure Headway (Hd)	4.33	4.669	4.218	4.846
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	826	767	852	740
Service Time	2.362	2.699	2.24	2.873
HCM Lane V/C Ratio	0.056	0.086	0.32	0.165
HCM Control Delay	7.6	8.1	9.2	8.8
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.2	0.3	1.4	0.6




HCM 6th TWSC
17: Iroquois St & Project Driveway (1)

Lance Drive Residential TIA
Near Term Plus Project PM (95-120 Seconds)

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	5	8	97	96	3
Future Vol, veh/h	1	5	8	97	96	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	5	9	105	104	3
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	229	106	107	0	-	0
Stage 1	106	-	-	-	-	-
Stage 2	123	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	759	948	1484	-	-	-
Stage 1	918	-	-	-	-	-
Stage 2	902	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	754	948	1484	-	-	-
Mov Cap-2 Maneuver	754	-	-	-	-	-
Stage 1	912	-	-	-	-	-
Stage 2	902	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	9	0.6		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1484	-	909	-	-	
HCM Lane V/C Ratio	0.006	-	0.007	-	-	
HCM Control Delay (s)	7.4	0	9	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	




HCM 6th TWSC
18: Iroquois St & Project Driveway (2)

Lance Drive Residential TIA
Near Term Plus Project PM (95-120 Seconds)

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	6	9	103	99	2
Future Vol, veh/h	2	6	9	103	99	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	7	10	112	108	2
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	241	109	110	0	-	0
Stage 1	109	-	-	-	-	-
Stage 2	132	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	747	945	1480	-	-	-
Stage 1	916	-	-	-	-	-
Stage 2	894	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	742	945	1480	-	-	-
Mov Cap-2 Maneuver	742	-	-	-	-	-
Stage 1	910	-	-	-	-	-
Stage 2	894	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	9.1	0.6		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1480	-	885	-	-	
HCM Lane V/C Ratio	0.007	-	0.01	-	-	
HCM Control Delay (s)	7.4	0	9.1	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	




HCM 6th TWSC
19: Project Driveway (3) & Lance Dr

Lance Drive Residential TIA
Near Term Plus Project PM (95-120 Seconds)

Intersection						
Int Delay, s/veh	1.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	168	3	43	236	3	27
Future Vol, veh/h	168	3	43	236	3	27
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	183	3	47	257	3	29
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	186	0	536	185
Stage 1	-	-	-	-	185	-
Stage 2	-	-	-	-	351	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1388	-	505	857
Stage 1	-	-	-	-	847	-
Stage 2	-	-	-	-	713	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1388	-	485	857
Mov Cap-2 Maneuver	-	-	-	-	485	-
Stage 1	-	-	-	-	847	-
Stage 2	-	-	-	-	685	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		1.2		9.7	
HCM LOS					A	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	796	-	-	1388	-	
HCM Lane V/C Ratio	0.041	-	-	0.034	-	
HCM Control Delay (s)	9.7	-	-	7.7	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0.1	-	-	0.1	-	

HCM 6th TWSC
20: Guerneville Rd & Project Driveway (4)























Lance Drive Residential TIA
Near Term Plus Project PM (95-120 Seconds)

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	9	708	956	20	13	5
Future Vol, veh/h	9	708	956	20	13	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	770	1039	22	14	5
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	1061	0	-	0	1455	531
Stage 1	-	-	-	-	1050	-
Stage 2	-	-	-	-	405	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	652	-	-	-	121	493
Stage 1	-	-	-	-	298	-
Stage 2	-	-	-	-	642	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	652	-	-	-	118	493
Mov Cap-2 Maneuver	-	-	-	-	118	-
Stage 1	-	-	-	-	290	-
Stage 2	-	-	-	-	642	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.2	0		32.6		
HCM LOS				D		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	652	-	-	-	150	
HCM Lane V/C Ratio	0.015	-	-	-	0.13	
HCM Control Delay (s)	10.6	0.1	-	-	32.6	
HCM Lane LOS	B	A	-	-	D	
HCM 95th %tile Q(veh)	0	-	-	-	0.4	

HCM 6th Signalized Intersection Summary







1: Marlow Rd & Marlow Ct/W Steele Ln

Lance Drive Residential TIA
Near Term Plus Project PM (120 Seconds)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	0	10	170	10	158	10	651	170	132	741	10
Future Volume (veh/h)	10	0	10	170	10	158	10	651	170	132	741	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.96	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	11	0	0	187	0	97	11	685	118	139	780	10
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	48	0	0	1719	0	913	23	820	1118	169	1125	14
Arrive On Green	0.03	0.00	0.00	0.49	0.00	0.49	0.01	0.23	0.23	0.10	0.32	0.32
Sat Flow, veh/h	1767	0	0	3534	0	1568	1767	3526	1517	1767	3563	46
Grp Volume(v), veh/h	11	0	0	187	0	97	11	685	118	139	386	404
Grp Sat Flow(s),veh/h/ln	1767	0	0	1767	0	1568	1767	1763	1517	1767	1763	1846
Q Serve(g_s), s	0.7	0.0	0.0	3.4	0.0	0.0	0.7	22.2	2.8	9.3	23.0	23.0
Cycle Q Clear(g_c), s	0.7	0.0	0.0	3.4	0.0	0.0	0.7	22.2	2.8	9.3	23.0	23.0
Prop In Lane	1.00		0.00	1.00		1.00	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	48	0	0	1719	0	913	23	820	1118	169	556	583
V/C Ratio(X)	0.23	0.00	0.00	0.11	0.00	0.11	0.49	0.84	0.11	0.82	0.69	0.69
Avail Cap(c_a), veh/h	227	0	0	1719	0	913	149	1031	1209	517	883	925
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.66	0.66	0.66	1.00	1.00	1.00
Uniform Delay (d), s/veh	57.2	0.0	0.0	16.7	0.0	11.2	58.8	43.9	5.1	53.2	36.0	36.0
Incr Delay (d2), s/veh	2.4	0.0	0.0	0.1	0.0	0.2	10.3	3.3	0.0	9.4	1.6	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	1.4	0.0	1.2	0.4	9.9	2.9	4.5	10.0	10.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.6	0.0	0.0	16.8	0.0	11.4	69.1	47.2	5.2	62.7	37.5	37.5
LnGrp LOS	E	A	A	B	A	B	E	D	A	E	D	D
Approach Vol, veh/h		11			284			814			929	
Approach Delay, s/veh		59.6			15.0			41.4			41.3	
Approach LOS		E			B			D			D	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		63.0	6.4	42.8		7.8	16.4	32.8				
Change Period (Y+Rc), s		4.6	4.9	4.9		4.6	4.9	4.9				
Max Green Setting (Gmax), s		15.4	10.1	60.1		15.4	35.1	35.1				
Max Q Clear Time (g_c+I1), s		5.4	2.7	25.0		2.7	11.3	24.2				
Green Ext Time (p_c), s		0.7	0.0	5.4		0.0	0.3	3.7				
Intersection Summary												
HCM 6th Ctrl Delay				37.8								
HCM 6th LOS				D								
Notes												
User approved pedestrian interval to be less than phase max green.												
User approved volume balancing among the lanes for turning movement.												






















HCM 6th TWSC
2: Iroquois St/Apple Valley Ln & W Steele Ln

Lance Drive Residential TIA
Near Term Plus Project PM (120 Seconds)

Intersection												
Int Delay, s/veh	4.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	30	300	54	55	460	40	49	10	29	30	10	30
Future Vol, veh/h	30	300	54	55	460	40	49	10	29	30	10	30
Conflicting Peds, #/hr	9	0	9	9	0	9	1	0	2	2	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	60	-	-	80	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	32	316	57	58	484	42	52	11	31	32	11	32
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	535	0	0	382	0	0	1062	1069	356	1062	1076	515
Stage 1	-	-	-	-	-	-	418	418	-	630	630	-
Stage 2	-	-	-	-	-	-	644	651	-	432	446	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1028	-	-	1171	-	-	200	220	686	200	218	558
Stage 1	-	-	-	-	-	-	610	589	-	468	473	-
Stage 2	-	-	-	-	-	-	460	463	-	600	572	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1019	-	-	1161	-	-	168	199	679	170	197	553
Mov Cap-2 Maneuver	-	-	-	-	-	-	168	199	-	170	197	-
Stage 1	-	-	-	-	-	-	586	565	-	449	445	-
Stage 2	-	-	-	-	-	-	402	436	-	544	549	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.7			0.8			31			25.4		
HCM LOS							D			D		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	229	1019	-	-	1161	-	-	249				
HCM Lane V/C Ratio	0.405	0.031	-	-	0.05	-	-	0.296				
HCM Control Delay (s)	31	8.6	-	-	8.3	-	-	25.4				
HCM Lane LOS	D	A	-	-	A	-	-	D				
HCM 95th %tile Q(veh)	1.8	0.1	-	-	0.2	-	-	1.2				

HCM 6th Signalized Intersection Summary 3: Range Ave & W Steele Ln

Lance Drive Residential TIA
Near Term Plus Project PM (120 Seconds)











												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	321	81	60	442	50	92	200	40	60	420	50
Future Volume (veh/h)	40	321	81	60	442	50	92	200	40	60	420	50
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.96	1.00		0.92
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	42	334	79	62	460	50	96	208	24	62	438	40
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	560	994	235	633	1131	123	119	419	48	150	509	46
Arrive On Green	0.69	0.69	0.69	0.69	0.69	0.69	0.07	0.13	0.13	0.08	0.16	0.16
Sat Flow, veh/h	882	1445	342	964	1644	179	1767	3174	361	1767	3241	294
Grp Volume(v), veh/h	42	0	413	62	0	510	96	114	118	62	237	241
Grp Sat Flow(s),veh/h/ln	882	0	1787	964	0	1822	1767	1763	1772	1767	1763	1772
Q Serve(g_s), s	2.6	0.0	11.3	3.3	0.0	14.6	6.4	7.2	7.4	4.0	15.7	15.9
Cycle Q Clear(g_c), s	17.2	0.0	11.3	14.6	0.0	14.6	6.4	7.2	7.4	4.0	15.7	15.9
Prop In Lane	1.00		0.19	1.00		0.10	1.00		0.20	1.00		0.17
Lane Grp Cap(c), veh/h	560	0	1229	633	0	1254	119	233	234	150	277	278
V/C Ratio(X)	0.08	0.00	0.34	0.10	0.00	0.41	0.80	0.49	0.50	0.41	0.86	0.87
Avail Cap(c_a), veh/h	560	0	1229	633	0	1254	236	560	563	162	486	489
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.56	0.56	0.56	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.8	0.0	7.6	10.6	0.0	8.1	55.2	48.3	48.4	52.1	49.3	49.3
Incr Delay (d2), s/veh	0.3	0.0	0.7	0.3	0.0	1.0	2.7	0.3	0.3	0.7	3.0	3.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	4.2	0.7	0.0	5.5	2.9	3.1	3.3	1.8	7.0	7.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.1	0.0	8.3	10.9	0.0	9.1	57.9	48.7	48.8	52.7	52.2	52.5
LnGrp LOS	B	A	A	B	A	A	E	D	D	D	D	D
Approach Vol, veh/h		455			572			328			540	
Approach Delay, s/veh		8.7			9.3			51.4			52.4	
Approach LOS		A			A			D			D	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		86.2	11.1	22.7		86.2	14.1	19.7				
Change Period (Y+Rc), s		3.6	3.0	3.9		3.6	3.9	* 3.9				
Max Green Setting (Gmax), s		60.4	16.0	33.1		60.4	11.0	* 38				
Max Q Clear Time (g_c+I1), s		19.2	8.4	17.9		16.6	6.0	9.4				
Green Ext Time (p_c), s		1.0	0.0	0.8		1.2	0.0	0.4				
Intersection Summary												
HCM 6th Ctrl Delay			28.7									
HCM 6th LOS			C									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

HCM 6th Signalized Intersection Summary

4: Marlow Rd & Guerneville Rd

Lance Drive Residential TIA
Near Term Plus Project PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	180	436	130	290	476	121	140	620	203	71	730	80
Future Volume (veh/h)	180	436	130	290	476	121	140	620	203	71	730	80
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	189	459	57	305	501	108	147	653	126	75	768	78
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	218	601	416	331	684	147	174	792	640	241	847	86
Arrive On Green	0.12	0.17	0.17	0.19	0.24	0.24	0.10	0.22	0.22	0.05	0.09	0.09
Sat Flow, veh/h	1767	3526	1535	1767	2875	616	1767	3526	1537	1767	3224	327
Grp Volume(v), veh/h	189	459	57	305	306	303	147	653	126	75	420	426
Grp Sat Flow(s),veh/h/ln	1767	1763	1535	1767	1763	1728	1767	1763	1537	1767	1763	1789
Q Serve(g_s), s	12.6	14.9	1.4	20.3	19.2	19.4	9.8	21.2	0.0	4.9	28.3	28.3
Cycle Q Clear(g_c), s	12.6	14.9	1.4	20.3	19.2	19.4	9.8	21.2	0.0	4.9	28.3	28.3
Prop In Lane	1.00		1.00	1.00		0.36	1.00		1.00	1.00		0.18
Lane Grp Cap(c), veh/h	218	601	416	331	420	411	174	792	640	241	463	470
V/C Ratio(X)	0.87	0.76	0.14	0.92	0.73	0.74	0.85	0.82	0.20	0.31	0.91	0.91
Avail Cap(c_a), veh/h	284	831	517	349	480	471	202	1064	758	241	480	488
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	0.96	0.96	0.96	0.59	0.59	0.59	0.83	0.83	0.83
Uniform Delay (d), s/veh	51.7	47.5	9.3	47.9	42.2	42.2	53.2	44.3	22.6	51.8	53.3	53.3
Incr Delay (d2), s/veh	19.5	2.8	0.1	27.6	10.2	10.8	15.8	2.4	0.1	0.6	17.6	17.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.7	6.6	0.8	11.3	9.4	9.3	5.0	9.3	2.2	2.3	15.7	15.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	71.2	50.3	9.5	75.5	52.4	53.0	69.0	46.7	22.6	52.4	71.0	70.8
LnGrp LOS	E	D	A	E	D	D	E	D	C	D	E	E
Approach Vol, veh/h	705			914			926			921		
Approach Delay, s/veh	52.6			60.3			47.0			69.4		
Approach LOS	D			E			D			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	28.2	26.2	17.1	36.8	20.1	34.3	21.7	32.2				
Change Period (Y+Rc), s	5.7	* 5.7	5.3	5.3	5.3	5.7	5.3	5.3				
Max Green Setting (Gmax), s	28.3	* 28	13.7	32.7	19.3	32.7	10.2	36.2				
Max Q Clear Time (g_c+Q2), s	22.3	16.9	11.8	30.3	14.6	21.4	6.9	23.2				
Green Ext Time (p_c), s	0.1	2.3	0.1	1.2	0.2	2.7	0.0	3.8				

Intersection Summary

HCM 6th Ctrl Delay 57.6

HCM 6th LOS E

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary

5: Ridley Ave & Guerneville Rd

Lance Drive Residential TIA
Near Term Plus Project PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	690	40	74	847	20	20	10	57	20	10	20
Future Volume (veh/h)	20	690	40	74	847	20	20	10	57	20	10	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	22	742	42	80	911	22	22	11	10	22	11	0
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	567	3019	171	648	3130	76	80	30	20	97	39	0
Arrive On Green	0.89	0.89	0.89	0.89	0.89	0.89	0.05	0.05	0.05	0.05	0.05	0.00
Sat Flow, veh/h	595	3391	192	684	3516	85	665	569	374	908	740	0
Grp Volume(v), veh/h	22	386	398	80	457	476	43	0	0	33	0	0
Grp Sat Flow(s),veh/h/ln	595	1763	1820	684	1763	1838	1609	0	0	1648	0	0
Q Serve(g_s), s	0.7	3.7	3.7	2.2	4.6	4.6	0.8	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	5.3	3.7	3.7	5.9	4.6	4.6	2.9	0.0	0.0	2.1	0.0	0.0
Prop In Lane	1.00		0.11	1.00		0.05	0.51		0.23	0.67		0.00
Lane Grp Cap(c), veh/h	567	1569	1621	648	1569	1636	129	0	0	136	0	0
V/C Ratio(X)	0.04	0.25	0.25	0.12	0.29	0.29	0.33	0.00	0.00	0.24	0.00	0.00
Avail Cap(c_a), veh/h	567	1569	1621	648	1569	1636	468	0	0	471	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.90	0.90	0.90	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	1.4	0.9	0.9	1.3	1.0	1.0	55.2	0.0	0.0	54.9	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.3	0.3	0.0	0.0	0.0	0.6	0.0	0.0	0.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.3	0.3	0.1	0.2	0.2	1.3	0.0	0.0	1.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	1.5	1.3	1.3	1.4	1.0	1.0	55.8	0.0	0.0	55.2	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	E	A	A	E	A	A
Approach Vol, veh/h	806			1013			43			33		
Approach Delay, s/veh	1.3			1.0			55.8			55.2		
Approach LOS	A			A			E			E		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	110.7			9.3			110.7			9.3		
Change Period (Y+Rc), s	3.9			3.0			3.9			3.0		
Max Green Setting (Gmax), s	80.1			33.0			80.1			33.0		
Max Q Clear Time (g_c+I1), s	7.3			4.1			7.9			4.9		
Green Ext Time (p_c), s	1.6			0.1			2.1			0.1		

Intersection Summary

HCM 6th Ctrl Delay	3.3
HCM 6th LOS	A

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary 6: Lance Dr & Guerneville Rd

Lance Drive Residential TIA
Near Term Plus Project PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	108	603	20	60	910	228	10	43	40	131	48	66
Future Volume (veh/h)	108	603	20	60	910	228	10	43	40	131	48	66
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.99	0.99		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	112	628	20	62	948	221	10	45	5	136	50	57
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	138	697	22	297	1023	445	66	260	26	199	60	65
Arrive On Green	0.03	0.07	0.07	0.11	0.19	0.19	0.18	0.18	0.18	0.18	0.18	0.18
Sat Flow, veh/h	1767	3485	111	1767	3526	1535	170	1428	145	835	329	357
Grp Volume(v), veh/h	112	317	331	62	948	221	60	0	0	243	0	0
Grp Sat Flow(s), veh/h/ln	1767	1763	1833	1767	1763	1535	1744	0	0	1521	0	0
Q Serve(g_s), s	7.6	21.5	21.5	3.8	31.7	15.4	0.0	0.0	0.0	15.2	0.0	0.0
Cycle Q Clear(g_c), s	7.6	21.5	21.5	3.8	31.7	15.4	3.3	0.0	0.0	18.5	0.0	0.0
Prop In Lane	1.00		0.06	1.00		1.00	0.17		0.08	0.56		0.23
Lane Grp Cap(c), veh/h	138	353	366	297	1023	445	352	0	0	324	0	0
V/C Ratio(X)	0.81	0.90	0.90	0.21	0.93	0.50	0.17	0.00	0.00	0.75	0.00	0.00
Avail Cap(c_a), veh/h	202	848	881	297	1695	738	516	0	0	465	0	0
HCM Platoon Ratio	0.33	0.33	0.33	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.89	0.89	0.89	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	57.6	54.9	54.9	46.0	47.1	40.5	41.5	0.0	0.0	47.4	0.0	0.0
Incr Delay (d2), s/veh	9.3	3.4	3.4	0.1	14.0	3.5	0.1	0.0	0.0	2.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.8	10.5	10.9	1.7	16.2	6.5	1.5	0.0	0.0	7.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	66.9	58.3	58.2	46.1	61.1	44.0	41.6	0.0	0.0	49.4	0.0	0.0
LnGrp LOS	E	E	E	D	E	D	D	A	A	D	A	A
Approach Vol, veh/h	760			1231			60			243		
Approach Delay, s/veh	59.5			57.2			41.6			49.4		
Approach LOS	E			E			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	25.5	29.3		26.4	14.6	40.1		26.4				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		4.6				
Max Green Setting (Gmax), s	57.7	57.7		33.4	13.7	57.7		33.4				
Max Q Clear Time (g_c+15), s	23.5	23.5		20.5	9.6	33.7		5.3				
Green Ext Time (p_c), s	0.0	0.5		0.3	0.0	1.1		0.1				

Intersection Summary

HCM 6th Ctrl Delay 56.8

HCM 6th LOS E

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

7: N Dutton Ave/Westberry Dr & Guerneville Rd

Lance Drive Residential TIA
Near Term Plus Project PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	689	125	460	957	20	201	10	450	10	10	10
Future Volume (veh/h)	10	689	125	460	957	20	201	10	450	10	10	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.99	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	11	741	126	495	1029	21	224	0	133	11	11	7
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	27	789	134	1524	2444	50	280	0	823	28	28	18
Arrive On Green	0.02	0.26	0.26	0.89	1.00	1.00	0.08	0.00	0.08	0.04	0.04	0.04
Sat Flow, veh/h	1767	3003	510	3428	3531	72	3534	0	1561	658	658	419
Grp Volume(v), veh/h	11	435	432	495	514	536	224	0	133	29	0	0
Grp Sat Flow(s), veh/h/ln	1767	1763	1750	1714	1763	1840	1767	0	1561	1734	0	0
Q Serve(g_s), s	0.7	29.0	29.0	2.7	0.0	0.0	7.5	0.0	0.0	2.0	0.0	0.0
Cycle Q Clear(g_c), s	0.7	29.0	29.0	2.7	0.0	0.0	7.5	0.0	0.0	2.0	0.0	0.0
Prop In Lane	1.00		0.29	1.00		0.04	1.00		1.00	0.38		0.24
Lane Grp Cap(c), veh/h	27	463	460	1524	1220	1274	280	0	823	74	0	0
V/C Ratio(X)	0.41	0.94	0.94	0.32	0.42	0.42	0.80	0.00	0.16	0.39	0.00	0.00
Avail Cap(c_a), veh/h	88	535	531	1524	1220	1274	345	0	851	400	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.95	0.95	0.95	0.64	0.64	0.64	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	58.5	43.3	43.3	3.8	0.0	0.0	54.3	0.0	14.9	55.9	0.0	0.0
Incr Delay (d2), s/veh	3.4	28.0	28.2	0.0	0.7	0.7	8.4	0.0	0.0	1.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	15.9	15.8	0.8	0.2	0.2	3.6	0.0	1.8	0.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.9	71.2	71.5	3.9	0.7	0.7	62.7	0.0	14.9	57.2	0.0	0.0
LnGrp LOS	E	E	E	A	A	A	E	A	B	E	A	A
Approach Vol, veh/h	878			1545			357			29		
Approach Delay, s/veh	71.3			1.7			44.9			57.2		
Approach LOS	E			A			D			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	58.7	36.8		9.7	7.1	88.4		14.8				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		5.3				
Max Green Setting (Gmax), s	28.5	36.4		27.7	6.0	54.1		11.7				
Max Q Clear Time (g_c+14), s	14.3	31.0		4.0	2.7	2.0		9.5				
Green Ext Time (p_c), s	0.1	0.6		0.0	0.0	0.9		0.0				

Intersection Summary

HCM 6th Ctrl Delay 29.5

HCM 6th LOS C

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

8: Herbert St/Coffey Ln & Guerneville Rd

Lance Drive Residential TIA
Near Term Plus Project PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	181	908	60	50	1187	90	40	20	30	100	30	230
Future Volume (veh/h)	181	908	60	50	1187	90	40	20	30	100	30	230
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.99	1.00		0.93	1.00		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	197	987	61	54	1290	94	43	22	16	109	33	51
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	158	1019	63	566	1778	129	82	42	31	164	50	318
Arrive On Green	0.18	0.61	0.61	0.32	0.53	0.53	0.09	0.09	0.09	0.12	0.12	0.12
Sat Flow, veh/h	1767	3363	208	1767	3330	242	913	467	340	1372	415	1486
Grp Volume(v), veh/h	197	517	531	54	681	703	81	0	0	142	0	51
Grp Sat Flow(s), veh/h/ln	1767	1763	1808	1767	1763	1810	1719	0	0	1787	0	1486
Q Serve(g_s), s	10.7	33.6	33.6	2.6	35.2	35.5	5.4	0.0	0.0	9.1	0.0	3.4
Cycle Q Clear(g_c), s	10.7	33.6	33.6	2.6	35.2	35.5	5.4	0.0	0.0	9.1	0.0	3.4
Prop In Lane	1.00		0.11	1.00		0.13	0.53		0.20	0.77		1.00
Lane Grp Cap(c), veh/h	158	534	548	566	941	966	155	0	0	214	0	318
V/C Ratio(X)	1.25	0.97	0.97	0.10	0.72	0.73	0.52	0.00	0.00	0.66	0.00	0.16
Avail Cap(c_a), veh/h	158	623	639	566	941	966	358	0	0	387	0	462
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.83	0.83	0.83	0.76	0.76	0.76	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	49.3	23.1	23.1	28.6	21.3	21.3	52.2	0.0	0.0	50.5	0.0	38.9
Incr Delay (d2), s/veh	148.5	28.6	28.2	0.0	3.7	3.7	1.0	0.0	0.0	1.3	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	12.3	12.6	1.1	14.5	15.0	2.4	0.0	0.0	4.1	0.0	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	197.8	51.7	51.3	28.6	25.0	25.0	53.2	0.0	0.0	51.9	0.0	39.0
LnGrp LOS	F	D	D	C	C	C	D	A	A	D	A	D
Approach Vol, veh/h	1245			1438			81			193		
Approach Delay, s/veh	74.6			25.1			53.2			48.5		
Approach LOS	E			C			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	43.7	41.7		19.2	16.0	69.4		15.4				
Change Period (Y+Rc), s	5.3	5.3		4.9	5.3	5.3		4.6				
Max Green Setting (Gmax), s	6.5	42.4		26.0	10.7	38.2		25.0				
Max Q Clear Time (g_c+14), s	14.6	35.6		11.1	12.7	37.5		7.4				
Green Ext Time (p_c), s	0.0	0.7		0.1	0.0	0.2		0.1				
Intersection Summary												
HCM 6th Ctrl Delay	48.3											
HCM 6th LOS	D											

HCM 6th Signalized Intersection Summary

9: Range Ave & Guerneville Rd

Lance Drive Residential TIA
Near Term Plus Project PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	150	666	202	90	834	22	273	160	140	101	220	240
Future Volume (veh/h)	150	666	202	90	834	22	273	160	140	101	220	240
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	156	694	0	94	869	0	174	321	71	105	229	78
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	530	1751		117	926		277	460	100	194	282	92
Arrive On Green	0.60	0.99	0.00	0.07	0.26	0.00	0.16	0.16	0.16	0.04	0.04	0.04
Sat Flow, veh/h	1767	3618	0	1767	3618	0	1767	2937	639	1767	2568	843
Grp Volume(v), veh/h	156	694	0	94	869	0	174	201	191	105	155	152
Grp Sat Flow(s), veh/h/ln	1767	1763	0	1767	1763	0	1767	1856	1720	1767	1763	1648
Q Serve(g_s), s	5.1	0.3	0.0	6.3	28.9	0.0	11.1	12.3	12.7	7.0	10.4	11.0
Cycle Q Clear(g_c), s	5.1	0.3	0.0	6.3	28.9	0.0	11.1	12.3	12.7	7.0	10.4	11.0
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.37	1.00		0.51
Lane Grp Cap(c), veh/h	530	1751		117	926		277	291	270	194	193	181
V/C Ratio(X)	0.29	0.40		0.80	0.94		0.63	0.69	0.71	0.54	0.80	0.84
Avail Cap(c_a), veh/h	530	1751		143	1002		486	510	473	246	245	229
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	0.77	0.77	0.00	0.92	0.92	0.00	1.00	1.00	1.00	0.59	0.59	0.59
Uniform Delay (d), s/veh	17.8	0.2	0.0	55.3	43.3	0.0	47.3	47.8	48.0	54.9	56.5	56.8
Incr Delay (d2), s/veh	0.1	0.5	0.0	17.9	13.7	0.0	0.9	1.1	1.3	0.5	6.5	10.6
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	0.2	0.0	3.4	14.1	0.0	4.9	5.8	5.5	3.2	5.2	5.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.9	0.7	0.0	73.2	57.0	0.0	48.2	48.9	49.3	55.4	63.0	67.4
LnGrp LOS	B	A		E	E		D	D	D	E	E	E
Approach Vol, veh/h	850		A	963		A	566		412			
Approach Delay, s/veh	3.9			58.6			48.8		62.7			
Approach LOS	A			E			D		E			
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	3.2	64.9		18.5	41.3	36.8		23.4				
Change Period (Y+Rc), s	5.3	5.3		5.3	5.3	5.3		4.6				
Max Green Setting (Gmax), s	40.1	40.1		16.7	15.7	34.1		33.0				
Max Q Clear Time (g_c+1/3), s	2.3	2.3		13.0	7.1	30.9		14.7				
Green Ext Time (p_c), s	0.0	0.8		0.1	0.0	0.6		0.3				

Intersection Summary

HCM 6th Ctrl Delay 40.6
HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

10: Guerneville Rd & Steele Wy

Lance Drive Residential TIA
Near Term Plus Project PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	775	102	130	853	12	73	40	160	321	50	20
Future Volume (veh/h)	20	775	102	130	853	12	73	40	160	321	50	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	20	791	77	133	870	12	58	64	71	364	0	8
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	655	2023	1012	200	931	13	137	144	211	457	0	780
Arrive On Green	0.37	0.57	0.57	0.06	0.26	0.26	0.08	0.08	0.08	0.13	0.00	0.13
Sat Flow, veh/h	1767	3526	1550	3428	3560	49	1767	1856	1530	3534	0	1526
Grp Volume(v), veh/h	20	791	77	133	431	451	58	64	71	364	0	8
Grp Sat Flow(s), veh/h/ln	1767	1763	1550	1714	1763	1846	1767	1856	1530	1767	0	1526
Q Serve(g_s), s	0.9	14.8	2.2	4.6	28.7	28.7	3.8	4.0	5.0	12.0	0.0	0.0
Cycle Q Clear(g_c), s	0.9	14.8	2.2	4.6	28.7	28.7	3.8	4.0	5.0	12.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.03	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	655	2023	1012	200	461	483	137	144	211	457	0	780
V/C Ratio(X)	0.03	0.39	0.08	0.67	0.93	0.93	0.42	0.44	0.34	0.80	0.00	0.01
Avail Cap(c_a), veh/h	655	2023	1012	271	580	608	398	417	436	798	0	928
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.83	0.83	0.83	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	24.0	14.0	7.7	55.4	43.3	43.3	52.8	52.9	47.0	50.7	0.0	15.1
Incr Delay (d2), s/veh	0.0	0.5	0.1	1.4	18.1	17.5	0.8	0.8	0.3	1.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	5.8	0.9	2.0	14.6	15.2	1.7	1.9	1.9	5.4	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.0	14.5	7.8	56.8	61.4	60.8	53.5	53.7	47.3	51.9	0.0	15.1
LnGrp LOS	C	B	A	E	E	E	D	D	D	D	A	B
Approach Vol, veh/h	888			1015			193			372		
Approach Delay, s/veh	14.1			60.6			51.3			51.1		
Approach LOS	B			E			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	1.9	73.8		20.4	49.4	36.3		13.9				
Change Period (Y+Rc), s	4.9	4.9		4.9	4.9	4.9		4.6				
Max Green Setting (Gmax), s	27.5	37.1		27.1	7.1	39.5		27.0				
Max Q Clear Time (g_c+10), s	16.8	16.8		14.0	2.9	30.7		7.0				
Green Ext Time (p_c), s	0.0	1.0		0.1	0.0	0.7		0.1				

Intersection Summary

HCM 6th Ctrl Delay 41.7
HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.
User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

11: Cleveland Ave & Guerneville Rd

Lance Drive Residential TIA
Near Term Plus Project PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	←↑↑	↑↑↑		←↑↑	↑↑↑	↑	←	↑↑		←	↑↑	
Traffic Volume (veh/h)	110	1086	80	310	1295	200	90	130	230	410	340	120
Future Volume (veh/h)	110	1086	80	310	1295	200	90	130	230	410	340	120
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	115	1131	75	323	1349	142	94	135	46	296	538	106
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	196	1645	109	377	1384	604	328	482	157	356	604	118
Arrive On Green	0.06	0.34	0.34	0.07	0.26	0.26	0.19	0.19	0.19	0.20	0.20	0.20
Sat Flow, veh/h	3428	4844	321	3428	3526	1540	1767	2598	848	1767	2996	587
Grp Volume(v), veh/h	115	788	418	323	1349	142	94	90	91	296	332	312
Grp Sat Flow(s), veh/h/ln	1714	1689	1788	1714	1763	1540	1767	1763	1683	1767	1856	1728
Q Serve(g_s), s	3.9	24.1	24.2	11.2	45.5	8.7	5.5	5.2	5.6	19.3	20.9	21.1
Cycle Q Clear(g_c), s	3.9	24.1	24.2	11.2	45.5	8.7	5.5	5.2	5.6	19.3	20.9	21.1
Prop In Lane	1.00		0.18	1.00		1.00	1.00		0.50	1.00		0.34
Lane Grp Cap(c), veh/h	196	1146	607	377	1384	604	328	327	312	356	374	348
V/C Ratio(X)	0.59	0.69	0.69	0.86	0.97	0.23	0.29	0.27	0.29	0.83	0.89	0.90
Avail Cap(c_a), veh/h	203	1146	607	506	1384	604	328	327	312	443	465	433
HCM Platoon Ratio	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.50	0.50	0.50	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	55.2	34.1	34.2	54.6	43.6	30.1	42.0	41.9	42.1	46.0	46.6	46.7
Incr Delay (d2), s/veh	2.6	1.5	2.7	4.4	11.8	0.0	2.2	2.1	2.4	8.7	14.2	16.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	10.0	10.8	5.2	22.7	3.3	2.6	2.5	2.5	9.2	11.0	10.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.8	35.6	36.9	59.1	55.4	30.1	44.2	44.0	44.4	54.6	60.8	62.7
LnGrp LOS	E	D	D	E	E	C	D	D	D	D	E	E
Approach Vol, veh/h	1321			1814			275			940		
Approach Delay, s/veh	37.9			54.1			44.2			59.5		
Approach LOS	D			D			D			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	45.6			27.2	11.7	52.0		29.1				
Change Period (Y+Rc), s	4.9	4.9		4.9	4.9	4.9		4.9				
Max Green Setting (Gmax), s	36.5			16.1	7.1	47.1		30.1				
Max Q Clear Time (g_c+I1), s	26.2			7.6	5.9	47.5		23.1				
Green Ext Time (p_c), s	0.0	1.4		0.1	0.0	0.0		0.4				

Intersection Summary

HCM 6th Ctrl Delay 49.7

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 12: US 101 SB Ramps & Guerneville Rd

Lance Drive Residential TIA
Near Term Plus Project PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑					↑	↑	↑
Traffic Volume (veh/h)	0	1179	567	300	1412	0	0	0	0	290	70	393
Future Volume (veh/h)	0	1179	567	300	1412	0	0	0	0	290	70	393
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1856	1856	1856	1856	0				1856	1856	1856
Adj Flow Rate, veh/h	0	1215	194	309	1456	0				186	231	371
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	1457	436	362	1530	0				860	903	766
Arrive On Green	0.00	0.29	0.29	0.11	0.43	0.00				0.49	0.49	0.49
Sat Flow, veh/h	0	5233	1515	3428	3618	0				1767	1856	1572
Grp Volume(v), veh/h	0	1215	194	309	1456	0				186	231	371
Grp Sat Flow(s),veh/h/ln	0	1689	1515	1714	1763	0				1767	1856	1572
Q Serve(g_s), s	0.0	27.0	12.6	10.6	47.8	0.0				7.2	8.8	19.0
Cycle Q Clear(g_c), s	0.0	27.0	12.6	10.6	47.8	0.0				7.2	8.8	19.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1457	436	362	1530	0				860	903	766
V/C Ratio(X)	0.00	0.83	0.45	0.85	0.95	0.00				0.22	0.26	0.48
Avail Cap(c_a), veh/h	0	1988	595	546	2089	0				860	903	766
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.56	0.56	0.72	0.72	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	40.1	34.9	52.8	32.7	0.0				17.7	18.0	20.7
Incr Delay (d2), s/veh	0.0	1.0	0.1	4.0	5.8	0.0				0.6	0.7	2.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	11.1	4.6	4.7	20.8	0.0				2.9	3.7	7.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	41.0	35.1	56.7	38.6	0.0				18.2	18.7	22.9
LnGrp LOS	A	D	D	E	D	A				B	B	C
Approach Vol, veh/h		1409			1765						788	
Approach Delay, s/veh		40.2			41.7						20.6	
Approach LOS		D			D						C	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	7.6	39.4		63.0		57.0						
Change Period (Y+Rc), s	4.9	4.9		4.6		4.9						
Max Green Setting (Gmax), s	47.1			39.4		71.1						
Max Q Clear Time (g_c+I1), s	29.0			21.0		49.8						
Green Ext Time (p_c), s	0.0	1.8		0.2		2.3						

Intersection Summary

HCM 6th Ctrl Delay	37.0
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 13: US 101 NB Ramps & Guerneville Rd/Steele Ln

Lance Drive Residential TIA
Near Term Plus Project PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↰↱			↰↱↰↱		↰	↰↱	↰			
Traffic Volume (veh/h)	441	1038	0	0	1013	240	699	10	330	0	0	0
Future Volume (veh/h)	441	1038	0	0	1013	240	699	10	330	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1856	1856	0	0	1856	1856	1856	1856	1856			
Adj Flow Rate, veh/h	459	1081	0	0	1055	223	818	0	188			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	3	3	0	0	3	3	3	3	3			
Cap, veh/h	1233	2383	0	0	1148	242	866	0	385			
Arrive On Green	0.72	1.00	0.00	0.00	0.28	0.28	0.25	0.00	0.25			
Sat Flow, veh/h	3428	3618	0	0	4337	880	3534	0	1572			
Grp Volume(v), veh/h	459	1081	0	0	854	424	818	0	188			
Grp Sat Flow(s),veh/h/ln	1714	1763	0	0	1689	1673	1767	0	1572			
Q Serve(g_s), s	6.2	0.0	0.0	0.0	29.4	29.5	27.3	0.0	12.3			
Cycle Q Clear(g_c), s	6.2	0.0	0.0	0.0	29.4	29.5	27.3	0.0	12.3			
Prop In Lane	1.00		0.00	0.00		0.53	1.00		1.00			
Lane Grp Cap(c), veh/h	1233	2383	0	0	930	460	866	0	385			
V/C Ratio(X)	0.37	0.45	0.00	0.00	0.92	0.92	0.94	0.00	0.49			
Avail Cap(c_a), veh/h	1233	2383	0	0	1174	581	1249	0	556			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.68	0.68	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	11.6	0.0	0.0	0.0	42.2	42.2	44.5	0.0	38.8			
Incr Delay (d2), s/veh	0.0	0.4	0.0	0.0	8.8	15.7	9.4	0.0	0.4			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	2.0	0.1	0.0	0.0	13.2	14.0	12.6	0.0	4.6			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.7	0.4	0.0	0.0	51.0	57.9	53.9	0.0	39.2			
LnGrp LOS	B	A	A	A	D	E	D	A	D			
Approach Vol, veh/h	1540			1278			1006					
Approach Delay, s/veh	3.8			53.3			51.2					
Approach LOS	A			D			D					
Timer - Assigned Phs	2			5			6			8		
Phs Duration (G+Y+Rc), s	86.0			48.1			37.9			34.0		
Change Period (Y+Rc), s	4.9			4.9			4.9			4.6		
Max Green Setting (Gmax), s	68.1			21.5			41.7			42.4		
Max Q Clear Time (g_c+I1), s	2.0			8.2			31.5			29.3		
Green Ext Time (p_c), s	1.6			0.1			1.5			0.1		

Intersection Summary

HCM 6th Ctrl Delay	32.8
HCM 6th LOS	C










Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 14: Stony Point Rd/Marlow Rd & W College Ave

Lance Drive Residential TIA
Near Term Plus Project PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	93	260	110	224	370	210	160	770	266	170	832	128
Future Volume (veh/h)	93	260	110	224	370	210	160	770	266	170	832	128
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No				No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	98	274	76	236	389	155	168	811	157	179	876	126
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	386	346	94	461	417	164	197	972	836	283	1000	144
Arrive On Green	0.22	0.13	0.13	0.26	0.17	0.17	0.11	0.28	0.28	0.16	0.32	0.32
Sat Flow, veh/h	1767	2727	740	1767	2459	966	1767	3526	1544	1767	3086	444
Grp Volume(v), veh/h	98	175	175	236	277	267	168	811	157	179	500	502
Grp Sat Flow(s),veh/h/ln	1767	1763	1704	1767	1763	1662	1767	1763	1544	1767	1763	1767
Q Serve(g_s), s	5.5	11.5	12.0	13.7	18.6	19.1	11.2	26.0	2.3	11.4	32.2	32.2
Cycle Q Clear(g_c), s	5.5	11.5	12.0	13.7	18.6	19.1	11.2	26.0	2.3	11.4	32.2	32.2
Prop In Lane	1.00		0.43	1.00		0.58	1.00		1.00	1.00		0.25
Lane Grp Cap(c), veh/h	386	223	216	461	299	282	197	972	836	283	571	572
V/C Ratio(X)	0.25	0.78	0.81	0.51	0.93	0.95	0.85	0.83	0.19	0.63	0.88	0.88
Avail Cap(c_a), veh/h	386	289	280	461	299	282	305	1254	960	349	671	673
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.37	0.37	0.37	1.00	1.00	1.00	0.45	0.45	0.45
Uniform Delay (d), s/veh	38.8	50.8	51.0	37.8	49.1	49.3	52.3	40.9	4.7	47.1	38.3	38.3
Incr Delay (d2), s/veh	0.3	10.0	12.8	0.4	16.9	20.8	13.0	3.9	0.1	1.2	5.5	5.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	5.6	5.8	5.8	9.4	9.4	5.6	11.5	0.9	5.0	14.3	14.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.2	60.8	63.7	38.2	66.0	70.2	65.4	44.8	4.8	48.3	43.8	43.8
LnGrp LOS	D	E	E	D	E	E	E	D	A	D	D	D
Approach Vol, veh/h	448		780				1136			1181		
Approach Delay, s/veh	57.2		59.0				42.3			44.5		
Approach LOS	E		E				D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	36.6	20.5	18.7	44.2	31.5	25.6	24.5	38.4				
Change Period (Y+Rc), s	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3				
Max Green Setting (Gmax), s	42.7	19.7	20.7	45.7	12.7	19.7	23.7	42.7				
Max Q Clear Time (g_c+I1), s	11.5	14.0	13.2	34.2	7.5	21.1	13.4	28.0				
Green Ext Time (p_c), s	0.0	0.9	0.2	4.7	0.1	0.0	0.3	5.1				

Intersection Summary

HCM 6th Ctrl Delay 48.6

HCM 6th LOS D

Notes









User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

15: N Dutton Ave & W College Ave

Lance Drive Residential TIA
Near Term Plus Project PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	600	110	180	810	193	160	356	130	315	506	150
Future Volume (veh/h)	90	600	110	180	810	193	160	356	130	315	506	150
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	94	625	103	188	844	186	167	371	100	328	527	130
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	117	683	112	257	896	197	480	440	117	610	653	160
Arrive On Green	0.07	0.23	0.23	0.15	0.31	0.31	0.27	0.16	0.16	0.35	0.23	0.23
Sat Flow, veh/h	1767	3022	497	1767	2862	631	1767	2741	729	1767	2793	686
Grp Volume(v), veh/h	94	364	364	188	520	510	167	237	234	328	332	325
Grp Sat Flow(s),veh/h/ln	1767	1763	1756	1767	1763	1730	1767	1763	1706	1767	1763	1716
Q Serve(g_s), s	6.3	24.2	24.3	12.2	34.5	34.5	9.1	15.6	16.0	17.9	21.3	21.5
Cycle Q Clear(g_c), s	6.3	24.2	24.3	12.2	34.5	34.5	9.1	15.6	16.0	17.9	21.3	21.5
Prop In Lane	1.00		0.28	1.00		0.36	1.00		0.43	1.00		0.40
Lane Grp Cap(c), veh/h	117	399	397	257	552	542	480	283	274	610	412	401
V/C Ratio(X)	0.80	0.91	0.92	0.73	0.94	0.94	0.35	0.84	0.86	0.54	0.80	0.81
Avail Cap(c_a), veh/h	147	457	455	280	589	578	480	457	442	610	516	502
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.81	0.81	0.81	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	55.3	45.3	45.3	49.0	40.2	40.2	35.1	48.8	49.0	31.6	43.4	43.4
Incr Delay (d2), s/veh	14.7	16.9	17.4	7.1	22.3	22.7	0.2	3.5	4.9	0.5	5.8	6.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.3	12.3	12.3	5.8	18.0	17.7	3.9	7.1	7.1	7.5	9.7	9.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	69.9	62.1	62.7	56.1	62.5	62.8	35.3	52.4	53.9	32.1	49.1	49.8
LnGrp LOS	E	E	E	E	E	E	D	D	D	C	D	D
Approach Vol, veh/h	822				1218				638		985	
Approach Delay, s/veh	63.3				61.7				48.5		43.7	
Approach LOS	E				E				D		D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	31.4	31.0	35.6	32.0	10.9	41.5	44.4	23.2				
Change Period (Y+Rc), s	3.9	* 3.9	3.0	3.9	3.0	3.9	3.0	3.9				
Max Green Setting (Gmax), s	31.0	* 31	21.0	35.1	10.0	40.1	25.0	31.1				
Max Q Clear Time (g_c+14.2), s	26.3	26.3	11.1	23.5	8.3	36.5	19.9	18.0				
Green Ext Time (p_c), s	0.0	0.9	0.0	1.1	0.0	1.1	0.1	0.8				

Intersection Summary

HCM 6th Ctrl Delay 54.9

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Intersection Delay, s/veh	8.8
Intersection LOS	A




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	7	50	0	62	78	99	0	6	36	85	7	13
Future Vol, veh/h	7	50	0	62	78	99	0	6	36	85	7	13
Peak Hour Factor	0.86	0.86	0.92	0.92	0.86	0.86	0.92	0.92	0.92	0.86	0.92	0.86
Heavy Vehicles, %	3	3	2	2	3	3	2	2	2	3	2	3
Mvmt Flow	8	58	0	67	91	115	0	7	39	99	8	15
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.1	9.2	7.6	8.8
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	12%	26%	81%
Vol Thru, %	14%	88%	33%	7%
Vol Right, %	86%	0%	41%	12%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	42	57	239	105
LT Vol	0	7	62	85
Through Vol	6	50	78	7
RT Vol	36	0	99	13
Lane Flow Rate	46	66	273	122
Geometry Grp	1	1	1	1
Degree of Util (X)	0.055	0.086	0.32	0.164
Departure Headway (Hd)	4.33	4.669	4.218	4.846
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	826	767	852	740
Service Time	2.362	2.699	2.24	2.873
HCM Lane V/C Ratio	0.056	0.086	0.32	0.165
HCM Control Delay	7.6	8.1	9.2	8.8
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.2	0.3	1.4	0.6




HCM 6th TWSC
17: Iroquois St & Project Driveway (1)

Lance Drive Residential TIA
Near Term Plus Project PM (120 Seconds)

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	5	8	97	96	3
Future Vol, veh/h	1	5	8	97	96	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	5	9	105	104	3
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	229	106	107	0	-	0
Stage 1	106	-	-	-	-	-
Stage 2	123	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	759	948	1484	-	-	-
Stage 1	918	-	-	-	-	-
Stage 2	902	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	754	948	1484	-	-	-
Mov Cap-2 Maneuver	754	-	-	-	-	-
Stage 1	912	-	-	-	-	-
Stage 2	902	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	9	0.6		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1484	-	909	-	-	
HCM Lane V/C Ratio	0.006	-	0.007	-	-	
HCM Control Delay (s)	7.4	0	9	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	




HCM 6th TWSC
18: Iroquois St & Project Driveway (2)

Lance Drive Residential TIA
Near Term Plus Project PM (120 Seconds)

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	6	9	103	99	2
Future Vol, veh/h	2	6	9	103	99	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	7	10	112	108	2
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	241	109	110	0	-	0
Stage 1	109	-	-	-	-	-
Stage 2	132	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	747	945	1480	-	-	-
Stage 1	916	-	-	-	-	-
Stage 2	894	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	742	945	1480	-	-	-
Mov Cap-2 Maneuver	742	-	-	-	-	-
Stage 1	910	-	-	-	-	-
Stage 2	894	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	9.1	0.6		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1480	-	885	-	-	
HCM Lane V/C Ratio	0.007	-	0.01	-	-	
HCM Control Delay (s)	7.4	0	9.1	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	




HCM 6th TWSC
19: Project Driveway (3) & Lance Dr

Lance Drive Residential TIA
Near Term Plus Project PM (120 Seconds)

Intersection						
Int Delay, s/veh	1.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	168	3	43	236	3	27
Future Vol, veh/h	168	3	43	236	3	27
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	183	3	47	257	3	29
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	186	0	536	185
Stage 1	-	-	-	-	185	-
Stage 2	-	-	-	-	351	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1388	-	505	857
Stage 1	-	-	-	-	847	-
Stage 2	-	-	-	-	713	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1388	-	485	857
Mov Cap-2 Maneuver	-	-	-	-	485	-
Stage 1	-	-	-	-	847	-
Stage 2	-	-	-	-	685	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		1.2		9.7	
HCM LOS					A	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	796	-	-	1388	-	
HCM Lane V/C Ratio	0.041	-	-	0.034	-	
HCM Control Delay (s)	9.7	-	-	7.7	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0.1	-	-	0.1	-	

HCM 6th TWSC
20: Guerneville Rd & Project Driveway (4)























Lance Drive Residential TIA
Near Term Plus Project PM (120 Seconds)

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	9	708	956	20	13	5
Future Vol, veh/h	9	708	956	20	13	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	770	1039	22	14	5
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	1061	0	-	0	1455	531
Stage 1	-	-	-	-	1050	-
Stage 2	-	-	-	-	405	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	652	-	-	-	121	493
Stage 1	-	-	-	-	298	-
Stage 2	-	-	-	-	642	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	652	-	-	-	118	493
Mov Cap-2 Maneuver	-	-	-	-	118	-
Stage 1	-	-	-	-	290	-
Stage 2	-	-	-	-	642	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.2	0		32.6		
HCM LOS				D		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	652	-	-	-	150	
HCM Lane V/C Ratio	0.015	-	-	-	0.13	
HCM Control Delay (s)	10.6	0.1	-	-	32.6	
HCM Lane LOS	B	A	-	-	D	
HCM 95th %tile Q(veh)	0	-	-	-	0.4	

HCM 6th Signalized Intersection Summary







1: Marlow Rd & Marlow Ct/W Steele Ln

Lance Drive Residential TIA
Near Term Plus Project PM (120-140 Seconds)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	0	10	170	10	158	10	651	170	132	741	10
Future Volume (veh/h)	10	0	10	170	10	158	10	651	170	132	741	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.96	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	11	0	0	187	0	97	11	685	118	139	780	10
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	64	0	0	1794	0	941	22	805	1144	163	1099	14
Arrive On Green	0.04	0.00	0.00	0.51	0.00	0.51	0.01	0.23	0.23	0.09	0.31	0.31
Sat Flow, veh/h	1767	0	0	3534	0	1568	1767	3526	1517	1767	3563	46
Grp Volume(v), veh/h	11	0	0	187	0	97	11	685	118	139	386	404
Grp Sat Flow(s),veh/h/ln	1767	0	0	1767	0	1568	1767	1763	1517	1767	1763	1846
Q Serve(g_s), s	0.8	0.0	0.0	3.9	0.0	0.0	0.9	26.1	3.1	10.8	27.1	27.1
Cycle Q Clear(g_c), s	0.8	0.0	0.0	3.9	0.0	0.0	0.9	26.1	3.1	10.8	27.1	27.1
Prop In Lane	1.00		0.00	1.00		1.00	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	64	0	0	1794	0	941	22	805	1144	163	544	569
V/C Ratio(X)	0.17	0.00	0.00	0.10	0.00	0.10	0.50	0.85	0.10	0.85	0.71	0.71
Avail Cap(c_a), veh/h	379	0	0	1794	0	941	64	1010	1233	228	669	700
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.66	0.66	0.66	1.00	1.00	1.00
Uniform Delay (d), s/veh	65.5	0.0	0.0	17.9	0.0	11.9	68.7	51.7	5.3	62.6	42.9	42.9
Incr Delay (d2), s/veh	1.3	0.0	0.0	0.1	0.0	0.2	11.2	3.9	0.0	19.0	2.7	2.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	1.6	0.0	1.3	0.5	11.9	3.4	5.7	12.2	12.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	66.7	0.0	0.0	18.0	0.0	12.2	79.9	55.7	5.3	81.6	45.5	45.4
LnGrp LOS	E	A	A	B	A	B	E	E	A	F	D	D
Approach Vol, veh/h		11			284			814			929	
Approach Delay, s/veh		66.7			16.0			48.7			50.9	
Approach LOS		E			B			D			D	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		75.7	6.6	48.1		9.6	17.8	36.9				
Change Period (Y+Rc), s		4.6	4.9	4.9		4.6	4.9	4.9				
Max Green Setting (Gmax), s		32.8	5.1	53.1		30.0	18.1	40.1				
Max Q Clear Time (g_c+I1), s		5.9	2.9	29.1		2.8	12.8	28.1				
Green Ext Time (p_c), s		1.0	0.0	5.0		0.0	0.1	3.9				
Intersection Summary												
HCM 6th Ctrl Delay			45.2									
HCM 6th LOS			D									
Notes												
User approved pedestrian interval to be less than phase max green.												
User approved volume balancing among the lanes for turning movement.												

HCM 6th TWSC
2: Iroquois St/Apple Valley Ln & W Steele Ln






















Lance Drive Residential TIA
Near Term Plus Project PM (120-140 Seconds)

Intersection												
Int Delay, s/veh	4.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	30	300	54	55	460	40	49	10	29	30	10	30
Future Vol, veh/h	30	300	54	55	460	40	49	10	29	30	10	30
Conflicting Peds, #/hr	9	0	9	9	0	9	1	0	2	2	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	60	-	-	80	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	32	316	57	58	484	42	52	11	31	32	11	32
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	535	0	0	382	0	0	1062	1069	356	1062	1076	515
Stage 1	-	-	-	-	-	-	418	418	-	630	630	-
Stage 2	-	-	-	-	-	-	644	651	-	432	446	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1028	-	-	1171	-	-	200	220	686	200	218	558
Stage 1	-	-	-	-	-	-	610	589	-	468	473	-
Stage 2	-	-	-	-	-	-	460	463	-	600	572	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1019	-	-	1161	-	-	168	199	679	170	197	553
Mov Cap-2 Maneuver	-	-	-	-	-	-	168	199	-	170	197	-
Stage 1	-	-	-	-	-	-	586	565	-	449	445	-
Stage 2	-	-	-	-	-	-	402	436	-	544	549	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.7			0.8			31			25.4		
HCM LOS							D			D		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	229	1019	-	-	1161	-	-	249				
HCM Lane V/C Ratio	0.405	0.031	-	-	0.05	-	-	0.296				
HCM Control Delay (s)	31	8.6	-	-	8.3	-	-	25.4				
HCM Lane LOS	D	A	-	-	A	-	-	D				
HCM 95th %tile Q(veh)	1.8	0.1	-	-	0.2	-	-	1.2				

HCM 6th Signalized Intersection Summary

3: Range Ave & W Steele Ln

Lance Drive Residential TIA
Near Term Plus Project PM (120-140 Seconds)











												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	321	81	60	442	50	92	200	40	60	420	50
Future Volume (veh/h)	40	321	81	60	442	50	92	200	40	60	420	50
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		1.00	1.00		0.92
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	42	334	5	62	460	33	96	208	0	62	438	45
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	584	1282	19	708	1203	86	117	421	0	169	497	51
Arrive On Green	0.70	0.70	0.70	0.70	0.70	0.70	0.07	0.12	0.00	0.10	0.16	0.16
Sat Flow, veh/h	896	1823	27	1031	1710	123	1767	3618	0	1767	3199	326
Grp Volume(v), veh/h	42	0	339	62	0	493	96	208	0	62	240	243
Grp Sat Flow(s),veh/h/ln	896	0	1850	1031	0	1833	1767	1763	0	1767	1763	1763
Q Serve(g_s), s	2.8	0.0	9.3	3.3	0.0	15.3	7.5	7.7	0.0	4.6	18.6	18.9
Cycle Q Clear(g_c), s	18.1	0.0	9.3	12.6	0.0	15.3	7.5	7.7	0.0	4.6	18.6	18.9
Prop In Lane	1.00		0.01	1.00		0.07	1.00		0.00	1.00		0.19
Lane Grp Cap(c), veh/h	584	0	1301	708	0	1289	117	421	0	169	274	274
V/C Ratio(X)	0.07	0.00	0.26	0.09	0.00	0.38	0.82	0.49	0.00	0.37	0.88	0.89
Avail Cap(c_a), veh/h	584	0	1301	708	0	1289	215	1035	0	177	480	480
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.54	0.54	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.1	0.0	7.5	9.8	0.0	8.4	64.5	57.7	0.0	59.3	57.8	57.9
Incr Delay (d2), s/veh	0.2	0.0	0.5	0.2	0.0	0.9	2.9	0.2	0.0	0.5	3.5	4.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	3.7	0.8	0.0	6.0	3.4	3.4	0.0	2.1	8.5	8.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.3	0.0	8.0	10.1	0.0	9.3	67.4	57.9	0.0	59.8	61.4	62.4
LnGrp LOS	B	A	A	B	A	A	E	E	A	E	E	E
Approach Vol, veh/h		381			555			304			545	
Approach Delay, s/veh		8.5			9.4			60.9			61.6	
Approach LOS		A			A			E			E	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		102.1	12.3	25.6		102.1	17.3	20.6				
Change Period (Y+Rc), s		3.6	3.0	3.9		3.6	3.9	* 3.9				
Max Green Setting (Gmax), s		74.4	17.0	38.1		74.4	14.0	* 41				
Max Q Clear Time (g_c+I1), s		20.1	9.5	20.9		17.3	6.6	9.7				
Green Ext Time (p_c), s		0.7	0.0	0.8		1.1	0.0	0.4				
Intersection Summary												
HCM 6th Ctrl Delay			33.9									
HCM 6th LOS			C									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

HCM 6th Signalized Intersection Summary

4: Marlow Rd & Guerneville Rd

Lance Drive Residential TIA
Near Term Plus Project PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	180	436	130	290	476	121	140	620	203	71	730	80
Future Volume (veh/h)	180	436	130	290	476	121	140	620	203	71	730	80
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	189	459	80	305	501	107	147	653	134	75	768	78
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	218	602	417	331	687	146	173	792	640	240	847	86
Arrive On Green	0.12	0.17	0.17	0.19	0.24	0.24	0.10	0.22	0.22	0.14	0.26	0.26
Sat Flow, veh/h	1767	3526	1535	1767	2880	612	1767	3526	1537	1767	3224	327
Grp Volume(v), veh/h	189	459	80	305	305	303	147	653	134	75	420	426
Grp Sat Flow(s),veh/h/ln	1767	1763	1535	1767	1763	1729	1767	1763	1537	1767	1763	1789
Q Serve(g_s), s	12.6	14.9	2.0	20.3	19.2	19.4	9.8	21.1	0.0	4.6	27.6	27.7
Cycle Q Clear(g_c), s	12.6	14.9	2.0	20.3	19.2	19.4	9.8	21.1	0.0	4.6	27.6	27.7
Prop In Lane	1.00		1.00	1.00		0.35	1.00		1.00	1.00		0.18
Lane Grp Cap(c), veh/h	218	602	417	331	420	412	173	792	640	240	463	470
V/C Ratio(X)	0.87	0.76	0.19	0.92	0.73	0.73	0.85	0.82	0.21	0.31	0.91	0.91
Avail Cap(c_a), veh/h	284	831	516	349	480	471	188	1064	758	240	494	501
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.96	0.96	0.96	0.53	0.53	0.53	0.79	0.79	0.79
Uniform Delay (d), s/veh	51.7	47.4	9.4	47.9	42.1	42.2	53.2	44.3	22.7	46.8	42.8	42.8
Incr Delay (d2), s/veh	19.5	2.8	0.2	27.6	10.1	10.6	16.3	2.2	0.1	0.6	16.4	16.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.7	6.6	1.1	11.3	9.3	9.3	5.1	9.3	2.4	2.0	13.9	14.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	71.2	50.2	9.7	75.5	52.2	52.8	69.5	46.4	22.8	47.3	59.2	59.1
LnGrp LOS	E	D	A	E	D	D	E	D	C	D	E	E
Approach Vol, veh/h	728			913			934			921		
Approach Delay, s/veh	51.2			60.2			46.7			58.2		
Approach LOS	D			E			D			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	28.2	26.2	17.1	36.8	20.1	34.3	21.6	32.3				
Change Period (Y+Rc), s	5.7	* 5.7	5.3	5.3	5.3	5.7	5.3	5.3				
Max Green Setting (Gmax), s	28.2	* 28	12.8	33.6	19.3	32.7	10.2	36.2				
Max Q Clear Time (g_c+Q), s	22.3	16.9	11.8	29.7	14.6	21.4	6.6	23.1				
Green Ext Time (p_c), s	0.1	2.4	0.0	1.9	0.2	2.7	0.0	3.8				

Intersection Summary

HCM 6th Ctrl Delay 54.2

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary

5: Ridley Ave & Guerneville Rd

Lance Drive Residential TIA
Near Term Plus Project PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	690	40	74	847	20	20	10	57	20	10	20
Future Volume (veh/h)	20	690	40	74	847	20	20	10	57	20	10	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	0.99		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	22	742	42	80	911	22	22	11	10	22	11	0
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	589	3065	173	651	3178	77	71	26	18	86	35	0
Arrive On Green	0.90	0.90	0.90	1.00	1.00	1.00	0.05	0.05	0.05	0.05	0.05	0.00
Sat Flow, veh/h	595	3391	192	684	3516	85	690	554	377	925	738	0
Grp Volume(v), veh/h	22	386	398	80	457	476	43	0	0	33	0	0
Grp Sat Flow(s),veh/h/ln	595	1763	1820	684	1763	1838	1621	0	0	1663	0	0
Q Serve(g_s), s	0.5	3.8	3.8	0.6	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.5	3.8	3.8	4.3	0.0	0.0	3.4	0.0	0.0	2.5	0.0	0.0
Prop In Lane	1.00		0.11	1.00		0.05	0.51		0.23	0.67		0.00
Lane Grp Cap(c), veh/h	589	1593	1646	651	1593	1661	115	0	0	121	0	0
V/C Ratio(X)	0.04	0.24	0.24	0.12	0.29	0.29	0.37	0.00	0.00	0.27	0.00	0.00
Avail Cap(c_a), veh/h	589	1593	1646	651	1593	1661	423	0	0	426	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.90	0.90	0.90	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.7	0.8	0.8	0.1	0.0	0.0	65.2	0.0	0.0	64.8	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.3	0.3	0.0	0.0	0.0	0.7	0.0	0.0	0.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.3	0.4	0.0	0.0	0.0	1.5	0.0	0.0	1.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.8	1.2	1.1	0.1	0.0	0.0	65.9	0.0	0.0	65.2	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	E	A	A	E	A	A
Approach Vol, veh/h	806			1013			43			33		
Approach Delay, s/veh	1.1			0.0			65.9			65.2		
Approach LOS	A			A			E			E		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	130.4			9.6			130.4			9.6		
Change Period (Y+Rc), s	3.9			3.0			3.9			3.0		
Max Green Setting (Gmax), s	98.1			35.0			98.1			35.0		
Max Q Clear Time (g_c+I1), s	5.8			4.5			6.3			5.4		
Green Ext Time (p_c), s	1.6			0.1			2.1			0.1		

Intersection Summary

HCM 6th Ctrl Delay	3.1
HCM 6th LOS	A

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

6: Lance Dr & Guerneville Rd

Lance Drive Residential TIA
Near Term Plus Project PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	108	603	20	60	910	228	10	43	40	131	48	66
Future Volume (veh/h)	108	603	20	60	910	228	10	43	40	131	48	66
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.99	0.99		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	112	628	20	62	948	221	10	45	5	136	50	57
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	133	668	21	301	1012	441	61	248	25	190	56	63
Arrive On Green	0.15	0.38	0.38	0.11	0.19	0.19	0.18	0.18	0.18	0.18	0.18	0.18
Sat Flow, veh/h	1767	3485	111	1767	3526	1535	178	1405	144	847	319	357
Grp Volume(v), veh/h	112	317	331	62	948	221	60	0	0	243	0	0
Grp Sat Flow(s), veh/h/ln	1767	1763	1833	1767	1763	1535	1726	0	0	1523	0	0
Q Serve(g_s), s	8.6	24.3	24.3	4.5	37.1	18.0	0.0	0.0	0.0	17.9	0.0	0.0
Cycle Q Clear(g_c), s	8.6	24.3	24.3	4.5	37.1	18.0	3.9	0.0	0.0	21.8	0.0	0.0
Prop In Lane	1.00		0.06	1.00		1.00	0.17		0.08	0.56		0.23
Lane Grp Cap(c), veh/h	133	338	351	301	1012	441	335	0	0	309	0	0
V/C Ratio(X)	0.84	0.94	0.94	0.21	0.94	0.50	0.18	0.00	0.00	0.79	0.00	0.00
Avail Cap(c_a), veh/h	211	903	939	301	1806	786	477	0	0	432	0	0
HCM Platoon Ratio	2.00	2.00	2.00	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.89	0.89	0.89	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	58.7	42.4	42.4	53.4	55.3	47.6	49.0	0.0	0.0	56.1	0.0	0.0
Incr Delay (d2), s/veh	9.0	5.5	5.4	0.1	15.3	3.6	0.1	0.0	0.0	4.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	9.1	9.5	2.0	19.0	7.6	1.8	0.0	0.0	8.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	67.7	47.8	47.8	53.5	70.6	51.2	49.1	0.0	0.0	60.1	0.0	0.0
LnGrp LOS	E	D	D	D	E	D	D	A	A	E	A	A
Approach Vol, veh/h	760			1231			60			243		
Approach Delay, s/veh	50.7			66.2			49.1			60.1		
Approach LOS	D			E			D			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	29.1	32.1		29.4	15.8	45.5		29.4				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		4.6				
Max Green Setting (Gmax), s	66.3	71.7		36.4	16.7	71.7		36.4				
Max Q Clear Time (g_c+10), s	16.5	26.3		23.8	10.6	39.1		5.9				
Green Ext Time (p_c), s	0.0	0.5		0.3	0.0	1.1		0.1				

Intersection Summary

HCM 6th Ctrl Delay 60.0

HCM 6th LOS E

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

7: N Dutton Ave/Westberry Dr & Guerneville Rd

Lance Drive Residential TIA
Near Term Plus Project PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	689	125	460	957	20	201	10	450	10	10	10
Future Volume (veh/h)	10	689	125	460	957	20	201	10	450	10	10	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.99	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	11	741	126	495	1029	21	224	0	133	11	11	1
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	26	784	133	1644	2563	52	272	0	874	31	31	3
Arrive On Green	0.01	0.26	0.26	0.96	1.00	1.00	0.08	0.00	0.08	0.04	0.04	0.04
Sat Flow, veh/h	1767	3003	510	3428	3531	72	3534	0	1560	859	859	78
Grp Volume(v), veh/h	11	435	432	495	514	536	224	0	133	23	0	0
Grp Sat Flow(s), veh/h/ln	1767	1763	1750	1714	1763	1840	1767	0	1560	1796	0	0
Q Serve(g_s), s	0.9	33.9	33.9	1.2	0.0	0.0	8.7	0.0	0.0	1.8	0.0	0.0
Cycle Q Clear(g_c), s	0.9	33.9	33.9	1.2	0.0	0.0	8.7	0.0	0.0	1.8	0.0	0.0
Prop In Lane	1.00		0.29	1.00		0.04	1.00		1.00	0.48		0.04
Lane Grp Cap(c), veh/h	26	460	457	1644	1279	1336	272	0	874	64	0	0
V/C Ratio(X)	0.42	0.94	0.95	0.30	0.40	0.40	0.82	0.00	0.15	0.36	0.00	0.00
Avail Cap(c_a), veh/h	77	559	555	1644	1279	1336	371	0	918	355	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.95	0.95	0.95	0.66	0.66	0.66	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	68.4	50.7	50.7	1.5	0.0	0.0	63.7	0.0	15.0	65.9	0.0	0.0
Incr Delay (d2), s/veh	3.7	29.2	29.4	0.0	0.6	0.6	7.6	0.0	0.0	1.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	18.4	18.3	0.3	0.2	0.2	4.2	0.0	2.0	0.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	72.0	79.9	80.2	1.5	0.6	0.6	71.3	0.0	15.1	67.1	0.0	0.0
LnGrp LOS	E	E	F	A	A	A	E	A	B	E	A	A
Approach Vol, veh/h	878			1545			357			23		
Approach Delay, s/veh	80.0			0.9			50.4			67.1		
Approach LOS	E			A			D			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	32.4	41.9		9.6	7.4	106.9		16.1				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		5.3				
Max Green Setting (Gmax), s	32.3	44.4		27.7	6.1	71.0		14.7				
Max Q Clear Time (g_c+13.2), s	35.9			3.8	2.9	2.0		10.7				
Green Ext Time (p_c), s	0.1	0.7		0.0	0.0	0.9		0.0				

Intersection Summary

HCM 6th Ctrl Delay 32.5

HCM 6th LOS C

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

8: Herbert St/Coffey Ln & Guerneville Rd

Lance Drive Residential TIA
Near Term Plus Project PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	181	908	60	50	1187	90	40	20	30	100	30	230
Future Volume (veh/h)	181	908	60	50	1187	90	40	20	30	100	30	230
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.99	1.00		0.93	1.00		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	197	987	61	54	1290	94	43	22	16	109	33	51
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	211	1016	63	624	1785	130	79	40	29	157	47	357
Arrive On Green	0.24	0.60	0.60	0.35	0.54	0.54	0.09	0.09	0.09	0.11	0.11	0.11
Sat Flow, veh/h	1767	3363	208	1767	3330	242	912	467	339	1372	415	1483
Grp Volume(v), veh/h	197	517	531	54	681	703	81	0	0	142	0	51
Grp Sat Flow(s), veh/h/ln	1767	1763	1808	1767	1763	1810	1718	0	0	1787	0	1483
Q Serve(g_s), s	15.3	39.4	39.4	2.9	40.9	41.2	6.3	0.0	0.0	10.7	0.0	3.8
Cycle Q Clear(g_c), s	15.3	39.4	39.4	2.9	40.9	41.2	6.3	0.0	0.0	10.7	0.0	3.8
Prop In Lane	1.00		0.11	1.00		0.13	0.53		0.20	0.77		1.00
Lane Grp Cap(c), veh/h	211	532	546	624	945	970	149	0	0	204	0	357
V/C Ratio(X)	0.93	0.97	0.97	0.09	0.72	0.72	0.54	0.00	0.00	0.70	0.00	0.14
Avail Cap(c_a), veh/h	211	742	761	624	945	970	307	0	0	333	0	464
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.84	0.84	0.84	0.77	0.77	0.77	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	52.8	27.1	27.1	30.2	24.6	24.6	61.3	0.0	0.0	59.7	0.0	42.6
Incr Delay (d2), s/veh	38.8	29.5	29.1	0.0	3.7	3.6	1.1	0.0	0.0	1.6	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.1	15.3	15.6	1.2	17.3	17.9	2.8	0.0	0.0	4.9	0.0	1.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	91.6	56.6	56.2	30.2	28.2	28.3	62.4	0.0	0.0	61.2	0.0	42.6
LnGrp LOS	F	E	E	C	C	C	E	A	A	E	A	D
Approach Vol, veh/h	1245			1438			81			193		
Approach Delay, s/veh	62.0			28.3			62.4			56.3		
Approach LOS	E			C			E			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	54.8	47.6		20.9	22.0	80.3		16.7				
Change Period (Y+Rc), s	5.3	5.3		4.9	5.3	5.3		4.6				
Max Green Setting (Gmax), s	58.9	58.9		26.1	16.7	52.1		25.0				
Max Q Clear Time (g_c+14.5), s	41.4	41.4		12.7	17.3	43.2		8.3				
Green Ext Time (p_c), s	0.0	0.9		0.1	0.0	1.1		0.1				
Intersection Summary												
HCM 6th Ctrl Delay	45.3											
HCM 6th LOS	D											

HCM 6th Signalized Intersection Summary

9: Range Ave & Guerneville Rd

Lance Drive Residential TIA
Near Term Plus Project PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	150	666	202	90	834	22	273	160	140	101	220	240
Future Volume (veh/h)	150	666	202	90	834	22	273	160	140	101	220	240
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	156	694	0	94	869	0	174	321	71	105	229	78
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	590	1870		115	922		266	441	96	190	277	91
Arrive On Green	0.67	1.00	0.00	0.07	0.26	0.00	0.15	0.15	0.15	0.04	0.04	0.04
Sat Flow, veh/h	1767	3618	0	1767	3618	0	1767	2936	639	1767	2567	843
Grp Volume(v), veh/h	156	694	0	94	869	0	174	201	191	105	155	152
Grp Sat Flow(s),veh/h/ln	1767	1763	0	1767	1763	0	1767	1856	1719	1767	1763	1647
Q Serve(g_s), s	5.0	0.0	0.0	7.4	33.8	0.0	13.0	14.4	14.9	8.2	12.2	12.9
Cycle Q Clear(g_c), s	5.0	0.0	0.0	7.4	33.8	0.0	13.0	14.4	14.9	8.2	12.2	12.9
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.37	1.00		0.51
Lane Grp Cap(c), veh/h	590	1870		115	922		266	279	258	190	190	177
V/C Ratio(X)	0.26	0.37		0.82	0.94		0.66	0.72	0.74	0.55	0.81	0.86
Avail Cap(c_a), veh/h	590	1870		170	1030		422	443	410	302	301	281
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	0.77	0.77	0.00	0.92	0.92	0.00	1.00	1.00	1.00	0.56	0.56	0.56
Uniform Delay (d), s/veh	16.3	0.0	0.0	64.6	50.7	0.0	56.1	56.7	56.9	64.2	66.1	66.5
Incr Delay (d2), s/veh	0.1	0.4	0.0	10.0	13.7	0.0	1.0	1.3	1.6	0.5	2.4	5.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	0.1	0.0	3.6	16.5	0.0	5.9	6.9	6.6	3.8	5.9	6.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.4	0.4	0.0	74.6	64.4	0.0	57.1	58.0	58.4	64.7	68.5	71.5
LnGrp LOS	B	A		E	E		E	E	E	E	E	E
Approach Vol, veh/h	850		A	963		A	566			412		
Approach Delay, s/veh	3.4			65.4			57.9			68.6		
Approach LOS	A			E			E			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.4	79.6		20.4	52.1	41.9		25.6				
Change Period (Y+Rc), s	5.3	5.3		5.3	5.3	5.3		4.6				
Max Green Setting (Gmax), s	48.7	48.7		23.9	21.3	40.9		33.4				
Max Q Clear Time (g_c+19.4)	2.0	2.0		14.9	7.0	35.8		16.9				
Green Ext Time (p_c), s	0.0	0.8		0.2	0.0	0.8		0.3				

Intersection Summary

HCM 6th Ctrl Delay 45.4
HCM 6th LOS D

Notes

- User approved pedestrian interval to be less than phase max green.
- User approved volume balancing among the lanes for turning movement.
- Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

10: Guerneville Rd & Steele Wy

Lance Drive Residential TIA
Near Term Plus Project PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	775	102	130	853	12	73	40	160	321	50	20
Future Volume (veh/h)	20	775	102	130	853	12	73	40	160	321	50	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	20	791	77	133	870	12	58	64	71	364	0	4
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	712	2149	1062	180	924	13	132	139	197	443	0	824
Arrive On Green	0.13	0.20	0.20	0.05	0.26	0.26	0.07	0.07	0.07	0.13	0.00	0.13
Sat Flow, veh/h	1767	3526	1550	3428	3560	49	1767	1856	1528	3534	0	1525
Grp Volume(v), veh/h	20	791	77	133	431	451	58	64	71	364	0	4
Grp Sat Flow(s), veh/h/ln	1767	1763	1550	1714	1763	1846	1767	1856	1528	1767	0	1525
Q Serve(g_s), s	1.4	27.1	4.6	5.4	33.5	33.5	4.4	4.6	6.0	14.1	0.0	0.0
Cycle Q Clear(g_c), s	1.4	27.1	4.6	5.4	33.5	33.5	4.4	4.6	6.0	14.1	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.03	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	712	2149	1062	180	457	479	132	139	197	443	0	824
V/C Ratio(X)	0.03	0.37	0.07	0.74	0.94	0.94	0.44	0.46	0.36	0.82	0.00	0.00
Avail Cap(c_a), veh/h	712	2149	1062	321	656	687	358	376	393	810	0	983
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.85	0.85	0.85	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	36.9	32.7	15.7	65.4	50.8	50.8	62.0	62.1	55.9	59.7	0.0	15.6
Incr Delay (d2), s/veh	0.0	0.4	0.1	2.2	14.9	14.4	0.9	0.9	0.4	1.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	13.0	2.2	2.4	16.5	17.3	2.0	2.2	2.3	6.4	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.9	33.1	15.9	67.6	65.7	65.2	62.8	63.0	56.3	61.2	0.0	15.6
LnGrp LOS	D	C	B	E	E	E	E	E	E	E	A	B
Approach Vol, veh/h	888			1015			193			368		
Approach Delay, s/veh	31.7			65.8			60.5			60.7		
Approach LOS	C			E			E			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	2.3	90.2		22.4	61.3	41.2		15.1				
Change Period (Y+Rc), s	4.9	4.9		4.9	4.9	4.9		4.6				
Max Green Setting (Gmax), s	47.1			32.1	8.1	52.1		28.4				
Max Q Clear Time (g_c+11), s	29.1			16.1	3.4	35.5		8.0				
Green Ext Time (p_c), s	0.0	1.0		0.1	0.0	0.8		0.1				

Intersection Summary

HCM 6th Ctrl Delay 52.3

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

11: Cleveland Ave & Guerneville Rd

Lance Drive Residential TIA
Near Term Plus Project PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↑↑↑		↔↔	↑↑	↔	↔	↑↑		↔	↑↑	
Traffic Volume (veh/h)	110	1086	80	310	1295	200	90	130	230	410	340	120
Future Volume (veh/h)	110	1086	80	310	1295	200	90	130	230	410	340	120
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	115	1131	75	323	1349	142	94	135	46	296	538	106
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	169	1635	108	368	1394	609	389	572	187	345	584	115
Arrive On Green	0.05	0.34	0.34	0.11	0.40	0.40	0.22	0.22	0.22	0.19	0.19	0.19
Sat Flow, veh/h	3428	4844	321	3428	3526	1540	1767	2599	849	1767	2996	587
Grp Volume(v), veh/h	115	788	418	323	1349	142	94	90	91	296	332	312
Grp Sat Flow(s), veh/h/ln	1714	1689	1788	1714	1763	1540	1767	1763	1686	1767	1856	1727
Q Serve(g_s), s	4.6	28.2	28.3	13.0	52.5	8.6	6.1	5.9	6.3	22.7	24.6	24.8
Cycle Q Clear(g_c), s	4.6	28.2	28.3	13.0	52.5	8.6	6.1	5.9	6.3	22.7	24.6	24.8
Prop In Lane	1.00		0.18	1.00		1.00	1.00		0.50	1.00		0.34
Lane Grp Cap(c), veh/h	169	1140	603	368	1394	609	389	388	371	345	362	337
V/C Ratio(X)	0.68	0.69	0.69	0.88	0.97	0.23	0.24	0.23	0.25	0.86	0.92	0.93
Avail Cap(c_a), veh/h	198	1140	603	487	1438	628	389	388	371	468	492	458
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.52	0.52	0.52	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	65.4	40.1	40.1	61.6	41.5	28.2	45.0	44.8	45.0	54.5	55.3	55.4
Incr Delay (d2), s/veh	4.9	1.5	2.9	6.2	10.4	0.0	1.5	1.4	1.6	9.0	15.8	17.9
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	11.9	12.8	6.0	24.3	3.2	2.9	2.7	2.8	10.9	13.0	12.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	70.4	41.6	43.0	67.8	51.9	28.2	46.4	46.2	46.6	63.5	71.0	73.3
LnGrp LOS	E	D	D	E	D	C	D	D	D	E	E	E
Approach Vol, veh/h	1321			1814			275			940		
Approach Delay, s/veh	44.5			52.8			46.4			69.4		
Approach LOS	D			D			D			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.9	52.1		35.7	11.8	60.3		32.2				
Change Period (Y+Rc), s	4.9	4.9		4.9	4.9	4.9		4.9				
Max Green Setting (Gmax), s	9.9	45.3		18.1	8.1	57.1		37.1				
Max Q Clear Time (g_c+11.5), s	11.5	30.3		8.3	6.6	54.5		26.8				
Green Ext Time (p_c), s	0.0	1.5		0.1	0.0	0.9		0.5				

Intersection Summary

HCM 6th Ctrl Delay 53.5

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 12: US 101 SB Ramps & Guerneville Rd

Lance Drive Residential TIA
Near Term Plus Project PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑					↑	↑	↑
Traffic Volume (veh/h)	0	1179	567	300	1412	0	0	0	0	290	70	393
Future Volume (veh/h)	0	1179	567	300	1412	0	0	0	0	290	70	393
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1856	1856	1856	1856	0				1856	1856	1856
Adj Flow Rate, veh/h	0	1215	194	309	1456	0				186	231	371
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	1483	444	354	1520	0				886	930	788
Arrive On Green	0.00	0.29	0.29	0.10	0.43	0.00				0.50	0.50	0.50
Sat Flow, veh/h	0	5233	1516	3428	3618	0				1767	1856	1572
Grp Volume(v), veh/h	0	1215	194	309	1456	0				186	231	371
Grp Sat Flow(s),veh/h/ln	0	1689	1516	1714	1763	0				1767	1856	1572
Q Serve(g_s), s	0.0	31.2	14.5	12.4	56.0	0.0				8.2	9.9	21.6
Cycle Q Clear(g_c), s	0.0	31.2	14.5	12.4	56.0	0.0				8.2	9.9	21.6
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1483	444	354	1520	0				886	930	788
V/C Ratio(X)	0.00	0.82	0.44	0.87	0.96	0.00				0.21	0.25	0.47
Avail Cap(c_a), veh/h	0	2066	618	541	2118	0				886	930	788
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.57	0.57	0.74	0.74	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	46.1	40.2	61.8	38.6	0.0				19.5	19.9	22.8
Incr Delay (d2), s/veh	0.0	0.8	0.1	5.0	6.4	0.0				0.5	0.6	2.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	13.1	5.4	5.6	24.9	0.0				3.4	4.3	8.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	46.8	40.3	66.8	45.0	0.0				20.0	20.5	24.8
LnGrp LOS	A	D	D	E	D	A				C	C	C
Approach Vol, veh/h		1409			1765						788	
Approach Delay, s/veh		45.9			48.8						22.4	
Approach LOS		D			D						C	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	9.4	45.9		74.8		65.2						
Change Period (Y+Rc), s	4.9	4.9		4.6		4.9						
Max Green Setting (Gmax), s	22.5	57.1		46.4		84.1						
Max Q Clear Time (g_c+I14.4	14.4	33.2		23.6		58.0						
Green Ext Time (p_c), s	0.0	1.8		0.2		2.3						

Intersection Summary

HCM 6th Ctrl Delay 42.5
HCM 6th LOS D

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 13: US 101 NB Ramps & Guerneville Rd/Steele Ln

Lance Drive Residential TIA
Near Term Plus Project PM (120-140 Seconds)












Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↑↑			↑↑↑		↰	↰↱	↰			
Traffic Volume (veh/h)	441	1038	0	0	1013	240	699	10	330	0	0	0
Future Volume (veh/h)	441	1038	0	0	1013	240	699	10	330	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1856	1856	0	0	1856	1856	1856	1856	1856			
Adj Flow Rate, veh/h	459	1081	0	0	1055	223	805	0	160			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	3	3	0	0	3	3	3	3	3			
Cap, veh/h	1320	2442	0	0	1137	240	846	0	377			
Arrive On Green	0.77	1.00	0.00	0.00	0.27	0.27	0.24	0.00	0.24			
Sat Flow, veh/h	3428	3618	0	0	4336	880	3534	0	1572			
Grp Volume(v), veh/h	459	1081	0	0	854	424	805	0	160			
Grp Sat Flow(s),veh/h/ln	1714	1763	0	0	1689	1673	1767	0	1572			
Q Serve(g_s), s	5.9	0.0	0.0	0.0	34.5	34.6	31.4	0.0	12.1			
Cycle Q Clear(g_c), s	5.9	0.0	0.0	0.0	34.5	34.6	31.4	0.0	12.1			
Prop In Lane	1.00		0.00	0.00		0.53	1.00		1.00			
Lane Grp Cap(c), veh/h	1320	2442	0	0	921	456	846	0	377			
V/C Ratio(X)	0.35	0.44	0.00	0.00	0.93	0.93	0.95	0.00	0.42			
Avail Cap(c_a), veh/h	1320	2442	0	0	1209	599	1247	0	555			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.72	0.72	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	10.6	0.0	0.0	0.0	49.6	49.6	52.4	0.0	45.1			
Incr Delay (d2), s/veh	0.0	0.4	0.0	0.0	9.1	16.0	9.9	0.0	0.3			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	1.9	0.1	0.0	0.0	15.6	16.3	14.7	0.0	4.7			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	10.6	0.4	0.0	0.0	58.6	65.6	62.4	0.0	45.4			
LnGrp LOS	B	A	A	A	E	E	E	A	D			
Approach Vol, veh/h	1540			1278			965					
Approach Delay, s/veh	3.5			60.9			59.5					
Approach LOS	A			E			E					
Timer - Assigned Phs	2			5			6			8		
Phs Duration (G+Y+Rc), s	101.9			58.8			43.1			38.1		
Change Period (Y+Rc), s	4.9			4.9			4.9			4.6		
Max Green Setting (Gmax), s	81.1			26.1			50.1			49.4		
Max Q Clear Time (g_c+I1), s	2.0			7.9			36.6			33.4		
Green Ext Time (p_c), s	1.6			0.1			1.6			0.1		
Intersection Summary												
HCM 6th Ctrl Delay				37.2								
HCM 6th LOS				D								

HCM 6th Signalized Intersection Summary

14: Stony Point Rd/Marlow Rd & W College Ave

Lance Drive Residential TIA
Near Term Plus Project PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	93	260	110	224	370	210	160	770	266	170	832	128
Future Volume (veh/h)	93	260	110	224	370	210	160	770	266	170	832	128
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No				No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	98	274	76	236	389	155	168	811	157	179	876	124
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	411	350	95	527	477	187	191	934	878	277	970	137
Arrive On Green	0.23	0.13	0.13	0.30	0.19	0.19	0.11	0.26	0.26	0.16	0.31	0.31
Sat Flow, veh/h	1767	2727	740	1767	2460	966	1767	3526	1544	1767	3093	438
Grp Volume(v), veh/h	98	175	175	236	277	267	168	811	157	179	499	501
Grp Sat Flow(s),veh/h/ln	1767	1763	1704	1767	1763	1663	1767	1763	1544	1767	1763	1768
Q Serve(g_s), s	6.3	13.4	14.0	15.1	21.1	21.6	13.1	30.7	2.6	13.3	38.0	38.0
Cycle Q Clear(g_c), s	6.3	13.4	14.0	15.1	21.1	21.6	13.1	30.7	2.6	13.3	38.0	38.0
Prop In Lane	1.00		0.43	1.00		0.58	1.00		1.00	1.00		0.25
Lane Grp Cap(c), veh/h	411	226	219	527	342	323	191	934	878	277	553	555
V/C Ratio(X)	0.24	0.77	0.80	0.45	0.81	0.83	0.88	0.87	0.18	0.65	0.90	0.90
Avail Cap(c_a), veh/h	411	327	317	527	501	473	211	1100	951	277	613	615
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.47	0.47	0.47	1.00	1.00	1.00	0.47	0.47	0.47
Uniform Delay (d), s/veh	43.6	59.1	59.3	39.8	54.0	54.2	61.5	49.1	5.1	55.4	46.0	46.0
Incr Delay (d2), s/veh	0.3	6.9	9.0	0.3	3.1	3.8	29.9	6.7	0.1	2.4	8.5	8.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	6.4	6.5	6.6	9.5	9.2	7.4	14.2	1.0	6.1	17.6	17.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.9	66.0	68.3	40.0	57.0	58.0	91.4	55.8	5.2	57.8	54.5	54.4
LnGrp LOS	D	E	E	D	E	E	F	E	A	E	D	D
Approach Vol, veh/h	448		780				1136			1179		
Approach Delay, s/veh	62.0		52.2				54.1			55.0		
Approach LOS	E		D				D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	47.1	23.3	20.5	49.2	37.9	32.5	27.3	42.4				
Change Period (Y+Rc), s	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3				
Max Green Setting (Gmax), s	27.4	26.0	16.7	48.7	13.6	39.8	21.7	43.7				
Max Q Clear Time (g_c+I1), s	11.7	16.0	15.1	40.0	8.3	23.6	15.3	32.7				
Green Ext Time (p_c), s	0.5	1.3	0.1	3.9	0.1	2.8	0.2	4.3				

Intersection Summary

HCM 6th Ctrl Delay 55.0

HCM 6th LOS D









Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary 15: N Dutton Ave & W College Ave

Lance Drive Residential TIA
Near Term Plus Project PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	600	110	180	810	193	160	356	130	315	506	150
Future Volume (veh/h)	90	600	110	180	810	193	160	356	130	315	506	150
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	94	625	103	188	844	186	167	371	100	328	527	130
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	116	681	112	266	908	200	523	432	115	624	600	147
Arrive On Green	0.07	0.23	0.23	0.15	0.32	0.32	0.30	0.16	0.16	0.35	0.21	0.21
Sat Flow, veh/h	1767	3022	497	1767	2862	631	1767	2740	728	1767	2793	685
Grp Volume(v), veh/h	94	364	364	188	520	510	167	237	234	328	332	325
Grp Sat Flow(s),veh/h/ln	1767	1763	1756	1767	1763	1730	1767	1763	1706	1767	1763	1715
Q Serve(g_s), s	6.8	26.2	26.3	13.1	37.1	37.1	9.5	17.0	17.4	19.2	23.7	23.9
Cycle Q Clear(g_c), s	6.8	26.2	26.3	13.1	37.1	37.1	9.5	17.0	17.4	19.2	23.7	23.9
Prop In Lane	1.00		0.28	1.00		0.36	1.00		0.43	1.00		0.40
Lane Grp Cap(c), veh/h	116	397	396	266	559	549	523	278	269	624	379	369
V/C Ratio(X)	0.81	0.92	0.92	0.71	0.93	0.93	0.32	0.85	0.87	0.53	0.88	0.88
Avail Cap(c_a), veh/h	150	462	461	394	706	693	523	462	448	624	517	503
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.79	0.79	0.79	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	59.9	49.2	49.2	52.5	43.0	43.0	35.6	53.3	53.4	33.4	49.3	49.4
Incr Delay (d2), s/veh	14.2	16.6	17.2	1.3	14.9	15.1	0.1	3.6	5.1	0.4	9.7	10.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	13.3	13.3	5.9	18.2	17.9	4.1	7.7	7.8	8.1	11.2	11.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	74.1	65.8	66.4	53.8	57.9	58.1	35.7	56.9	58.5	33.8	59.1	60.1
LnGrp LOS	E	E	E	D	E	E	D	E	E	C	E	E
Approach Vol, veh/h	822				1218				638			
Approach Delay, s/veh	67.0				57.4				51.9			
Approach LOS	E				E				D			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	33.5	33.2	41.5	31.8	11.5	45.1	48.9	24.4				
Change Period (Y+Rc), s	3.9	* 3.9	3.0	3.9	3.0	3.9	3.0	3.9				
Max Green Setting (Gmax), s	29.0	* 34	15.0	38.1	11.0	52.1	19.0	34.1				
Max Q Clear Time (g_c+11.5, s)	11.5	28.3	11.5	25.9	8.8	39.1	21.2	19.4				
Green Ext Time (p_c), s	0.1	1.0	0.0	1.1	0.0	2.1	0.0	0.9				

Intersection Summary

HCM 6th Ctrl Delay 56.9
HCM 6th LOS E

Notes





User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection

Intersection Delay, s/veh 8.8

Intersection LOS A




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	50	0	62	78	99	0	6	36	85	7	13
Future Vol, veh/h	7	50	0	62	78	99	0	6	36	85	7	13
Peak Hour Factor	0.86	0.86	0.92	0.92	0.86	0.86	0.92	0.92	0.92	0.86	0.92	0.86
Heavy Vehicles, %	3	3	2	2	3	3	2	2	2	3	2	3
Mvmt Flow	8	58	0	67	91	115	0	7	39	99	8	15
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.1	9.2	7.6	8.8
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	12%	26%	81%
Vol Thru, %	14%	88%	33%	7%
Vol Right, %	86%	0%	41%	12%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	42	57	239	105
LT Vol	0	7	62	85
Through Vol	6	50	78	7
RT Vol	36	0	99	13
Lane Flow Rate	46	66	273	122
Geometry Grp	1	1	1	1
Degree of Util (X)	0.055	0.086	0.32	0.164
Departure Headway (Hd)	4.33	4.669	4.218	4.846
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	826	767	852	740
Service Time	2.362	2.699	2.24	2.873
HCM Lane V/C Ratio	0.056	0.086	0.32	0.165
HCM Control Delay	7.6	8.1	9.2	8.8
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.2	0.3	1.4	0.6




HCM 6th TWSC
17: Iroquois St & Project Driveway (1)

Lance Drive Residential TIA
Near Term Plus Project PM (120-140 Seconds)

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	5	8	97	96	3
Future Vol, veh/h	1	5	8	97	96	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	5	9	105	104	3
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	229	106	107	0	-	0
Stage 1	106	-	-	-	-	-
Stage 2	123	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	759	948	1484	-	-	-
Stage 1	918	-	-	-	-	-
Stage 2	902	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	754	948	1484	-	-	-
Mov Cap-2 Maneuver	754	-	-	-	-	-
Stage 1	912	-	-	-	-	-
Stage 2	902	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	9	0.6		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1484	-	909	-	-	
HCM Lane V/C Ratio	0.006	-	0.007	-	-	
HCM Control Delay (s)	7.4	0	9	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	




HCM 6th TWSC
18: Iroquois St & Project Driveway (2)

Lance Drive Residential TIA
Near Term Plus Project PM (120-140 Seconds)

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	6	9	103	99	2
Future Vol, veh/h	2	6	9	103	99	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	7	10	112	108	2
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	241	109	110	0	-	0
Stage 1	109	-	-	-	-	-
Stage 2	132	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	747	945	1480	-	-	-
Stage 1	916	-	-	-	-	-
Stage 2	894	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	742	945	1480	-	-	-
Mov Cap-2 Maneuver	742	-	-	-	-	-
Stage 1	910	-	-	-	-	-
Stage 2	894	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	9.1	0.6		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1480	-	885	-	-	
HCM Lane V/C Ratio	0.007	-	0.01	-	-	
HCM Control Delay (s)	7.4	0	9.1	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	




HCM 6th TWSC
19: Project Driveway (3) & Lance Dr

Lance Drive Residential TIA
Near Term Plus Project PM (120-140 Seconds)

Intersection						
Int Delay, s/veh	1.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	168	3	43	236	3	27
Future Vol, veh/h	168	3	43	236	3	27
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	183	3	47	257	3	29
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	186	0	536	185
Stage 1	-	-	-	-	185	-
Stage 2	-	-	-	-	351	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1388	-	505	857
Stage 1	-	-	-	-	847	-
Stage 2	-	-	-	-	713	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1388	-	485	857
Mov Cap-2 Maneuver	-	-	-	-	485	-
Stage 1	-	-	-	-	847	-
Stage 2	-	-	-	-	685	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		1.2		9.7	
HCM LOS					A	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	796	-	-	1388	-	
HCM Lane V/C Ratio	0.041	-	-	0.034	-	
HCM Control Delay (s)	9.7	-	-	7.7	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0.1	-	-	0.1	-	

HCM 6th TWSC
20: Guerneville Rd & Project Driveway (4)


Lance Drive Residential TIA
Near Term Plus Project PM (120-140 Seconds)

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	9	708	956	20	13	5
Future Vol, veh/h	9	708	956	20	13	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	770	1039	22	14	5
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	1061	0	-	0	1455	531
Stage 1	-	-	-	-	1050	-
Stage 2	-	-	-	-	405	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	652	-	-	-	121	493
Stage 1	-	-	-	-	298	-
Stage 2	-	-	-	-	642	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	652	-	-	-	118	493
Mov Cap-2 Maneuver	-	-	-	-	118	-
Stage 1	-	-	-	-	290	-
Stage 2	-	-	-	-	642	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.2	0		32.6		
HCM LOS				D		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	652	-	-	-	150	
HCM Lane V/C Ratio	0.015	-	-	-	0.13	
HCM Control Delay (s)	10.6	0.1	-	-	32.6	
HCM Lane LOS	B	A	-	-	D	
HCM 95th %tile Q(veh)	0	-	-	-	0.4	

HCM 6th Signalized Intersection Summary







1: Marlow Rd & Marlow Ct/W Steele Ln

Lance Drive Residential TIA
Cumulative AM (95-120 Seconds)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔	↔	↔	↕	↔	↔	↕	↕
Traffic Volume (veh/h)	10	10	10	260	10	210	10	600	260	160	580	10
Future Volume (veh/h)	10	10	10	260	10	210	10	600	260	160	580	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		1.00	1.00		0.96	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	12	12	2	311	0	154	12	698	209	186	674	12
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	33	33	6	1582	0	841	25	883	1082	157	1144	20
Arrive On Green	0.04	0.04	0.04	0.45	0.00	0.45	0.01	0.25	0.25	0.09	0.32	0.32
Sat Flow, veh/h	822	822	137	3534	0	1565	1767	3526	1509	1767	3543	63
Grp Volume(v), veh/h	26	0	0	311	0	154	12	698	209	186	335	351
Grp Sat Flow(s),veh/h/ln	1782	0	0	1767	0	1565	1767	1763	1509	1767	1763	1844
Q Serve(g_s), s	1.6	0.0	0.0	5.9	0.0	0.0	0.7	20.4	5.3	9.8	17.5	17.5
Cycle Q Clear(g_c), s	1.6	0.0	0.0	5.9	0.0	0.0	0.7	20.4	5.3	9.8	17.5	17.5
Prop In Lane	0.46		0.08	1.00		1.00	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	72	0	0	1582	0	841	25	883	1082	157	569	595
V/C Ratio(X)	0.36	0.00	0.00	0.20	0.00	0.18	0.49	0.79	0.19	1.18	0.59	0.59
Avail Cap(c_a), veh/h	308	0	0	1582	0	841	80	1026	1143	157	585	612
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.56	0.56	0.56	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.4	0.0	0.0	18.4	0.0	13.1	53.8	38.5	5.8	50.1	31.1	31.1
Incr Delay (d2), s/veh	3.1	0.0	0.0	0.3	0.0	0.5	8.1	2.1	0.0	128.8	1.5	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.0	2.4	0.0	2.0	0.4	8.9	4.8	9.9	7.5	7.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.5	0.0	0.0	18.7	0.0	13.6	61.9	40.6	5.9	178.9	32.6	32.6
LnGrp LOS	D	A	A	B	A	B	E	D	A	F	C	C
Approach Vol, veh/h		26			465			919			872	
Approach Delay, s/veh		54.5			17.0			33.0			63.8	
Approach LOS		D			B			C			E	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		53.8	6.4	40.4		9.3	14.7	32.1				
Change Period (Y+Rc), s		4.6	4.9	4.9		4.9	4.9	4.6				
Max Green Setting (Gmax), s		30.2	5.0	36.5		19.0	9.8	32.0				
Max Q Clear Time (g_c+I1), s		7.9	2.7	19.5		3.6	11.8	22.4				
Green Ext Time (p_c), s		1.6	0.0	3.8		0.1	0.0	3.8				
Intersection Summary												
HCM 6th Ctrl Delay			41.8									
HCM 6th LOS			D									
Notes												
User approved pedestrian interval to be less than phase max green.												
User approved volume balancing among the lanes for turning movement.												






















HCM 6th TWSC
2: Iroquois St/Apple Valley Ln & W Steele Ln

Lance Drive Residential TIA
Cumulative AM (95-120 Seconds)

Intersection												
Int Delay, s/veh	6.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	40	420	60	20	360	20	50	10	30	20	10	50
Future Vol, veh/h	40	420	60	20	360	20	50	10	30	20	10	50
Conflicting Peds, #/hr	12	0	24	24	0	12	4	0	4	4	0	4
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	60	-	-	80	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	48	506	72	24	434	24	60	12	36	24	12	60
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	470	0	0	602	0	0	1196	1180	570	1172	1204	462
Stage 1	-	-	-	-	-	-	662	662	-	506	506	-
Stage 2	-	-	-	-	-	-	534	518	-	666	698	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1086	-	-	971	-	-	162	189	519	168	183	598
Stage 1	-	-	-	-	-	-	449	458	-	547	538	-
Stage 2	-	-	-	-	-	-	528	532	-	447	441	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1074	-	-	949	-	-	127	170	505	138	165	589
Mov Cap-2 Maneuver	-	-	-	-	-	-	127	170	-	138	165	-
Stage 1	-	-	-	-	-	-	419	427	-	516	519	-
Stage 2	-	-	-	-	-	-	450	513	-	384	411	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.7			0.4			53.7			25		
HCM LOS							F			D		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	176	1074	-	-	949	-	-	275				
HCM Lane V/C Ratio	0.616	0.045	-	-	0.025	-	-	0.35				
HCM Control Delay (s)	53.7	8.5	-	-	8.9	-	-	25				
HCM Lane LOS	F	A	-	-	A	-	-	D				
HCM 95th %tile Q(veh)	3.4	0.1	-	-	0.1	-	-	1.5				

HCM 6th Signalized Intersection Summary 3: Range Ave & W Steele Ln

Lance Drive Residential TIA
Cumulative AM (95-120 Seconds)











												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	490	60	60	320	50	50	210	30	40	180	40
Future Volume (veh/h)	50	490	60	60	320	50	50	210	30	40	180	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.96	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	57	557	66	68	364	55	57	239	20	45	205	29
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	664	1144	136	512	1105	167	73	460	38	65	447	62
Arrive On Green	0.70	0.70	0.70	0.70	0.70	0.70	0.04	0.14	0.14	0.04	0.14	0.14
Sat Flow, veh/h	959	1627	193	795	1571	237	1767	3282	272	1767	3087	429
Grp Volume(v), veh/h	57	0	623	68	0	419	57	127	132	45	115	119
Grp Sat Flow(s),veh/h/ln	959	0	1820	795	0	1808	1767	1763	1792	1767	1763	1753
Q Serve(g_s), s	2.3	0.0	14.7	4.0	0.0	8.5	3.0	6.4	6.5	2.4	5.7	5.9
Cycle Q Clear(g_c), s	10.8	0.0	14.7	18.7	0.0	8.5	3.0	6.4	6.5	2.4	5.7	5.9
Prop In Lane	1.00		0.11	1.00		0.13	1.00		0.15	1.00		0.24
Lane Grp Cap(c), veh/h	664	0	1280	512	0	1272	73	247	251	65	255	254
V/C Ratio(X)	0.09	0.00	0.49	0.13	0.00	0.33	0.78	0.52	0.52	0.70	0.45	0.47
Avail Cap(c_a), veh/h	664	0	1280	512	0	1272	149	466	473	149	466	463
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.83	0.83	0.83	1.00	1.00	1.00
Uniform Delay (d), s/veh	7.5	0.0	6.4	10.6	0.0	5.4	45.1	37.9	37.9	45.2	37.2	37.3
Incr Delay (d2), s/veh	0.3	0.0	1.3	0.5	0.0	0.7	5.6	0.5	0.5	4.9	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	4.9	0.7	0.0	2.8	1.4	2.7	2.8	1.1	2.4	2.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	7.8	0.0	7.7	11.1	0.0	6.1	50.7	38.4	38.4	50.2	37.6	37.7
LnGrp LOS	A	A	A	B	A	A	D	D	D	D	D	D
Approach Vol, veh/h		680			487			316			279	
Approach Delay, s/veh		7.7			6.8			40.6			39.7	
Approach LOS		A			A			D			D	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		70.4	6.9	17.7		70.4	7.4	17.2				
Change Period (Y+Rc), s		3.6	3.0	3.9		3.6	3.9	* 3.9				
Max Green Setting (Gmax), s		51.4	8.0	25.1		51.4	8.0	* 25				
Max Q Clear Time (g_c+I1), s		16.7	5.0	7.9		20.7	4.4	8.5				
Green Ext Time (p_c), s		1.5	0.0	0.4		1.0	0.0	0.4				
Intersection Summary												
HCM 6th Ctrl Delay			18.4									
HCM 6th LOS			B									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

HCM 6th Signalized Intersection Summary

4: Marlow Rd & Guerneville Rd

Lance Drive Residential TIA
Cumulative AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	140	530	170	170	320	110	150	560	200	140	590	100
Future Volume (veh/h)	140	530	170	170	320	110	150	560	200	140	590	100
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	152	576	119	185	348	94	163	609	94	152	641	95
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	177	755	471	169	589	157	154	779	491	220	792	117
Arrive On Green	0.10	0.21	0.21	0.10	0.21	0.21	0.09	0.22	0.22	0.12	0.26	0.26
Sat Flow, veh/h	1767	3526	1559	1767	2748	732	1767	3526	1542	1767	3071	454
Grp Volume(v), veh/h	152	576	119	185	221	221	163	609	94	152	367	369
Grp Sat Flow(s),veh/h/ln	1767	1763	1559	1767	1763	1717	1767	1763	1542	1767	1763	1763
Q Serve(g_s), s	8.0	14.6	2.5	9.1	10.7	11.0	8.3	15.5	0.0	7.8	18.6	18.6
Cycle Q Clear(g_c), s	8.0	14.6	2.5	9.1	10.7	11.0	8.3	15.5	0.0	7.8	18.6	18.6
Prop In Lane	1.00		1.00	1.00		0.43	1.00		1.00	1.00		0.26
Lane Grp Cap(c), veh/h	177	755	471	169	378	368	154	779	491	220	455	455
V/C Ratio(X)	0.86	0.76	0.25	1.09	0.59	0.60	1.06	0.78	0.19	0.69	0.81	0.81
Avail Cap(c_a), veh/h	177	965	564	169	475	463	154	1065	616	220	557	557
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.99	0.99	0.99	0.45	0.45	0.45	0.87	0.87	0.87
Uniform Delay (d), s/veh	42.1	35.1	6.3	43.0	33.5	33.7	43.3	34.9	23.6	39.9	33.0	33.1
Incr Delay (d2), s/veh	32.3	2.7	0.3	95.8	6.5	7.0	64.0	1.2	0.1	7.8	6.3	6.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.0	6.3	1.4	8.3	5.1	5.1	6.2	6.5	1.5	3.8	8.5	8.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	74.4	37.8	6.6	138.8	40.0	40.6	107.4	36.1	23.7	47.7	39.4	39.5
LnGrp LOS	E	D	A	F	D	D	F	D	C	D	D	D
Approach Vol, veh/h	847			627			866			888		
Approach Delay, s/veh	40.0			69.4			48.1			40.9		
Approach LOS	D			E			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	4.8	26.0	13.6	29.8	14.8	26.0	17.1	26.3				
Change Period (Y+Rc), s	5.7	* 5.7	5.3	5.3	5.3	5.7	5.3	5.3				
Max Green Setting (Gmax), s	26	* 26	8.3	30.0	9.5	25.6	9.6	28.7				
Max Q Clear Time (g_c+I1), s	16.6	16.6	10.3	20.6	10.0	13.0	9.8	17.5				
Green Ext Time (p_c), s	0.0	2.8	0.0	3.1	0.0	2.0	0.0	3.2				

Intersection Summary

HCM 6th Ctrl Delay 48.1
HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary 5: Ridley Ave & Guerneville Rd

Lance Drive Residential TIA
Cumulative AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	810	30	70	520	20	50	10	70	40	10	30
Future Volume (veh/h)	30	810	30	70	520	20	50	10	70	40	10	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	0.99		0.97	0.99		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	34	910	33	79	584	21	56	11	31	45	11	9
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	731	2813	102	514	2816	101	146	36	57	178	42	25
Arrive On Green	0.81	0.81	0.81	1.00	1.00	1.00	0.12	0.12	0.12	0.12	0.12	0.12
Sat Flow, veh/h	807	3466	126	589	3471	125	750	307	489	981	365	216
Grp Volume(v), veh/h	34	463	480	79	296	309	98	0	0	65	0	0
Grp Sat Flow(s),veh/h/ln	807	1763	1829	589	1763	1832	1547	0	0	1563	0	0
Q Serve(g_s), s	0.8	6.4	6.4	1.3	0.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.8	6.4	6.4	7.6	0.0	0.0	5.3	0.0	0.0	3.3	0.0	0.0
Prop In Lane	1.00		0.07	1.00		0.07	0.57		0.32	0.69		0.14
Lane Grp Cap(c), veh/h	731	1430	1484	514	1430	1487	239	0	0	245	0	0
V/C Ratio(X)	0.05	0.32	0.32	0.15	0.21	0.21	0.41	0.00	0.00	0.27	0.00	0.00
Avail Cap(c_a), veh/h	731	1430	1484	514	1430	1487	590	0	0	591	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.85	0.85	0.85	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	1.8	2.3	2.3	0.3	0.0	0.0	39.4	0.0	0.0	38.6	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.5	0.5	0.1	0.0	0.0	0.4	0.0	0.0	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	1.2	1.3	0.0	0.0	0.0	2.2	0.0	0.0	1.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	1.9	2.8	2.8	0.4	0.0	0.0	39.8	0.0	0.0	38.8	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	D	A	A	D	A	A
Approach Vol, veh/h	977			684			98			65		
Approach Delay, s/veh	2.8			0.1			39.8			38.8		
Approach LOS	A			A			D			D		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	81.0			14.0			81.0			14.0		
Change Period (Y+Rc), s	3.9			3.0			3.9			3.0		
Max Green Setting (Gmax), s	54.1			34.0			54.1			34.0		
Max Q Clear Time (g_c+I1), s	8.4			5.3			9.6			7.3		
Green Ext Time (p_c), s	1.9			0.2			1.5			0.3		

Intersection Summary

HCM 6th Ctrl Delay	5.0
HCM 6th LOS	A

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

6: Lance Dr & Guerneville Rd

Lance Drive Residential TIA
Cumulative AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	850	30	30	520	60	20	60	80	70	100	70
Future Volume (veh/h)	30	850	30	30	520	60	20	60	80	70	100	70
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.99	0.99		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	36	1012	35	36	619	51	24	71	59	83	119	68
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	68	1105	38	80	1144	499	73	176	128	133	156	81
Arrive On Green	0.01	0.10	0.10	0.01	0.11	0.11	0.20	0.20	0.20	0.20	0.20	0.20
Sat Flow, veh/h	1767	3473	120	1767	3526	1537	149	889	645	421	788	407
Grp Volume(v), veh/h	36	514	533	36	619	51	154	0	0	270	0	0
Grp Sat Flow(s), veh/h/ln	1767	1763	1831	1767	1763	1537	1682	0	0	1616	0	0
Q Serve(g_s), s	1.9	27.4	27.4	1.9	15.8	2.8	0.0	0.0	0.0	7.6	0.0	0.0
Cycle Q Clear(g_c), s	1.9	27.4	27.4	1.9	15.8	2.8	7.4	0.0	0.0	15.1	0.0	0.0
Prop In Lane	1.00		0.07	1.00		1.00	0.16		0.38	0.31		0.25
Lane Grp Cap(c), veh/h	68	561	582	80	1144	499	378	0	0	371	0	0
V/C Ratio(X)	0.53	0.92	0.92	0.45	0.54	0.10	0.41	0.00	0.00	0.73	0.00	0.00
Avail Cap(c_a), veh/h	125	737	765	143	1510	658	606	0	0	591	0	0
HCM Platoon Ratio	0.33	0.33	0.33	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.96	0.96	0.96	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	46.0	41.3	41.3	45.6	35.7	29.9	33.5	0.0	0.0	36.3	0.0	0.0
Incr Delay (d2), s/veh	2.3	11.8	11.4	1.4	1.8	0.4	0.3	0.0	0.0	1.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	14.6	15.1	0.9	7.7	1.1	3.2	0.0	0.0	6.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.3	53.0	52.7	47.0	37.5	30.3	33.7	0.0	0.0	37.4	0.0	0.0
LnGrp LOS	D	D	D	D	D	C	C	A	A	D	A	A
Approach Vol, veh/h	1083			706			154			270		
Approach Delay, s/veh	52.7			37.4			33.7			37.4		
Approach LOS	D			D			C			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.6	35.5		23.5	9.0	36.1		23.5				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		4.6				
Max Green Setting (Gmax), s	7.5	39.7		32.4	6.7	40.7		32.4				
Max Q Clear Time (g_c+13, s)	9.5	29.4		17.1	3.9	17.8		9.4				
Green Ext Time (p_c), s	0.0	0.8		0.3	0.0	0.7		0.2				

Intersection Summary

HCM 6th Ctrl Delay 44.6

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

7: N Dutton Ave/Westberry Dr & Guerneville Rd

Lance Drive Residential TIA
Cumulative AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	980	120	290	540	10	100	10	440	30	10	10
Future Volume (veh/h)	10	980	120	290	540	10	100	10	440	30	10	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	12	1181	139	349	651	11	129	0	219	36	12	5
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	30	1105	130	1113	2326	39	186	0	593	70	23	10
Arrive On Green	0.02	0.35	0.35	0.32	0.66	0.66	0.05	0.00	0.05	0.06	0.06	0.06
Sat Flow, veh/h	1767	3171	372	3428	3546	60	3534	0	1564	1196	399	166
Grp Volume(v), veh/h	12	655	665	349	324	338	129	0	219	53	0	0
Grp Sat Flow(s), veh/h/ln	1767	1763	1780	1714	1763	1843	1767	0	1564	1761	0	0
Q Serve(g_s), s	0.6	33.1	33.1	7.3	7.3	7.4	3.4	0.0	0.0	2.8	0.0	0.0
Cycle Q Clear(g_c), s	0.6	33.1	33.1	7.3	7.3	7.4	3.4	0.0	0.0	2.8	0.0	0.0
Prop In Lane	1.00		0.21	1.00		0.03	1.00		1.00	0.68		0.09
Lane Grp Cap(c), veh/h	30	614	620	1113	1156	1209	186	0	593	103	0	0
V/C Ratio(X)	0.40	1.07	1.07	0.31	0.28	0.28	0.69	0.00	0.37	0.51	0.00	0.00
Avail Cap(c_a), veh/h	112	614	620	1113	1156	1209	186	0	593	514	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.86	0.86	0.86	0.91	0.91	0.91	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	46.2	30.9	31.0	24.1	6.9	6.9	44.2	0.0	21.4	43.4	0.0	0.0
Incr Delay (d2), s/veh	2.7	52.8	54.5	0.1	0.5	0.5	9.0	0.0	0.1	1.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	22.0	22.6	2.8	2.4	2.5	1.7	0.0	3.4	1.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.9	83.8	85.5	24.2	7.4	7.4	53.2	0.0	21.5	44.9	0.0	0.0
LnGrp LOS	D	F	F	C	A	A	D	A	C	D	A	A
Approach Vol, veh/h	1332			1011			348			53		
Approach Delay, s/veh	84.3			13.2			33.3			44.9		
Approach LOS	F			B			C			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	36.1	38.4		10.2	6.9	67.6		10.3				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		5.3				
Max Green Setting (Gmax), s	33.1	33.1		27.7	6.0	35.8		5.0				
Max Q Clear Time (g_c+1/3), s	35.1	35.1		4.8	2.6	9.4		5.4				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	0.5		0.0				

Intersection Summary

HCM 6th Ctrl Delay 50.9

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

8: Herbert St/Coffey Ln & Guerneville Rd

Lance Drive Residential TIA
Cumulative AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	150	1250	40	30	620	50	30	20	20	90	10	180
Future Volume (veh/h)	150	1250	40	30	620	50	30	20	20	90	10	180
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		0.95	1.00		0.94	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	174	1453	46	35	721	55	35	23	6	105	12	76
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	201	1172	37	570	1802	137	65	43	11	158	18	329
Arrive On Green	0.11	0.34	0.34	0.32	0.54	0.54	0.07	0.07	0.07	0.10	0.10	0.10
Sat Flow, veh/h	1767	3482	110	1767	3307	252	965	634	165	1594	182	1513
Grp Volume(v), veh/h	174	734	765	35	384	392	64	0	0	117	0	76
Grp Sat Flow(s), veh/h/ln	1767	1763	1829	1767	1763	1796	1765	0	0	1776	0	1513
Q Serve(g_s), s	11.1	38.7	38.7	1.6	14.6	14.6	4.0	0.0	0.0	7.3	0.0	4.8
Cycle Q Clear(g_c), s	11.1	38.7	38.7	1.6	14.6	14.6	4.0	0.0	0.0	7.3	0.0	4.8
Prop In Lane	1.00		0.06	1.00		0.14	0.55		0.09	0.90		1.00
Lane Grp Cap(c), veh/h	201	593	615	570	961	979	118	0	0	176	0	329
V/C Ratio(X)	0.86	1.24	1.24	0.06	0.40	0.40	0.54	0.00	0.00	0.66	0.00	0.23
Avail Cap(c_a), veh/h	364	593	615	570	961	979	384	0	0	401	0	521
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.60	0.60	0.60	0.89	0.89	0.89	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	50.1	38.1	38.2	26.9	15.2	15.2	51.9	0.0	0.0	49.9	0.0	37.5
Incr Delay (d2), s/veh	2.6	115.7	117.6	0.0	1.1	1.1	1.4	0.0	0.0	1.6	0.0	0.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.0	35.0	36.7	0.7	5.8	5.9	1.8	0.0	0.0	3.3	0.0	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.7	153.8	155.8	26.9	16.3	16.3	53.4	0.0	0.0	51.5	0.0	37.6
LnGrp LOS	D	F	F	C	B	B	D	A	A	D	A	D
Approach Vol, veh/h	1673			811			64			193		
Approach Delay, s/veh	144.2			16.8			53.4			46.1		
Approach LOS	F			B			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	42.4	44.0		16.3	18.4	68.0		12.3				
Change Period (Y+Rc), s	5.3	5.3		4.9	5.3	5.3		4.6				
Max Green Setting (Gmax), s	5.2	38.7		26.0	23.7	20.2		25.0				
Max Q Clear Time (g_c+I1), s	13.6	40.7		9.3	13.1	16.6		6.0				
Green Ext Time (p_c), s	0.0	0.0		0.1	0.0	0.4		0.1				

Intersection Summary

HCM 6th Ctrl Delay 97.5

HCM 6th LOS F

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary 9: Range Ave & Guerneville Rd

Lance Drive Residential TIA
Cumulative AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	170	810	180	90	470	10	160	110	90	40	120	130
Future Volume (veh/h)	170	810	180	90	470	10	160	110	90	40	120	130
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No		No				No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	181	862	0	96	500	0	102	212	19	43	128	38
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	265	950		112	645		190	361	32	130	197	56
Arrive On Green	0.15	0.27	0.00	0.06	0.18	0.00	0.11	0.11	0.11	0.02	0.02	0.02
Sat Flow, veh/h	1767	3618	0	1767	3618	0	1767	3349	297	1767	2680	761
Grp Volume(v), veh/h	181	862	0	96	500	0	102	116	115	43	82	84
Grp Sat Flow(s),veh/h/ln	1767	1763	0	1767	1763	0	1767	1856	1790	1767	1763	1678
Q Serve(g_s), s	9.2	22.5	0.0	5.1	12.8	0.0	5.2	5.7	5.8	2.3	4.4	4.7
Cycle Q Clear(g_c), s	9.2	22.5	0.0	5.1	12.8	0.0	5.2	5.7	5.8	2.3	4.4	4.7
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.17	1.00		0.45
Lane Grp Cap(c), veh/h	265	950		112	645		190	200	193	130	129	123
V/C Ratio(X)	0.68	0.91		0.86	0.78		0.54	0.58	0.59	0.33	0.64	0.68
Avail Cap(c_a), veh/h	265	1058		112	1058		614	645	622	130	130	124
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	0.67	0.67	0.00	0.96	0.96	0.00	1.00	1.00	1.00	0.83	0.83	0.83
Uniform Delay (d), s/veh	38.3	33.6	0.0	44.1	37.0	0.0	40.1	40.3	40.4	44.1	45.1	45.2
Incr Delay (d2), s/veh	4.0	7.0	0.0	42.3	8.5	0.0	0.9	1.0	1.1	0.5	6.3	9.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	10.0	0.0	3.5	6.1	0.0	2.3	2.6	2.6	1.0	2.1	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.3	40.6	0.0	86.4	45.5	0.0	41.0	41.3	41.5	44.5	51.4	55.1
LnGrp LOS	D	D		F	D		D	D	D	D	D	E
Approach Vol, veh/h	1043		A	596		A	333		209			
Approach Delay, s/veh	40.9			52.1			41.3		51.4			
Approach LOS	D			D			D		D			
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	1.3	30.9		12.3	19.5	22.7		14.8				
Change Period (Y+Rc), s	5.3	5.3		5.3	5.3	5.3		4.6				
Max Green Setting (Gmax), s	6.0	28.5		7.0	6.0	28.5		33.0				
Max Q Clear Time (g_c+11), s	6.0	24.5		6.7	11.2	14.8		7.8				
Green Ext Time (p_c), s	0.0	0.6		0.0	0.0	0.6		0.2				

Intersection Summary

HCM 6th Ctrl Delay	45.0
HCM 6th LOS	D

Notes

- User approved pedestrian interval to be less than phase max green.
- User approved volume balancing among the lanes for turning movement.
- Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary 10: Guerneville Rd & Steele Wy

Lance Drive Residential TIA
Cumulative AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	860	50	70	520	10	30	20	70	460	20	20
Future Volume (veh/h)	30	860	50	70	520	10	30	20	70	460	20	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	34	977	37	80	591	10	28	31	18	539	0	17
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	710	1858	927	218	669	11	112	118	199	603	0	900
Arrive On Green	0.40	0.53	0.53	0.06	0.19	0.19	0.06	0.06	0.06	0.17	0.00	0.17
Sat Flow, veh/h	1767	3526	1571	3428	3546	60	1767	1856	1558	3534	0	1567
Grp Volume(v), veh/h	34	977	37	80	294	307	28	31	18	539	0	17
Grp Sat Flow(s), veh/h/ln	1767	1763	1571	1714	1763	1843	1767	1856	1558	1767	0	1567
Q Serve(g_s), s	1.3	19.9	1.1	2.5	17.8	17.9	1.7	1.8	1.1	16.4	0.0	0.0
Cycle Q Clear(g_c), s	1.3	19.9	1.1	2.5	17.8	17.9	1.7	1.8	1.1	16.4	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.03	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	710	1858	927	218	332	347	112	118	199	603	0	900
V/C Ratio(X)	0.05	0.53	0.04	0.37	0.88	0.88	0.25	0.26	0.09	0.89	0.00	0.02
Avail Cap(c_a), veh/h	710	1858	927	218	476	498	434	455	482	868	0	1017
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.80	0.80	0.80	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	20.1	17.0	9.5	49.4	43.5	43.5	49.0	49.1	42.4	44.6	0.0	10.2
Incr Delay (d2), s/veh	0.0	0.9	0.1	0.4	10.2	9.9	0.4	0.4	0.1	6.7	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	7.9	0.4	1.1	8.6	9.0	0.7	0.8	0.4	7.7	0.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.1	17.9	9.5	49.8	53.6	53.3	49.5	49.5	42.5	51.3	0.0	10.2
LnGrp LOS	C	B	A	D	D	D	D	D	D	D	A	B
Approach Vol, veh/h	1048			681			77			556		
Approach Delay, s/veh	17.7			53.0			47.8			50.1		
Approach LOS	B			D			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	1.9	62.9		23.7	49.1	25.6		11.6				
Change Period (Y+Rc), s	4.9	4.9		4.9	4.9	4.9		4.6				
Max Green Setting (Gmax), s	7.0	29.7		27.0	7.0	29.7		27.0				
Max Q Clear Time (g_c+14), s	14.5	21.9		18.4	3.3	19.9		3.8				
Green Ext Time (p_c), s	0.0	1.1		0.1	0.0	0.5		0.0				

Intersection Summary

HCM 6th Ctrl Delay 36.5

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

11: Cleveland Ave & Guerneville Rd

Lance Drive Residential TIA
Cumulative AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↑↑↓		↰↱	↑↑	↱	↰	↑↓		↰	↑↓	
Traffic Volume (veh/h)	70	1320	40	210	960	230	40	110	170	270	80	50
Future Volume (veh/h)	70	1320	40	210	960	230	40	110	170	270	80	50
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	77	1451	41	231	1055	153	44	121	80	297	88	39
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	250	1535	43	298	1118	488	506	596	365	415	142	63
Arrive On Green	0.07	0.30	0.30	0.09	0.32	0.32	0.29	0.29	0.29	0.12	0.12	0.12
Sat Flow, veh/h	3428	5060	143	3428	3526	1538	1767	2084	1276	3534	1212	537
Grp Volume(v), veh/h	77	968	524	231	1055	153	44	101	100	297	0	127
Grp Sat Flow(s), veh/h/ln	1714	1689	1826	1714	1763	1538	1767	1763	1597	1767	0	1749
Q Serve(g_s), s	2.0	26.6	26.6	6.3	27.7	7.2	1.7	4.1	4.5	7.7	0.0	6.6
Cycle Q Clear(g_c), s	2.0	26.6	26.6	6.3	27.7	7.2	1.7	4.1	4.5	7.7	0.0	6.6
Prop In Lane	1.00		0.08	1.00		1.00	1.00		0.80	1.00		0.31
Lane Grp Cap(c), veh/h	250	1024	554	298	1118	488	506	504	457	415	0	205
V/C Ratio(X)	0.31	0.95	0.95	0.78	0.94	0.31	0.09	0.20	0.22	0.72	0.00	0.62
Avail Cap(c_a), veh/h	253	1034	559	328	1158	505	506	504	457	1008	0	499
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.71	0.71	0.71	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	41.8	32.3	32.3	42.5	31.6	24.6	24.8	25.7	25.8	40.4	0.0	39.9
Incr Delay (d2), s/veh	0.3	16.2	24.8	6.3	11.1	0.1	0.3	0.9	1.1	0.9	0.0	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	12.7	15.0	2.9	12.9	2.5	0.8	1.8	1.8	3.3	0.0	2.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.0	48.5	57.1	48.8	42.7	24.7	25.2	26.6	26.9	41.3	0.0	41.0
LnGrp LOS	D	D	E	D	D	C	C	C	C	D	A	D
Approach Vol, veh/h	1569			1439			245			424		
Approach Delay, s/veh	51.1			41.8			26.5			41.2		
Approach LOS	D			D			C			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	33.2	33.7		32.1	11.8	35.0		16.1				
Change Period (Y+Rc), s	4.9	4.9		4.9	4.9	4.9		4.9				
Max Green Setting (Gmax), s	29.1			10.1	7.0	31.2		27.1				
Max Q Clear Time (g_c+1/3), s	28.6			6.5	4.0	29.7		9.7				
Green Ext Time (p_c), s	0.0	0.2		0.1	0.0	0.4		0.1				

Intersection Summary

HCM 6th Ctrl Delay 44.6

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 12: US 101 SB Ramps & Guerneville Rd

Lance Drive Residential TIA
Cumulative AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑					↑	↑	↑
Traffic Volume (veh/h)	0	1180	580	310	1070	0	0	0	0	420	10	320
Future Volume (veh/h)	0	1180	580	310	1070	0	0	0	0	420	10	320
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1856	1856	1856	1856	0				1856	1856	1856
Adj Flow Rate, veh/h	0	1326	242	348	1202	0				480	0	303
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89				0.89	0.89	0.89
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	1475	450	414	1634	0				1543	0	686
Arrive On Green	0.00	0.29	0.29	0.12	0.46	0.00				0.44	0.00	0.44
Sat Flow, veh/h	0	5233	1545	3428	3618	0				3534	0	1572
Grp Volume(v), veh/h	0	1326	242	348	1202	0				480	0	303
Grp Sat Flow(s),veh/h/ln	0	1689	1545	1714	1763	0				1767	0	1572
Q Serve(g_s), s	0.0	23.9	12.5	9.4	26.4	0.0				8.4	0.0	12.8
Cycle Q Clear(g_c), s	0.0	23.9	12.5	9.4	26.4	0.0				8.4	0.0	12.8
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1475	450	414	1634	0				1543	0	686
V/C Ratio(X)	0.00	0.90	0.54	0.84	0.74	0.00				0.31	0.00	0.44
Avail Cap(c_a), veh/h	0	1925	587	545	2082	0				1543	0	686
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.20	0.20	0.68	0.68	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	32.3	28.3	40.9	20.7	0.0				17.5	0.0	18.7
Incr Delay (d2), s/veh	0.0	0.9	0.1	4.9	0.5	0.0				0.5	0.0	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	9.5	4.5	4.2	10.2	0.0				3.3	0.0	4.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	33.2	28.4	45.8	21.2	0.0				18.0	0.0	20.7
LnGrp LOS	A	C	C	D	C	A				B	A	C
Approach Vol, veh/h		1568			1550						783	
Approach Delay, s/veh		32.5			26.7						19.0	
Approach LOS		C			C						B	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	6.4	32.6		46.1		48.9						
Change Period (Y+Rc), s	4.9	4.9		4.6		4.9						
Max Green Setting (Gmax), s	5.5	36.1		29.4		56.1						
Max Q Clear Time (g_c+I1), s	11.4	25.9		14.8		28.4						
Green Ext Time (p_c), s	0.0	1.8		0.1		1.8						

Intersection Summary

HCM 6th Ctrl Delay 27.5
HCM 6th LOS C

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 13: US 101 NB Ramps & Guerneville Rd/Steele Ln

Lance Drive Residential TIA
Cumulative AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↑↑			↑↑↑		↰	↰↱	↱			
Traffic Volume (veh/h)	420	1180	0	0	950	250	430	10	500	0	0	0
Future Volume (veh/h)	420	1180	0	0	950	250	430	10	500	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1856	1856	0	0	1856	1856	1856	1856	1856			
Adj Flow Rate, veh/h	472	1326	0	0	1067	252	622	0	291			
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89			
Percent Heavy Veh, %	3	3	0	0	3	3	3	3	3			
Cap, veh/h	1222	2457	0	0	1176	277	718	0	319			
Arrive On Green	0.71	1.00	0.00	0.00	0.29	0.29	0.20	0.00	0.20			
Sat Flow, veh/h	3428	3618	0	0	4239	961	3534	0	1572			
Grp Volume(v), veh/h	472	1326	0	0	885	434	622	0	291			
Grp Sat Flow(s),veh/h/ln	1714	1763	0	0	1689	1655	1767	0	1572			
Q Serve(g_s), s	5.2	0.0	0.0	0.0	24.0	24.0	16.2	0.0	17.2			
Cycle Q Clear(g_c), s	5.2	0.0	0.0	0.0	24.0	24.0	16.2	0.0	17.2			
Prop In Lane	1.00		0.00	0.00		0.58	1.00		1.00			
Lane Grp Cap(c), veh/h	1222	2457	0	0	975	478	718	0	319			
V/C Ratio(X)	0.39	0.54	0.00	0.00	0.91	0.91	0.87	0.00	0.91			
Avail Cap(c_a), veh/h	1222	2457	0	0	1177	577	1094	0	487			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.56	0.56	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	9.5	0.0	0.0	0.0	32.6	32.6	36.6	0.0	37.0			
Incr Delay (d2), s/veh	0.0	0.5	0.0	0.0	8.2	14.9	3.2	0.0	11.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	1.6	0.2	0.0	0.0	10.5	11.2	6.9	0.0	7.3			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	9.6	0.5	0.0	0.0	40.8	47.5	39.8	0.0	48.7			
LnGrp LOS	A	A	A	A	D	D	D	A	D			
Approach Vol, veh/h	1798				1319				913			
Approach Delay, s/veh	2.9				43.0				42.6			
Approach LOS	A				D				D			
Timer - Assigned Phs	2				5		6		8			
Phs Duration (G+Y+Rc), s	71.1				38.8		32.3		23.9			
Change Period (Y+Rc), s	4.9				4.9		4.9		4.6			
Max Green Setting (Gmax), s	56.1				18.1		33.1		29.4			
Max Q Clear Time (g_c+I1), s	2.0				7.2		26.0		19.2			
Green Ext Time (p_c), s	2.0				0.1		1.4		0.1			

Intersection Summary

HCM 6th Ctrl Delay	25.0
HCM 6th LOS	C

Notes










User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

14: Stony Point Rd/Marlow Rd & W College Ave

Lance Drive Residential TIA
Cumulative AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	410	170	180	220	150	90	690	190	200	660	70
Future Volume (veh/h)	90	410	170	180	220	150	90	690	190	200	660	70
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	100	456	151	200	244	73	100	767	128	222	733	71
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	247	568	186	337	726	212	126	860	676	218	959	93
Arrive On Green	0.14	0.22	0.22	0.19	0.27	0.27	0.07	0.24	0.24	0.12	0.30	0.30
Sat Flow, veh/h	1767	2595	852	1767	2688	785	1767	3526	1539	1767	3241	314
Grp Volume(v), veh/h	100	308	299	200	158	159	100	767	128	222	399	405
Grp Sat Flow(s),veh/h/ln	1767	1763	1683	1767	1763	1710	1767	1763	1539	1767	1763	1791
Q Serve(g_s), s	4.9	15.7	16.0	9.8	6.8	7.1	5.3	20.0	2.4	11.7	19.5	19.6
Cycle Q Clear(g_c), s	4.9	15.7	16.0	9.8	6.8	7.1	5.3	20.0	2.4	11.7	19.5	19.6
Prop In Lane	1.00		0.51	1.00		0.46	1.00		1.00	1.00		0.18
Lane Grp Cap(c), veh/h	247	386	368	337	476	462	126	860	676	218	522	530
V/C Ratio(X)	0.41	0.80	0.81	0.59	0.33	0.34	0.79	0.89	0.19	1.02	0.76	0.76
Avail Cap(c_a), veh/h	247	482	461	337	508	493	136	891	689	218	527	536
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.37	0.37	0.37	1.00	1.00	1.00	0.58	0.58	0.58
Uniform Delay (d), s/veh	37.3	35.1	35.2	35.1	27.8	27.9	43.4	34.7	5.6	41.7	30.4	30.4
Incr Delay (d2), s/veh	1.1	7.5	8.5	1.0	0.2	0.2	25.4	11.0	0.1	51.6	3.9	3.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	7.3	7.1	4.2	2.8	2.8	3.1	9.4	0.9	8.0	8.4	8.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.3	42.6	43.7	36.1	28.0	28.1	68.8	45.7	5.7	93.3	34.3	34.3
LnGrp LOS	D	D	D	D	C	C	E	D	A	F	C	C
Approach Vol, veh/h	707				517		995				1026	
Approach Delay, s/veh	42.5				31.1		42.8				47.0	
Approach LOS	D				C		D				D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	83.4	26.1	12.1	33.4	18.6	30.9	17.0	28.5				
Change Period (Y+Rc), s	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3				
Max Green Setting (Gmax), s	26.0	7.3	28.4	10.7	27.4	11.7	24.0					
Max Q Clear Time (g_c+I1), s	18.0	7.3	21.6	6.9	9.1	13.7	22.0					
Green Ext Time (p_c), s	0.0	2.2	0.0	2.6	0.1	1.6	0.0	1.1				

Intersection Summary

HCM 6th Ctrl Delay 42.2

HCM 6th LOS D









Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary 15: N Dutton Ave & W College Ave

Lance Drive Residential TIA
Cumulative AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	110	810	110	100	610	330	90	420	120	230	250	60
Future Volume (veh/h)	110	810	110	100	610	330	90	420	120	230	250	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	118	871	107	108	656	290	97	452	106	247	269	41
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	146	941	116	135	716	317	369	537	125	495	801	120
Arrive On Green	0.08	0.30	0.30	0.08	0.30	0.30	0.21	0.19	0.19	0.28	0.26	0.26
Sat Flow, veh/h	1767	3152	387	1767	2374	1049	1767	2826	657	1767	3064	461
Grp Volume(v), veh/h	118	487	491	108	487	459	97	281	277	247	153	157
Grp Sat Flow(s),veh/h/ln	1767	1763	1777	1767	1763	1660	1767	1763	1721	1767	1763	1762
Q Serve(g_s), s	6.2	25.4	25.4	5.7	25.3	25.3	4.4	14.6	14.8	11.1	6.7	6.9
Cycle Q Clear(g_c), s	6.2	25.4	25.4	5.7	25.3	25.3	4.4	14.6	14.8	11.1	6.7	6.9
Prop In Lane	1.00		0.22	1.00		0.63	1.00		0.38	1.00		0.26
Lane Grp Cap(c), veh/h	146	526	531	135	532	501	369	335	327	495	461	461
V/C Ratio(X)	0.81	0.93	0.93	0.80	0.92	0.92	0.26	0.84	0.85	0.50	0.33	0.34
Avail Cap(c_a), veh/h	167	570	574	167	570	537	369	410	400	495	577	577
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.60	0.60	0.60	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.8	32.3	32.3	43.1	32.0	32.0	31.5	37.1	37.2	28.6	28.4	28.4
Incr Delay (d2), s/veh	12.3	13.3	13.2	15.6	18.2	19.1	0.1	10.2	11.6	0.3	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	12.3	12.4	3.0	13.0	12.4	1.8	7.0	7.1	4.5	2.7	2.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.1	45.6	45.5	58.8	50.2	51.1	31.6	47.3	48.7	28.9	28.5	28.6
LnGrp LOS	E	D	D	E	D	D	C	D	D	C	C	C
Approach Vol, veh/h	1096			1054			655			557		
Approach Delay, s/veh	46.6			51.5			45.6			28.7		
Approach LOS	D			D			D			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	1.2	32.3	22.8	28.7	10.9	32.6	29.6	21.9				
Change Period (Y+Rc), s	3.9	* 3.9	3.0	3.9	3.0	3.9	3.0	3.9				
Max Green Setting (Gmax), s	3.0	* 31	10.4	31.1	9.0	30.7	19.4	22.1				
Max Q Clear Time (g_c+11), s	27.4	27.4	6.4	8.9	8.2	27.3	13.1	16.8				
Green Ext Time (p_c), s	0.0	0.9	0.0	0.5	0.0	0.9	0.1	0.7				

Intersection Summary

HCM 6th Ctrl Delay 45.0

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection

Intersection Delay, s/veh 7.9

Intersection LOS A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	0	10	0	0	10	60	0	0	0	100	0	0
Future Vol, veh/h	0	10	0	0	10	60	0	0	0	100	0	0
Peak Hour Factor	0.66	0.66	0.92	0.92	0.66	0.66	0.92	0.92	0.92	0.66	0.92	0.66
Heavy Vehicles, %	3	3	2	2	3	3	2	2	2	3	2	3
Mvmt Flow	0	15	0	0	15	91	0	0	0	152	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0























Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.5	7.3	0	8.4
HCM LOS	A	A	-	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	0%	0%	100%
Vol Thru, %	100%	100%	14%	0%
Vol Right, %	0%	0%	86%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	0	10	70	100
LT Vol	0	0	0	100
Through Vol	0	10	10	0
RT Vol	0	0	60	0
Lane Flow Rate	0	15	106	152
Geometry Grp	1	1	1	1
Degree of Util (X)	0	0.019	0.112	0.184
Departure Headway (Hd)	4.262	4.413	3.814	4.36
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	0	815	945	820
Service Time	2.353	2.416	1.815	2.406
HCM Lane V/C Ratio	0	0.018	0.112	0.185
HCM Control Delay	7.4	7.5	7.3	8.4
HCM Lane LOS	N	A	A	A
HCM 95th-tile Q	0	0.1	0.4	0.7

HCM 6th Signalized Intersection Summary







1: Marlow Rd & Marlow Ct/W Steele Ln

Lance Drive Residential TIA
Cumulative AM (120 Seconds)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	10	10	260	10	210	10	600	260	160	580	10
Future Volume (veh/h)	10	10	10	260	10	210	10	600	260	160	580	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		1.00	1.00		0.96	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	12	12	2	311	0	154	12	698	209	186	674	12
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	29	29	5	1547	0	879	24	863	1058	218	1248	22
Arrive On Green	0.04	0.04	0.04	0.44	0.00	0.44	0.01	0.24	0.24	0.12	0.35	0.35
Sat Flow, veh/h	822	822	137	3534	0	1565	1767	3526	1508	1767	3543	63
Grp Volume(v), veh/h	26	0	0	311	0	154	12	698	209	186	335	351
Grp Sat Flow(s),veh/h/ln	1781	0	0	1767	0	1565	1767	1763	1508	1767	1763	1844
Q Serve(g_s), s	1.7	0.0	0.0	6.5	0.0	0.0	0.8	22.4	6.1	12.4	18.3	18.3
Cycle Q Clear(g_c), s	1.7	0.0	0.0	6.5	0.0	0.0	0.8	22.4	6.1	12.4	18.3	18.3
Prop In Lane	0.46		0.08	1.00		1.00	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	63	0	0	1547	0	879	24	863	1058	218	621	649
V/C Ratio(X)	0.41	0.00	0.00	0.20	0.00	0.18	0.49	0.81	0.20	0.85	0.54	0.54
Avail Cap(c_a), veh/h	224	0	0	1547	0	879	149	1040	1133	517	883	923
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.55	0.55	0.55	1.00	1.00	1.00
Uniform Delay (d), s/veh	56.6	0.0	0.0	20.8	0.0	12.8	58.8	42.7	7.0	51.5	31.1	31.1
Incr Delay (d2), s/veh	4.2	0.0	0.0	0.3	0.0	0.4	8.3	2.3	0.0	9.1	0.7	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	0.0	2.8	0.0	2.1	0.4	9.9	5.4	6.0	7.8	8.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.8	0.0	0.0	21.1	0.0	13.2	67.1	44.9	7.1	60.6	31.8	31.8
LnGrp LOS	E	A	A	C	A	B	E	D	A	E	C	C
Approach Vol, veh/h		26			465			919			872	
Approach Delay, s/veh		60.8			18.5			36.6			38.0	
Approach LOS		E			B			D			D	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		57.1	6.5	47.1		9.2	19.7	34.0				
Change Period (Y+Rc), s		4.6	4.9	4.9		4.9	4.9	4.6				
Max Green Setting (Gmax), s		15.4	10.1	60.1		15.1	35.1	35.4				
Max Q Clear Time (g_c+I1), s		8.5	2.8	20.3		3.7	14.4	24.4				
Green Ext Time (p_c), s		1.0	0.0	4.6		0.0	0.5	4.1				
Intersection Summary												
HCM 6th Ctrl Delay				33.7								
HCM 6th LOS				C								
Notes												
User approved pedestrian interval to be less than phase max green.												
User approved volume balancing among the lanes for turning movement.												






















HCM 6th TWSC
2: Iroquois St/Apple Valley Ln & W Steele Ln

Lance Drive Residential TIA
Cumulative AM (120 Seconds)

Intersection												
Int Delay, s/veh	6.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	40	420	60	20	360	20	50	10	30	20	10	50
Future Vol, veh/h	40	420	60	20	360	20	50	10	30	20	10	50
Conflicting Peds, #/hr	12	0	24	24	0	12	4	0	4	4	0	4
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	60	-	-	80	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	48	506	72	24	434	24	60	12	36	24	12	60
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	470	0	0	602	0	0	1196	1180	570	1172	1204	462
Stage 1	-	-	-	-	-	-	662	662	-	506	506	-
Stage 2	-	-	-	-	-	-	534	518	-	666	698	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1086	-	-	971	-	-	162	189	519	168	183	598
Stage 1	-	-	-	-	-	-	449	458	-	547	538	-
Stage 2	-	-	-	-	-	-	528	532	-	447	441	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1074	-	-	949	-	-	127	170	505	138	165	589
Mov Cap-2 Maneuver	-	-	-	-	-	-	127	170	-	138	165	-
Stage 1	-	-	-	-	-	-	419	427	-	516	519	-
Stage 2	-	-	-	-	-	-	450	513	-	384	411	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.7			0.4			53.7			25		
HCM LOS							F			D		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	176	1074	-	-	949	-	-	275				
HCM Lane V/C Ratio	0.616	0.045	-	-	0.025	-	-	0.35				
HCM Control Delay (s)	53.7	8.5	-	-	8.9	-	-	25				
HCM Lane LOS	F	A	-	-	A	-	-	D				
HCM 95th %tile Q(veh)	3.4	0.1	-	-	0.1	-	-	1.5				

HCM 6th Signalized Intersection Summary 3: Range Ave & W Steele Ln

Lance Drive Residential TIA
Cumulative AM (120 Seconds)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	490	60	60	320	50	50	210	30	40	180	40
Future Volume (veh/h)	50	490	60	60	320	50	50	210	30	40	180	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.95	1.00		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	57	557	66	68	364	55	57	239	20	45	205	23
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	700	1211	144	546	1169	177	73	420	35	58	403	45
Arrive On Green	0.74	0.74	0.74	0.74	0.74	0.74	0.04	0.13	0.13	0.03	0.13	0.13
Sat Flow, veh/h	959	1627	193	795	1571	237	1767	3282	272	1767	3180	351
Grp Volume(v), veh/h	57	0	623	68	0	419	57	127	132	45	112	116
Grp Sat Flow(s),veh/h/ln	959	0	1820	795	0	1808	1767	1763	1791	1767	1763	1768
Q Serve(g_s), s	2.5	0.0	16.0	4.4	0.0	9.3	3.8	8.1	8.3	3.0	7.1	7.3
Cycle Q Clear(g_c), s	11.8	0.0	16.0	20.3	0.0	9.3	3.8	8.1	8.3	3.0	7.1	7.3
Prop In Lane	1.00		0.11	1.00		0.13	1.00		0.15	1.00		0.20
Lane Grp Cap(c), veh/h	700	0	1355	546	0	1346	73	226	229	58	223	224
V/C Ratio(X)	0.08	0.00	0.46	0.12	0.00	0.31	0.78	0.56	0.57	0.78	0.50	0.52
Avail Cap(c_a), veh/h	700	0	1355	546	0	1346	162	413	419	147	398	399
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.78	0.78	0.78	1.00	1.00	1.00
Uniform Delay (d), s/veh	7.1	0.0	6.0	9.9	0.0	5.1	57.0	49.2	49.2	57.6	48.9	49.0
Incr Delay (d2), s/veh	0.2	0.0	1.1	0.5	0.0	0.6	5.2	0.6	0.7	8.2	0.6	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	5.5	0.8	0.0	3.2	1.8	3.6	3.7	1.5	3.1	3.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	7.3	0.0	7.1	10.4	0.0	5.7	62.1	49.8	49.9	65.8	49.5	49.6
LnGrp LOS	A	A	A	B	A	A	E	D	D	E	D	D
Approach Vol, veh/h		680			487			316			273	
Approach Delay, s/veh		7.1			6.4			52.1			52.3	
Approach LOS		A			A			D			D	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		92.9	8.0	19.1		92.9	7.8	19.3				
Change Period (Y+Rc), s		3.6	3.0	3.9		3.6	3.9	* 3.9				
Max Green Setting (Gmax), s		71.4	11.0	27.1		71.4	10.0	* 28				
Max Q Clear Time (g_c+I1), s		18.0	5.8	9.3		22.3	5.0	10.3				
Green Ext Time (p_c), s		1.5	0.0	0.3		1.1	0.0	0.4				
Intersection Summary												
HCM 6th Ctrl Delay			22.0									
HCM 6th LOS			C									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												











HCM 6th Signalized Intersection Summary

4: Marlow Rd & Guerneville Rd

Lance Drive Residential TIA

Cumulative AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	140	530	170	170	320	110	150	560	200	140	590	100
Future Volume (veh/h)	140	530	170	170	320	110	150	560	200	140	590	100
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	152	576	119	185	348	94	163	609	94	152	641	96
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	180	701	480	214	609	162	192	736	512	245	733	110
Arrive On Green	0.10	0.20	0.20	0.12	0.22	0.22	0.11	0.21	0.21	0.05	0.08	0.08
Sat Flow, veh/h	1767	3526	1558	1767	2748	732	1767	3526	1541	1767	3066	458
Grp Volume(v), veh/h	152	576	119	185	221	221	163	609	94	152	368	369
Grp Sat Flow(s),veh/h/ln	1767	1763	1558	1767	1763	1717	1767	1763	1541	1767	1763	1762
Q Serve(g_s), s	10.1	18.8	2.8	12.3	13.4	13.8	10.9	19.8	0.0	10.1	24.8	24.9
Cycle Q Clear(g_c), s	10.1	18.8	2.8	12.3	13.4	13.8	10.9	19.8	0.0	10.1	24.8	24.9
Prop In Lane	1.00		1.00	1.00		0.43	1.00		1.00	1.00		0.26
Lane Grp Cap(c), veh/h	180	701	480	214	390	380	192	736	512	245	422	421
V/C Ratio(X)	0.85	0.82	0.25	0.87	0.57	0.58	0.85	0.83	0.18	0.62	0.87	0.88
Avail Cap(c_a), veh/h	246	861	551	290	474	462	275	961	610	246	451	451
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	0.99	0.99	0.99	0.44	0.44	0.44	0.90	0.90	0.90
Uniform Delay (d), s/veh	53.0	46.0	7.1	51.8	41.6	41.7	52.5	45.4	28.7	54.1	53.5	53.5
Incr Delay (d2), s/veh	17.5	5.3	0.3	17.9	5.8	6.3	7.6	2.1	0.1	4.2	14.9	15.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.3	8.6	1.8	6.4	6.4	6.4	5.1	8.7	1.9	5.1	13.5	13.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	70.5	51.3	7.3	69.6	47.4	48.0	60.2	47.6	28.8	58.3	68.4	68.7
LnGrp LOS	E	D	A	E	D	D	E	D	C	E	E	E
Approach Vol, veh/h	847		627			866		889				
Approach Delay, s/veh	48.6		54.2			47.9		66.8				
Approach LOS	D		D			D		E				
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	30.2	29.6	18.3	34.0	17.5	32.3	22.0	30.3				
Change Period (Y+Rc), s	5.7	* 5.7	5.3	5.3	5.3	5.7	5.3	5.3				
Max Green Setting (Gmax), s	29.8	* 29	18.7	30.7	16.7	32.3	16.7	32.7				
Max Q Clear Time (g_c+14.3), s	20.8	20.8	12.9	26.9	12.1	15.8	12.1	21.8				
Green Ext Time (p_c), s	0.2	2.6	0.2	1.6	0.1	2.2	0.1	3.1				

Intersection Summary

HCM 6th Ctrl Delay 54.5

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary 5: Ridley Ave & Guerneville Rd

Lance Drive Residential TIA
Cumulative AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	810	30	70	520	20	50	10	70	40	10	30
Future Volume (veh/h)	30	810	30	70	520	20	50	10	70	40	10	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	0.98		0.97	0.99		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	34	910	33	79	584	21	56	11	31	45	11	9
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	666	2893	105	517	2896	104	131	31	53	153	37	22
Arrive On Green	0.83	0.83	0.83	0.56	0.56	0.56	0.11	0.11	0.11	0.11	0.11	0.11
Sat Flow, veh/h	807	3466	126	589	3471	125	780	290	495	950	339	207
Grp Volume(v), veh/h	34	463	480	79	296	309	98	0	0	65	0	0
Grp Sat Flow(s),veh/h/ln	807	1763	1829	589	1763	1832	1565	0	0	1496	0	0
Q Serve(g_s), s	1.3	7.1	7.1	8.5	10.0	10.0	2.1	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	11.4	7.1	7.1	15.6	10.0	10.0	6.7	0.0	0.0	4.6	0.0	0.0
Prop In Lane	1.00		0.07	1.00		0.07	0.57		0.32	0.69		0.14
Lane Grp Cap(c), veh/h	666	1471	1526	517	1471	1529	216	0	0	212	0	0
V/C Ratio(X)	0.05	0.31	0.31	0.15	0.20	0.20	0.45	0.00	0.00	0.31	0.00	0.00
Avail Cap(c_a), veh/h	666	1471	1526	517	1471	1529	531	0	0	523	0	0
HCM Platoon Ratio	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.86	0.86	0.86	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	3.9	2.2	2.2	9.7	6.6	6.6	50.6	0.0	0.0	49.7	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.5	0.5	0.1	0.0	0.0	0.6	0.0	0.0	0.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	1.6	1.6	1.2	3.1	3.3	2.8	0.0	0.0	1.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	4.0	2.7	2.7	9.7	6.6	6.6	51.1	0.0	0.0	50.0	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	D	A	A	D	A	A
Approach Vol, veh/h	977			684			98			65		
Approach Delay, s/veh	2.7			7.0			51.1			50.0		
Approach LOS	A			A			D			D		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	104.0			16.0			104.0			16.0		
Change Period (Y+Rc), s	3.9			3.0			3.9			3.0		
Max Green Setting (Gmax), s	74.1			39.0			74.1			39.0		
Max Q Clear Time (g_c+I1), s	13.4			6.6			17.6			8.7		
Green Ext Time (p_c), s	1.9			0.2			1.5			0.3		

Intersection Summary

HCM 6th Ctrl Delay	8.6
HCM 6th LOS	A

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

6: Lance Dr & Guerneville Rd

Lance Drive Residential TIA

Cumulative AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	850	30	30	520	60	20	60	80	70	100	70
Future Volume (veh/h)	30	850	30	30	520	60	20	60	80	70	100	70
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.99	0.99		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	36	1012	35	36	619	51	24	71	59	83	119	68
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	62	1087	38	72	1124	490	64	168	123	121	147	77
Arrive On Green	0.01	0.10	0.10	0.08	0.64	0.64	0.20	0.20	0.20	0.20	0.20	0.20
Sat Flow, veh/h	1767	3473	120	1767	3526	1537	150	857	625	419	747	392
Grp Volume(v), veh/h	36	514	533	36	619	51	154	0	0	270	0	0
Grp Sat Flow(s), veh/h/ln	1767	1763	1831	1767	1763	1537	1633	0	0	1558	0	0
Q Serve(g_s), s	2.4	34.7	34.7	2.3	11.8	1.5	0.0	0.0	0.0	10.7	0.0	0.0
Cycle Q Clear(g_c), s	2.4	34.7	34.7	2.3	11.8	1.5	9.5	0.0	0.0	20.2	0.0	0.0
Prop In Lane	1.00		0.07	1.00		1.00	0.16		0.38	0.31		0.25
Lane Grp Cap(c), veh/h	62	552	573	72	1124	490	355	0	0	345	0	0
V/C Ratio(X)	0.58	0.93	0.93	0.50	0.55	0.10	0.43	0.00	0.00	0.78	0.00	0.00
Avail Cap(c_a), veh/h	143	804	834	158	1636	713	566	0	0	549	0	0
HCM Platoon Ratio	0.33	0.33	0.33	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.97	0.97	0.97	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	58.4	52.5	52.5	53.9	17.0	15.1	42.6	0.0	0.0	46.8	0.0	0.0
Incr Delay (d2), s/veh	3.2	11.0	10.6	1.9	1.9	0.4	0.3	0.0	0.0	1.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	18.0	18.7	1.0	3.8	0.6	4.1	0.0	0.0	8.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.6	63.5	63.2	55.9	18.8	15.5	42.9	0.0	0.0	48.2	0.0	0.0
LnGrp LOS	E	E	E	E	B	B	D	A	A	D	A	A
Approach Vol, veh/h	1083			706			154			270		
Approach Delay, s/veh	63.3			20.5			42.9			48.2		
Approach LOS	E			C			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	40.2	42.8		28.1	9.5	43.5		28.1				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		4.6				
Max Green Setting (Gmax), s	40.2	54.7		39.4	9.7	55.7		39.4				
Max Q Clear Time (g_c+14.3), s	14.3	36.7		22.2	4.4	13.8		11.5				
Green Ext Time (p_c), s	0.0	0.9		0.3	0.0	0.7		0.2				

Intersection Summary

HCM 6th Ctrl Delay 46.4

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

7: N Dutton Ave/Westberry Dr & Guerneville Rd

Lance Drive Residential TIA
Cumulative AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	980	120	290	540	10	100	10	440	30	10	10
Future Volume (veh/h)	10	980	120	290	540	10	100	10	440	30	10	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	12	1181	139	349	651	11	129	0	219	36	12	1
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	29	1200	141	1194	2518	43	186	0	630	65	22	2
Arrive On Green	0.02	0.38	0.38	0.70	1.00	1.00	0.05	0.00	0.05	0.05	0.05	0.05
Sat Flow, veh/h	1767	3171	372	3428	3546	60	3534	0	1564	1310	437	36
Grp Volume(v), veh/h	12	655	665	349	324	338	129	0	219	49	0	0
Grp Sat Flow(s), veh/h/ln	1767	1763	1780	1714	1763	1843	1767	0	1564	1782	0	0
Q Serve(g_s), s	0.8	44.1	44.5	4.7	0.0	0.0	4.3	0.0	0.0	3.2	0.0	0.0
Cycle Q Clear(g_c), s	0.8	44.1	44.5	4.7	0.0	0.0	4.3	0.0	0.0	3.2	0.0	0.0
Prop In Lane	1.00		0.21	1.00		0.03	1.00		1.00	0.73		0.02
Lane Grp Cap(c), veh/h	29	667	674	1194	1252	1309	186	0	630	89	0	0
V/C Ratio(X)	0.41	0.98	0.99	0.29	0.26	0.26	0.69	0.00	0.35	0.55	0.00	0.00
Avail Cap(c_a), veh/h	90	667	674	1194	1252	1309	265	0	665	377	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.88	0.88	0.88	0.91	0.91	0.91	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	58.4	36.9	37.0	12.6	0.0	0.0	55.9	0.0	25.0	55.7	0.0	0.0
Incr Delay (d2), s/veh	3.0	28.6	29.6	0.0	0.5	0.4	1.7	0.0	0.1	2.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	23.4	24.0	1.6	0.2	0.2	1.9	0.0	4.2	1.5	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.4	65.5	66.6	12.6	0.5	0.4	57.6	0.0	25.1	57.7	0.0	0.0
LnGrp LOS	E	E	E	B	A	A	E	A	C	E	A	A
Approach Vol, veh/h	1332			1011			348			49		
Approach Delay, s/veh	66.0			4.6			37.2			57.7		
Approach LOS	E			A			D			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	47.1	50.7		10.6	7.3	90.5		11.6				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		5.3				
Max Green Setting (Gmax), s	45.4	45.4		25.4	6.1	59.0		9.0				
Max Q Clear Time (g_c+10), s	46.5	46.5		5.2	2.8	2.0		6.3				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	0.5		0.0				

Intersection Summary

HCM 6th Ctrl Delay 39.6

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 8: Herbert St/Coffey Ln & Guerneville Rd

Lance Drive Residential TIA
Cumulative AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	150	1250	40	30	620	50	30	20	20	90	10	180
Future Volume (veh/h)	150	1250	40	30	620	50	30	20	20	90	10	180
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		0.95	1.00		0.94	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	174	1453	46	35	721	55	35	23	6	105	12	62
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	197	1274	40	534	1839	140	64	42	11	156	18	324
Arrive On Green	0.22	0.73	0.73	0.60	1.00	1.00	0.07	0.07	0.07	0.10	0.10	0.10
Sat Flow, veh/h	1767	3482	110	1767	3307	252	965	634	165	1594	182	1513
Grp Volume(v), veh/h	174	734	765	35	384	392	64	0	0	117	0	62
Grp Sat Flow(s), veh/h/ln	1767	1763	1829	1767	1763	1796	1765	0	0	1776	0	1513
Q Serve(g_s), s	11.4	43.9	43.9	1.0	0.0	0.0	4.2	0.0	0.0	7.6	0.0	4.1
Cycle Q Clear(g_c), s	11.4	43.9	43.9	1.0	0.0	0.0	4.2	0.0	0.0	7.6	0.0	4.1
Prop In Lane	1.00		0.06	1.00		0.14	0.55		0.09	0.90		1.00
Lane Grp Cap(c), veh/h	197	645	669	534	980	999	118	0	0	174	0	324
V/C Ratio(X)	0.88	1.14	1.14	0.07	0.39	0.39	0.54	0.00	0.00	0.67	0.00	0.19
Avail Cap(c_a), veh/h	199	645	669	534	980	999	368	0	0	385	0	503
HCM Platoon Ratio	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.60	0.60	0.60	0.90	0.90	0.90	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	45.8	16.1	16.1	16.8	0.0	0.0	54.2	0.0	0.0	52.2	0.0	39.1
Incr Delay (d2), s/veh	22.3	73.9	75.4	0.0	1.1	1.0	1.4	0.0	0.0	1.7	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.6	19.0	20.0	0.4	0.3	0.3	1.9	0.0	0.0	3.5	0.0	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	68.1	90.0	91.5	16.8	1.1	1.0	55.7	0.0	0.0	53.9	0.0	39.2
LnGrp LOS	E	F	F	B	A	A	E	A	A	D	A	D
Approach Vol, veh/h	1673			811			64			179		
Approach Delay, s/veh	88.4			1.7			55.7			48.8		
Approach LOS	F			A			E			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	41.5	49.2		16.7	18.7	72.0		12.6				
Change Period (Y+Rc), s	5.3	5.3		4.9	5.3	5.3		4.6				
Max Green Setting (Gmax), s	5.0	43.9		26.0	13.5	35.4		25.0				
Max Q Clear Time (g_c+13), s	5.0	45.9		9.6	13.4	2.0		6.2				
Green Ext Time (p_c), s	0.0	0.0		0.1	0.0	0.6		0.1				

Intersection Summary

HCM 6th Ctrl Delay 59.3

HCM 6th LOS E

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

9: Range Ave & Guerneville Rd

Lance Drive Residential TIA
Cumulative AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	170	810	180	90	470	10	160	110	90	40	120	130
Future Volume (veh/h)	170	810	180	90	470	10	160	110	90	40	120	130
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.96	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No		No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	181	862	0	96	500	0	102	212	19	43	128	29
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	267	908		119	613		152	287	25	112	181	40
Arrive On Green	0.30	0.51	0.00	0.07	0.17	0.00	0.09	0.09	0.09	0.02	0.02	0.02
Sat Flow, veh/h	1767	3618	0	1767	3618	0	1767	3347	296	1767	2847	622
Grp Volume(v), veh/h	181	862	0	96	500	0	102	116	115	43	77	80
Grp Sat Flow(s), veh/h/ln	1767	1763	0	1767	1763	0	1767	1856	1788	1767	1763	1707
Q Serve(g_s), s	10.8	27.9	0.0	6.4	16.4	0.0	6.7	7.3	7.5	2.9	5.2	5.6
Cycle Q Clear(g_c), s	10.8	27.9	0.0	6.4	16.4	0.0	6.7	7.3	7.5	2.9	5.2	5.6
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.17	1.00		0.36
Lane Grp Cap(c), veh/h	267	908		119	613		152	159	153	112	112	108
V/C Ratio(X)	0.68	0.95		0.81	0.82		0.67	0.73	0.75	0.38	0.69	0.73
Avail Cap(c_a), veh/h	437	1548		246	1166		227	238	229	216	216	209
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	0.69	0.69	0.00	0.96	0.96	0.00	1.00	1.00	1.00	0.79	0.79	0.79
Uniform Delay (d), s/veh	39.3	28.4	0.0	55.2	47.7	0.0	53.2	53.5	53.6	56.4	57.6	57.7
Incr Delay (d2), s/veh	0.8	4.0	0.0	4.6	11.0	0.0	1.9	2.4	2.7	0.6	2.3	2.8
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	4.1	8.5	0.0	3.0	8.1	0.0	3.1	3.5	3.5	1.3	2.4	2.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	40.1	32.4	0.0	59.7	58.8	0.0	55.2	55.9	56.3	57.1	59.8	60.6
LnGrp LOS	D	C		E	E		E	E	E	E	E	E
Approach Vol, veh/h	1043		A		596		A		333		200	
Approach Delay, s/veh	33.7				58.9				55.8		59.5	
Approach LOS	C				E				E		E	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	3.4	36.2		12.9	23.4	26.2		14.9				
Change Period (Y+Rc), s	5.3	5.3		5.3	5.3	5.3		4.6				
Max Green Setting (Gmax), s	6.3	52.7		14.7	29.7	39.7		15.4				
Max Q Clear Time (g_c+1/3), s	13.4	29.9		7.6	12.8	18.4		9.5				
Green Ext Time (p_c), s	0.0	1.0		0.1	0.0	0.6		0.1				

Intersection Summary

HCM 6th Ctrl Delay 46.4
HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

10: Guerneville Rd & Steele Wy

Lance Drive Residential TIA
Cumulative AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	860	50	70	520	10	30	20	70	460	20	20
Future Volume (veh/h)	30	860	50	70	520	10	30	20	70	460	20	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	34	977	37	80	591	10	28	31	18	539	0	17
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	750	1947	961	200	661	11	105	111	184	597	0	932
Arrive On Green	0.42	0.55	0.55	0.06	0.19	0.19	0.06	0.06	0.06	0.17	0.00	0.17
Sat Flow, veh/h	1767	3526	1571	3428	3546	60	1767	1856	1557	3534	0	1567
Grp Volume(v), veh/h	34	977	37	80	294	307	28	31	18	539	0	17
Grp Sat Flow(s), veh/h/ln	1767	1763	1571	1714	1763	1843	1767	1856	1557	1767	0	1567
Q Serve(g_s), s	1.4	20.6	1.1	2.7	19.5	19.5	1.8	1.9	1.2	17.9	0.0	0.0
Cycle Q Clear(g_c), s	1.4	20.6	1.1	2.7	19.5	19.5	1.8	1.9	1.2	17.9	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.03	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	750	1947	961	200	329	344	105	111	184	597	0	932
V/C Ratio(X)	0.05	0.50	0.04	0.40	0.89	0.89	0.27	0.28	0.10	0.90	0.00	0.02
Avail Cap(c_a), veh/h	750	1947	961	203	580	607	398	417	442	798	0	1021
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.84	0.84	0.84	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	20.3	16.6	9.3	54.5	47.6	47.7	53.9	54.0	47.2	48.9	0.0	10.0
Incr Delay (d2), s/veh	0.0	0.8	0.1	0.5	3.9	3.8	0.5	0.5	0.1	9.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	8.2	0.5	1.2	8.8	9.2	0.8	0.9	0.5	8.7	0.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.3	17.4	9.3	55.0	51.5	51.4	54.4	54.5	47.3	58.2	0.0	10.0
LnGrp LOS	C	B	A	D	D	D	D	D	D	E	A	B
Approach Vol, veh/h	1048			681			77			556		
Approach Delay, s/veh	17.2			51.9			52.8			56.7		
Approach LOS	B			D			D			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	1.9	71.2		25.2	55.8	27.3		11.7				
Change Period (Y+Rc), s	4.9	4.9		4.9	4.9	4.9		4.6				
Max Green Setting (Gmax), s	39.5			27.1	7.1	39.5		27.0				
Max Q Clear Time (g_c+14), s	22.6			19.9	3.4	21.5		3.9				
Green Ext Time (p_c), s	0.0	1.3		0.1	0.0	0.5		0.0				

Intersection Summary

HCM 6th Ctrl Delay 37.7

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

11: Cleveland Ave & Guerneville Rd

Lance Drive Residential TIA
Cumulative AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↑↑↑		↔↔	↑↑	↔	↔	↑↑		↔	↔↔	
Traffic Volume (veh/h)	70	1320	40	210	960	230	40	110	170	270	80	50
Future Volume (veh/h)	70	1320	40	210	960	230	40	110	170	270	80	50
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	77	1451	41	231	1055	153	44	121	80	297	88	39
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	246	1556	44	285	1124	490	591	698	427	394	135	60
Arrive On Green	0.07	0.31	0.31	0.08	0.32	0.32	0.33	0.33	0.33	0.11	0.11	0.11
Sat Flow, veh/h	3428	5060	143	3428	3526	1538	1767	2085	1276	3534	1212	537
Grp Volume(v), veh/h	77	968	524	231	1055	153	44	101	100	297	0	127
Grp Sat Flow(s), veh/h/ln	1714	1689	1826	1714	1763	1538	1767	1763	1598	1767	0	1748
Q Serve(g_s), s	2.6	33.4	33.4	8.0	34.9	9.0	2.0	4.8	5.3	9.8	0.0	8.4
Cycle Q Clear(g_c), s	2.6	33.4	33.4	8.0	34.9	9.0	2.0	4.8	5.3	9.8	0.0	8.4
Prop In Lane	1.00		0.08	1.00		1.00	1.00		0.80	1.00		0.31
Lane Grp Cap(c), veh/h	246	1039	562	285	1124	490	591	590	535	394	0	195
V/C Ratio(X)	0.31	0.93	0.93	0.81	0.94	0.31	0.07	0.17	0.19	0.75	0.00	0.65
Avail Cap(c_a), veh/h	246	1185	641	374	1413	617	591	590	535	857	0	424
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.69	0.69	0.69	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	52.9	40.3	40.3	54.1	39.7	30.9	27.2	28.2	28.3	51.7	0.0	51.1
Incr Delay (d2), s/veh	0.3	11.5	18.3	5.2	7.2	0.1	0.2	0.6	0.8	1.1	0.0	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	15.2	17.5	3.6	15.9	3.3	0.9	2.2	2.2	4.4	0.0	3.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	53.1	51.8	58.6	59.3	46.9	31.0	27.5	28.8	29.1	52.8	0.0	52.4
LnGrp LOS	D	D	E	E	D	C	C	C	C	D	A	D
Approach Vol, veh/h	1569			1439			245			424		
Approach Delay, s/veh	54.2			47.2			28.7			52.7		
Approach LOS	D			D			C			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.9	41.8		45.1	13.5	43.1		18.3				
Change Period (Y+Rc), s	4.9	4.9		4.9	4.9	4.9		4.9				
Max Green Setting (Gmax), s	42.1			16.1	7.1	48.1		29.1				
Max Q Clear Time (g_c+I10), s	35.4			7.3	4.6	36.9		11.8				
Green Ext Time (p_c), s	0.0	1.5		0.1	0.0	1.3		0.1				

Intersection Summary

HCM 6th Ctrl Delay 49.6

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

12: US 101 SB Ramps & Guerneville Rd

Lance Drive Residential TIA
Cumulative AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑					↑	↑	↑
Traffic Volume (veh/h)	0	1180	580	310	1070	0	0	0	0	420	10	320
Future Volume (veh/h)	0	1180	580	310	1070	0	0	0	0	420	10	320
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1856	1856	1856	1856	0				1856	1856	1856
Adj Flow Rate, veh/h	0	1326	242	348	1202	0				480	0	303
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89				0.89	0.89	0.89
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	1448	442	400	1564	0				1687	0	751
Arrive On Green	0.00	0.29	0.29	0.12	0.44	0.00				0.48	0.00	0.48
Sat Flow, veh/h	0	5233	1545	3428	3618	0				3534	0	1572
Grp Volume(v), veh/h	0	1326	242	348	1202	0				480	0	303
Grp Sat Flow(s),veh/h/ln	0	1689	1545	1714	1763	0				1767	0	1572
Q Serve(g_s), s	0.0	30.4	15.9	12.0	34.5	0.0				9.9	0.0	15.0
Cycle Q Clear(g_c), s	0.0	30.4	15.9	12.0	34.5	0.0				9.9	0.0	15.0
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1448	442	400	1564	0				1687	0	751
V/C Ratio(X)	0.00	0.92	0.55	0.87	0.77	0.00				0.28	0.00	0.40
Avail Cap(c_a), veh/h	0	2030	619	546	2118	0				1687	0	751
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.30	0.30	0.72	0.72	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	41.4	36.3	52.1	28.2	0.0				19.0	0.0	20.3
Incr Delay (d2), s/veh	0.0	1.4	0.1	6.5	0.6	0.0				0.4	0.0	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	12.6	6.0	5.5	14.2	0.0				3.9	0.0	5.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	42.8	36.4	58.6	28.7	0.0				19.4	0.0	21.9
LnGrp LOS	A	D	D	E	C	A				B	A	C
Approach Vol, veh/h		1568			1550						783	
Approach Delay, s/veh		41.9			35.4						20.4	
Approach LOS		D			D						C	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	8.9	39.2		61.9		58.1						
Change Period (Y+Rc), s	4.9	4.9		4.6		4.9						
Max Green Setting (Gmax), s	48.1			38.4		72.1						
Max Q Clear Time (g_c+14), s	32.4			17.0		36.5						
Green Ext Time (p_c), s	0.0	1.9		0.1		1.8						

Intersection Summary

HCM 6th Ctrl Delay 35.0
HCM 6th LOS C

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 13: US 101 NB Ramps & Guerneville Rd/Steele Ln

Lance Drive Residential TIA
Cumulative AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↑↑			↑↑↑		↰	↰↱	↱			
Traffic Volume (veh/h)	420	1180	0	0	950	250	430	10	500	0	0	0
Future Volume (veh/h)	420	1180	0	0	950	250	430	10	500	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1856	1856	0	0	1856	1856	1856	1856	1856			
Adj Flow Rate, veh/h	472	1326	0	0	1067	252	622	0	291			
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89			
Percent Heavy Veh, %	3	3	0	0	3	3	3	3	3			
Cap, veh/h	1359	2544	0	0	1157	273	704	0	313			
Arrive On Green	0.79	1.00	0.00	0.00	0.28	0.28	0.20	0.00	0.20			
Sat Flow, veh/h	3428	3618	0	0	4238	961	3534	0	1572			
Grp Volume(v), veh/h	472	1326	0	0	885	434	622	0	291			
Grp Sat Flow(s),veh/h/ln	1714	1763	0	0	1689	1655	1767	0	1572			
Q Serve(g_s), s	4.7	0.0	0.0	0.0	30.5	30.5	20.5	0.0	21.8			
Cycle Q Clear(g_c), s	4.7	0.0	0.0	0.0	30.5	30.5	20.5	0.0	21.8			
Prop In Lane	1.00		0.00	0.00		0.58	1.00		1.00			
Lane Grp Cap(c), veh/h	1359	2544	0	0	960	470	704	0	313			
V/C Ratio(X)	0.35	0.52	0.00	0.00	0.92	0.92	0.88	0.00	0.93			
Avail Cap(c_a), veh/h	1359	2544	0	0	1185	581	1160	0	516			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.55	0.55	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	8.0	0.0	0.0	0.0	41.7	41.7	46.7	0.0	47.2			
Incr Delay (d2), s/veh	0.0	0.4	0.0	0.0	9.3	16.6	2.7	0.0	11.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	1.5	0.1	0.0	0.0	13.7	14.4	9.0	0.0	9.2			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	8.0	0.4	0.0	0.0	51.0	58.2	49.4	0.0	58.2			
LnGrp LOS	A	A	A	A	D	E	D	A	E			
Approach Vol, veh/h	1798			1319			913					
Approach Delay, s/veh	2.4			53.4			52.2					
Approach LOS	A			D			D					
Timer - Assigned Phs	2			5			6			8		
Phs Duration (G+Y+Rc), s	91.5			52.5			39.0			28.5		
Change Period (Y+Rc), s	4.9			4.9			4.9			4.6		
Max Green Setting (Gmax), s	71.1			24.1			42.1			39.4		
Max Q Clear Time (g_c+I1), s	2.0			6.7			32.5			23.8		
Green Ext Time (p_c), s	2.0			0.1			1.6			0.1		

Intersection Summary

HCM 6th Ctrl Delay	30.4
HCM 6th LOS	C










Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 14: Stony Point Rd/Marlow Rd & W College Ave

Lance Drive Residential TIA
Cumulative AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	410	170	180	220	150	90	690	190	200	660	70
Future Volume (veh/h)	90	410	170	180	220	150	90	690	190	200	660	70
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	100	456	151	200	244	73	100	767	128	222	733	71
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	336	521	171	425	675	197	124	846	748	251	1010	98
Arrive On Green	0.19	0.20	0.20	0.24	0.25	0.25	0.07	0.24	0.24	0.14	0.31	0.31
Sat Flow, veh/h	1767	2594	851	1767	2687	785	1767	3526	1539	1767	3241	314
Grp Volume(v), veh/h	100	309	298	200	158	159	100	767	128	222	399	405
Grp Sat Flow(s),veh/h/ln	1767	1763	1683	1767	1763	1710	1767	1763	1539	1767	1763	1792
Q Serve(g_s), s	5.8	20.3	20.7	11.6	8.8	9.2	6.7	25.4	2.7	14.8	24.1	24.2
Cycle Q Clear(g_c), s	5.8	20.3	20.7	11.6	8.8	9.2	6.7	25.4	2.7	14.8	24.1	24.2
Prop In Lane	1.00		0.51	1.00		0.46	1.00		1.00	1.00		0.18
Lane Grp Cap(c), veh/h	336	354	338	425	443	429	124	846	748	251	549	558
V/C Ratio(X)	0.30	0.87	0.88	0.47	0.36	0.37	0.80	0.91	0.17	0.89	0.73	0.73
Avail Cap(c_a), veh/h	336	383	366	425	504	489	180	887	765	314	577	587
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.39	0.39	0.39	1.00	1.00	1.00	0.57	0.57	0.57
Uniform Delay (d), s/veh	41.7	46.4	46.6	39.0	37.0	37.1	55.0	44.3	6.2	50.5	36.7	36.7
Incr Delay (d2), s/veh	0.5	18.2	20.5	0.3	0.2	0.2	15.5	12.5	0.1	13.5	2.5	2.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	10.5	10.4	5.0	3.8	3.8	3.5	12.2	1.1	7.4	10.5	10.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.2	64.6	67.1	39.4	37.2	37.3	70.4	56.8	6.3	64.1	39.2	39.2
LnGrp LOS	D	E	E	D	D	D	E	E	A	E	D	D
Approach Vol, veh/h	707			517			995			1026		
Approach Delay, s/veh	62.5			38.0			51.6			44.6		
Approach LOS	E			D			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	34.2	29.4	13.7	42.7	28.1	35.4	22.3	34.1				
Change Period (Y+Rc), s	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3				
Max Green Setting (Gmax), s	21.8	26.1	12.2	39.3	13.0	34.3	21.3	30.2				
Max Q Clear Time (g_c+I1), s	13.6	22.7	8.7	26.2	7.8	11.2	16.8	27.4				
Green Ext Time (p_c), s	0.3	1.2	0.1	3.9	0.1	1.7	0.2	1.5				

Intersection Summary

HCM 6th Ctrl Delay 49.6

HCM 6th LOS D









Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary 15: N Dutton Ave & W College Ave

Lance Drive Residential TIA
Cumulative AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	110	810	110	100	610	330	90	420	120	230	250	60
Future Volume (veh/h)	110	810	110	100	610	330	90	420	120	230	250	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	118	871	107	108	656	290	97	452	106	247	269	41
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	143	938	115	132	710	314	456	510	119	574	758	114
Arrive On Green	0.08	0.30	0.30	0.07	0.30	0.30	0.26	0.18	0.18	0.32	0.25	0.25
Sat Flow, veh/h	1767	3152	387	1767	2374	1049	1767	2826	657	1767	3064	461
Grp Volume(v), veh/h	118	487	491	108	487	459	97	281	277	247	153	157
Grp Sat Flow(s),veh/h/ln	1767	1763	1777	1767	1763	1660	1767	1763	1720	1767	1763	1762
Q Serve(g_s), s	7.9	32.2	32.2	7.2	32.1	32.1	5.2	18.6	18.9	13.2	8.6	8.8
Cycle Q Clear(g_c), s	7.9	32.2	32.2	7.2	32.1	32.1	5.2	18.6	18.9	13.2	8.6	8.8
Prop In Lane	1.00		0.22	1.00		0.63	1.00		0.38	1.00		0.26
Lane Grp Cap(c), veh/h	143	524	529	132	527	496	456	318	310	574	436	436
V/C Ratio(X)	0.83	0.93	0.93	0.82	0.92	0.92	0.21	0.88	0.89	0.43	0.35	0.36
Avail Cap(c_a), veh/h	177	604	609	177	604	569	456	383	374	574	574	574
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.58	0.58	0.58	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.3	40.9	40.9	54.7	40.8	40.8	35.0	47.9	48.1	31.8	37.2	37.3
Incr Delay (d2), s/veh	11.7	12.2	12.1	14.6	17.7	18.5	0.1	16.4	18.5	0.2	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	15.4	15.6	3.7	16.2	15.4	2.2	9.5	9.6	5.5	3.7	3.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	66.0	53.1	53.0	69.3	58.5	59.3	35.1	64.4	66.6	32.0	37.4	37.5
LnGrp LOS	E	D	D	E	E	E	D	E	E	C	D	D
Approach Vol, veh/h	1096			1054			655			557		
Approach Delay, s/veh	54.4			59.9			61.0			35.0		
Approach LOS	D			E			E			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	2.9	39.6	33.9	33.6	12.7	39.8	42.0	25.5				
Change Period (Y+Rc), s	3.9	* 3.9	3.0	3.9	3.0	3.9	3.0	3.9				
Max Green Setting (Gmax), s	41	* 41	14.0	39.1	12.0	41.1	27.0	26.1				
Max Q Clear Time (g_c+19.2), s	34.2	* 34.2	7.2	10.8	9.9	34.1	15.2	20.9				
Green Ext Time (p_c), s	0.0	1.5	0.0	0.5	0.0	1.5	0.1	0.7				

Intersection Summary

HCM 6th Ctrl Delay 54.2

HCM 6th LOS D

Notes





User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection

Intersection Delay, s/veh 7.9

Intersection LOS A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	10	0	0	10	60	0	0	0	100	0	0
Future Vol, veh/h	0	10	0	0	10	60	0	0	0	100	0	0
Peak Hour Factor	0.66	0.66	0.92	0.92	0.66	0.66	0.92	0.92	0.92	0.66	0.92	0.66
Heavy Vehicles, %	3	3	2	2	3	3	2	2	2	3	2	3
Mvmt Flow	0	15	0	0	15	91	0	0	0	152	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

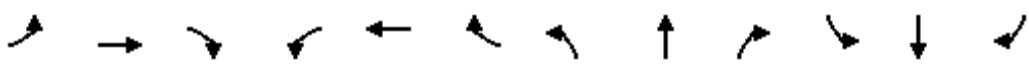
Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.5	7.3	0	8.4
HCM LOS	A	A	-	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	0%	0%	100%
Vol Thru, %	100%	100%	14%	0%
Vol Right, %	0%	0%	86%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	0	10	70	100
LT Vol	0	0	0	100
Through Vol	0	10	10	0
RT Vol	0	0	60	0
Lane Flow Rate	0	15	106	152
Geometry Grp	1	1	1	1
Degree of Util (X)	0	0.019	0.112	0.184
Departure Headway (Hd)	4.262	4.413	3.814	4.36
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	0	815	945	820
Service Time	2.353	2.416	1.815	2.406
HCM Lane V/C Ratio	0	0.018	0.112	0.185
HCM Control Delay	7.4	7.5	7.3	8.4
HCM Lane LOS	N	A	A	A
HCM 95th-tile Q	0	0.1	0.4	0.7

HCM 6th Signalized Intersection Summary







1: Marlow Rd & Marlow Ct/W Steele Ln

Lance Drive Residential TIA
Cumulative AM (120-140 Seconds)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	10	10	10	260	10	210	10	600	260	160	580	10
Future Volume (veh/h)	10	10	10	260	10	210	10	600	260	160	580	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.94	1.00		1.00	1.00		0.96	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	12	12	2	311	0	154	12	698	209	186	674	11
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	31	31	5	1676	0	931	24	820	1096	212	1197	20
Arrive On Green	0.04	0.04	0.04	0.47	0.00	0.47	0.01	0.23	0.23	0.12	0.34	0.34
Sat Flow, veh/h	822	822	137	3534	0	1566	1767	3526	1506	1767	3549	58
Grp Volume(v), veh/h	26	0	0	311	0	154	12	698	209	186	335	350
Grp Sat Flow(s),veh/h/ln	1780	0	0	1767	0	1566	1767	1763	1506	1767	1763	1845
Q Serve(g_s), s	2.0	0.0	0.0	7.1	0.0	0.0	0.9	26.5	6.6	14.5	21.7	21.8
Cycle Q Clear(g_c), s	2.0	0.0	0.0	7.1	0.0	0.0	0.9	26.5	6.6	14.5	21.7	21.8
Prop In Lane	0.46		0.08	1.00		1.00	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	67	0	0	1676	0	931	24	820	1096	212	594	622
V/C Ratio(X)	0.39	0.00	0.00	0.19	0.00	0.17	0.51	0.85	0.19	0.88	0.56	0.56
Avail Cap(c_a), veh/h	243	0	0	1676	0	931	77	992	1170	329	744	779
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.54	0.54	0.54	1.00	1.00	1.00
Uniform Delay (d), s/veh	65.8	0.0	0.0	21.2	0.0	12.8	68.6	51.4	7.0	60.6	38.0	38.0
Incr Delay (d2), s/veh	3.7	0.0	0.0	0.2	0.0	0.4	8.9	3.5	0.0	15.0	0.8	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	0.0	3.1	0.0	2.3	0.5	12.0	6.5	7.4	9.5	9.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	69.5	0.0	0.0	21.5	0.0	13.2	77.5	54.9	7.0	75.6	38.8	38.8
LnGrp LOS	E	A	A	C	A	B	E	D	A	E	D	D
Approach Vol, veh/h		26			465			919			871	
Approach Delay, s/veh		69.5			18.7			44.3			46.6	
Approach LOS		E			B			D			D	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		71.0	6.8	52.1		10.1	21.7	37.2				
Change Period (Y+Rc), s		4.6	4.9	4.9		4.9	4.9	4.6				
Max Green Setting (Gmax), s		36.4	6.1	59.1		19.1	26.1	39.4				
Max Q Clear Time (g_c+I1), s		9.1	2.9	23.8		4.0	16.5	28.5				
Green Ext Time (p_c), s		1.7	0.0	4.5		0.1	0.3	4.0				
Intersection Summary												
HCM 6th Ctrl Delay			40.3									
HCM 6th LOS			D									
Notes												
User approved pedestrian interval to be less than phase max green.												
User approved volume balancing among the lanes for turning movement.												

HCM 6th TWSC
2: Iroquois St/Apple Valley Ln & W Steele Ln

Lance Drive Residential TIA
Cumulative AM (120-140 Seconds)

Intersection												
Int Delay, s/veh	6.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	40	420	60	20	360	20	50	10	30	20	10	50
Future Vol, veh/h	40	420	60	20	360	20	50	10	30	20	10	50
Conflicting Peds, #/hr	12	0	24	24	0	12	4	0	4	4	0	4
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	60	-	-	80	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	48	506	72	24	434	24	60	12	36	24	12	60






















Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	470	0	0	602	0	0	1196	1180	570	1172	1204	462
Stage 1	-	-	-	-	-	-	662	662	-	506	506	-
Stage 2	-	-	-	-	-	-	534	518	-	666	698	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1086	-	-	971	-	-	162	189	519	168	183	598
Stage 1	-	-	-	-	-	-	449	458	-	547	538	-
Stage 2	-	-	-	-	-	-	528	532	-	447	441	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1074	-	-	949	-	-	127	170	505	138	165	589
Mov Cap-2 Maneuver	-	-	-	-	-	-	127	170	-	138	165	-
Stage 1	-	-	-	-	-	-	419	427	-	516	519	-
Stage 2	-	-	-	-	-	-	450	513	-	384	411	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.7			0.4			53.7			25		
HCM LOS							F			D		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	176	1074	-	-	949	-	-	275
HCM Lane V/C Ratio	0.616	0.045	-	-	0.025	-	-	0.35
HCM Control Delay (s)	53.7	8.5	-	-	8.9	-	-	25
HCM Lane LOS	F	A	-	-	A	-	-	D
HCM 95th %tile Q(veh)	3.4	0.1	-	-	0.1	-	-	1.5

HCM 6th Signalized Intersection Summary 3: Range Ave & W Steele Ln

Lance Drive Residential TIA
Cumulative AM (120-140 Seconds)











												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	490	60	60	320	50	50	210	30	40	180	40
Future Volume (veh/h)	50	490	60	60	320	50	50	210	30	40	180	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.95	1.00		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	57	557	66	68	364	55	57	239	20	45	205	29
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	718	1246	148	563	1203	182	73	394	33	58	363	50
Arrive On Green	0.77	0.77	0.77	0.77	0.77	0.77	0.04	0.12	0.12	0.03	0.12	0.12
Sat Flow, veh/h	959	1627	193	795	1571	237	1767	3281	272	1767	3082	428
Grp Volume(v), veh/h	57	0	623	68	0	419	57	127	132	45	116	118
Grp Sat Flow(s),veh/h/ln	959	0	1820	795	0	1808	1767	1763	1790	1767	1763	1747
Q Serve(g_s), s	2.7	0.0	17.1	4.7	0.0	9.9	4.5	9.6	9.8	3.5	8.7	9.0
Cycle Q Clear(g_c), s	12.6	0.0	17.1	21.7	0.0	9.9	4.5	9.6	9.8	3.5	8.7	9.0
Prop In Lane	1.00		0.11	1.00		0.13	1.00		0.15	1.00		0.24
Lane Grp Cap(c), veh/h	718	0	1394	563	0	1385	73	212	215	58	208	206
V/C Ratio(X)	0.08	0.00	0.45	0.12	0.00	0.30	0.78	0.60	0.61	0.78	0.56	0.58
Avail Cap(c_a), veh/h	718	0	1394	563	0	1385	189	404	410	126	341	338
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.76	0.76	0.76	1.00	1.00	1.00
Uniform Delay (d), s/veh	6.9	0.0	5.8	9.7	0.0	5.0	66.5	58.4	58.5	67.2	58.3	58.4
Incr Delay (d2), s/veh	0.2	0.0	1.0	0.4	0.0	0.6	5.1	0.8	0.8	8.1	0.9	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	6.1	0.9	0.0	3.5	2.1	4.3	4.4	1.7	3.9	4.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	7.1	0.0	6.9	10.1	0.0	5.6	71.6	59.2	59.3	75.3	59.2	59.4
LnGrp LOS	A	A	A	B	A	A	E	E	E	E	E	E
Approach Vol, veh/h		680			487			316			279	
Approach Delay, s/veh		6.9			6.2			61.5			61.9	
Approach LOS		A			A			E			E	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		110.8	8.8	20.4		110.8	8.5	20.7				
Change Period (Y+Rc), s		3.6	3.0	3.9		3.6	3.9	*3.9				
Max Green Setting (Gmax), s		87.4	15.0	27.1		87.4	10.0	*32				
Max Q Clear Time (g_c+I1), s		19.1	6.5	11.0		23.7	5.5	11.8				
Green Ext Time (p_c), s		1.5	0.0	0.4		1.1	0.0	0.4				
Intersection Summary												
HCM 6th Ctrl Delay			25.2									
HCM 6th LOS			C									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

HCM 6th Signalized Intersection Summary

4: Marlow Rd & Guerneville Rd

Lance Drive Residential TIA
Cumulative AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	140	530	170	170	320	110	150	560	200	140	590	100
Future Volume (veh/h)	140	530	170	170	320	110	150	560	200	140	590	100
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	152	576	119	185	348	94	163	609	94	152	641	96
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	179	686	472	212	595	159	190	729	507	244	729	109
Arrive On Green	0.10	0.19	0.19	0.12	0.22	0.22	0.11	0.21	0.21	0.14	0.24	0.24
Sat Flow, veh/h	1767	3526	1558	1767	2748	732	1767	3526	1541	1767	3066	458
Grp Volume(v), veh/h	152	576	119	185	221	221	163	609	94	152	368	369
Grp Sat Flow(s),veh/h/ln	1767	1763	1558	1767	1763	1717	1767	1763	1541	1767	1763	1762
Q Serve(g_s), s	11.0	20.4	3.0	13.4	14.6	15.0	11.8	21.5	0.0	10.5	26.2	26.2
Cycle Q Clear(g_c), s	11.0	20.4	3.0	13.4	14.6	15.0	11.8	21.5	0.0	10.5	26.2	26.2
Prop In Lane	1.00		1.00	1.00		0.43	1.00		1.00	1.00		0.26
Lane Grp Cap(c), veh/h	179	686	472	212	382	372	190	729	507	244	419	419
V/C Ratio(X)	0.85	0.84	0.25	0.87	0.58	0.59	0.86	0.84	0.19	0.62	0.88	0.88
Avail Cap(c_a), veh/h	265	849	544	295	454	442	268	974	614	265	484	484
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.99	0.99	0.99	0.47	0.47	0.47	0.89	0.89	0.89
Uniform Delay (d), s/veh	57.5	50.4	7.3	56.2	45.6	45.8	57.1	49.4	31.3	52.8	47.7	47.8
Incr Delay (d2), s/veh	15.5	6.3	0.3	18.1	6.2	6.7	9.2	2.4	0.1	3.5	13.8	14.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.6	9.5	2.0	6.9	7.0	7.0	5.7	9.6	2.1	4.9	13.0	13.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	73.0	56.7	7.6	74.4	51.8	52.5	66.3	51.8	31.4	56.3	61.5	61.9
LnGrp LOS	E	E	A	E	D	D	E	D	C	E	E	E
Approach Vol, veh/h	847		627			866			889			
Approach Delay, s/veh	52.7		58.7			52.3			60.8			
Approach LOS	D		E			D			E			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	31.3	31.0	19.2	36.2	18.4	33.9	23.3	32.2				
Change Period (Y+Rc), s	5.7	* 5.7	5.3	5.3	5.3	5.7	5.3	5.3				
Max Green Setting (Gmax), s	31.3	* 31	19.7	35.7	19.5	33.5	19.5	35.9				
Max Q Clear Time (g_c+I1), s	11.5	22.4	13.8	28.2	13.0	17.0	12.5	23.5				
Green Ext Time (p_c), s	0.2	2.7	0.2	2.6	0.2	2.2	0.2	3.3				

Intersection Summary

HCM 6th Ctrl Delay	56.0
HCM 6th LOS	E

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary

5: Ridley Ave & Guerneville Rd

Lance Drive Residential TIA
Cumulative AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	810	30	70	520	20	50	10	70	40	10	30
Future Volume (veh/h)	30	810	30	70	520	20	50	10	70	40	10	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	0.98		0.97	0.99		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	34	910	33	79	584	21	56	11	31	45	11	9
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	735	2938	107	519	2941	106	122	29	51	139	33	21
Arrive On Green	0.85	0.85	0.85	1.00	1.00	1.00	0.10	0.10	0.10	0.10	0.10	0.10
Sat Flow, veh/h	807	3466	126	589	3471	125	794	279	496	929	323	201
Grp Volume(v), veh/h	34	463	480	79	296	309	98	0	0	65	0	0
Grp Sat Flow(s),veh/h/ln	807	1763	1829	589	1763	1832	1569	0	0	1453	0	0
Q Serve(g_s), s	0.9	7.6	7.6	1.4	0.0	0.0	2.1	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.9	7.6	7.6	9.0	0.0	0.0	7.8	0.0	0.0	5.7	0.0	0.0
Prop In Lane	1.00		0.07	1.00		0.07	0.57		0.32	0.69		0.14
Lane Grp Cap(c), veh/h	735	1494	1550	519	1494	1553	202	0	0	193	0	0
V/C Ratio(X)	0.05	0.31	0.31	0.15	0.20	0.20	0.48	0.00	0.00	0.34	0.00	0.00
Avail Cap(c_a), veh/h	735	1494	1550	519	1494	1553	498	0	0	485	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.87	0.87	0.87	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	1.7	2.2	2.2	0.3	0.0	0.0	59.7	0.0	0.0	58.8	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.5	0.5	0.0	0.0	0.0	0.7	0.0	0.0	0.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln0.1	1.8	1.9	0.0	0.0	0.0	0.0	3.4	0.0	0.0	2.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	1.8	2.7	2.7	0.3	0.0	0.0	60.3	0.0	0.0	59.2	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	E	A	A	E	A	A
Approach Vol, veh/h	977			684			98			65		
Approach Delay, s/veh	2.6			0.1			60.3			59.2		
Approach LOS	A			A			E			E		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	122.6			17.4			122.6			17.4		
Change Period (Y+Rc), s	3.9			3.0			3.9			3.0		
Max Green Setting (Gmax), s	90.1			43.0			90.1			43.0		
Max Q Clear Time (g_c+I1), s	9.6			7.7			11.0			9.8		
Green Ext Time (p_c), s	1.9			0.2			1.5			0.3		

Intersection Summary

HCM 6th Ctrl Delay	6.8
HCM 6th LOS	A

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

6: Lance Dr & Guerneville Rd

Lance Drive Residential TIA

Cumulative AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	850	30	30	520	60	20	60	80	70	100	70
Future Volume (veh/h)	30	850	30	30	520	60	20	60	80	70	100	70
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.99	0.99		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	36	1012	35	36	619	51	24	71	59	83	119	68
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	57	1042	36	67	1076	469	59	162	119	114	140	74
Arrive On Green	0.06	0.60	0.60	0.01	0.10	0.10	0.20	0.20	0.20	0.20	0.20	0.20
Sat Flow, veh/h	1767	3473	120	1767	3526	1537	151	829	609	414	716	380
Grp Volume(v), veh/h	36	514	533	36	619	51	154	0	0	270	0	0
Grp Sat Flow(s), veh/h/ln	1767	1763	1831	1767	1763	1537	1589	0	0	1511	0	0
Q Serve(g_s), s	2.8	39.1	39.1	2.8	23.5	4.2	0.0	0.0	0.0	13.4	0.0	0.0
Cycle Q Clear(g_c), s	2.8	39.1	39.1	2.8	23.5	4.2	11.2	0.0	0.0	24.6	0.0	0.0
Prop In Lane	1.00		0.07	1.00		1.00	0.16		0.38	0.31		0.25
Lane Grp Cap(c), veh/h	57	529	549	67	1076	469	340	0	0	328	0	0
V/C Ratio(X)	0.63	0.97	0.97	0.54	0.58	0.11	0.45	0.00	0.00	0.82	0.00	0.00
Avail Cap(c_a), veh/h	135	852	885	135	1705	743	558	0	0	539	0	0
HCM Platoon Ratio	2.00	2.00	2.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.96	0.96	0.96	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	64.7	27.4	27.4	67.9	54.3	45.6	49.8	0.0	0.0	55.3	0.0	0.0
Incr Delay (d2), s/veh	4.2	14.6	14.2	2.4	2.1	0.4	0.4	0.0	0.0	2.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	13.1	13.5	1.3	11.5	1.7	4.9	0.0	0.0	9.6	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	68.9	42.0	41.7	70.3	56.4	46.1	50.1	0.0	0.0	57.3	0.0	0.0
LnGrp LOS	E	D	D	E	E	D	D	A	A	E	A	A
Approach Vol, veh/h	1083			706			154			270		
Approach Delay, s/veh	42.7			56.4			50.1			57.3		
Approach LOS	D			E			D			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	47.3			31.9	9.8	48.0		31.9				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		4.6				
Max Green Setting (Gmax), s	67.7			46.4	10.7	67.7		46.4				
Max Q Clear Time (g_c+14), s	41.1			26.6	4.8	25.5		13.2				
Green Ext Time (p_c), s	0.0	0.9		0.4	0.0	0.7		0.2				

Intersection Summary

HCM 6th Ctrl Delay 49.4

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

7: N Dutton Ave/Westberry Dr & Guerneville Rd

Lance Drive Residential TIA
Cumulative AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	980	120	290	540	10	100	10	440	30	10	10
Future Volume (veh/h)	10	980	120	290	540	10	100	10	440	30	10	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.99	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	12	1181	139	349	651	11	129	0	219	36	12	1
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	28	1220	143	1279	2630	44	178	0	665	60	20	2
Arrive On Green	0.02	0.38	0.38	0.75	1.00	1.00	0.05	0.00	0.05	0.05	0.05	0.05
Sat Flow, veh/h	1767	3171	372	3428	3546	60	3534	0	1563	1309	436	36
Grp Volume(v), veh/h	12	655	665	349	324	338	129	0	219	49	0	0
Grp Sat Flow(s), veh/h/ln	1767	1763	1781	1714	1763	1843	1767	0	1563	1782	0	0
Q Serve(g_s), s	0.9	50.9	51.4	4.5	0.0	0.0	5.0	0.0	0.0	3.8	0.0	0.0
Cycle Q Clear(g_c), s	0.9	50.9	51.4	4.5	0.0	0.0	5.0	0.0	0.0	3.8	0.0	0.0
Prop In Lane	1.00		0.21	1.00		0.03	1.00		1.00	0.73		0.02
Lane Grp Cap(c), veh/h	28	678	685	1279	1307	1367	178	0	665	81	0	0
V/C Ratio(X)	0.42	0.97	0.97	0.27	0.25	0.25	0.72	0.00	0.33	0.60	0.00	0.00
Avail Cap(c_a), veh/h	77	698	705	1279	1307	1367	220	0	684	353	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.88	0.88	0.88	0.92	0.92	0.92	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	68.2	42.2	42.3	11.7	0.0	0.0	65.5	0.0	27.0	65.6	0.0	0.0
Incr Delay (d2), s/veh	3.3	25.1	25.9	0.0	0.4	0.4	6.1	0.0	0.1	2.7	0.0	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	26.2	26.8	1.6	0.2	0.2	2.4	0.0	4.9	1.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	71.5	67.3	68.2	11.8	0.4	0.4	71.6	0.0	27.1	68.2	0.0	0.0
LnGrp LOS	E	E	E	B	A	A	E	A	C	E	A	A
Approach Vol, veh/h	1332			1011			348			49		
Approach Delay, s/veh	67.8			4.3			43.6			68.2		
Approach LOS	E			A			D			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	57.5	59.2		11.0	7.5	109.1		12.4				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		5.3				
Max Green Setting (Gmax), s	27.3	55.4		27.7	6.1	77.0		8.7				
Max Q Clear Time (g_c+I1), s	53.4	53.4		5.8	2.9	2.0		7.0				
Green Ext Time (p_c), s	0.0	0.5		0.0	0.0	0.5		0.0				

Intersection Summary

HCM 6th Ctrl Delay 41.3

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.








User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

8: Herbert St/Coffey Ln & Guerneville Rd

Lance Drive Residential TIA
Cumulative AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	150	1250	40	30	620	50	30	20	20	90	10	180
Future Volume (veh/h)	150	1250	40	30	620	50	30	20	20	90	10	180
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.96	1.00		0.94	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	174	1453	46	35	721	55	35	23	6	105	12	62
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	194	1468	46	487	1941	148	63	41	11	150	17	316
Arrive On Green	0.22	0.84	0.84	0.28	0.59	0.59	0.07	0.07	0.07	0.09	0.09	0.09
Sat Flow, veh/h	1767	3482	110	1767	3307	252	965	634	165	1594	182	1511
Grp Volume(v), veh/h	174	734	765	35	384	392	64	0	0	117	0	62
Grp Sat Flow(s),veh/h/ln	1767	1763	1830	1767	1763	1796	1765	0	0	1776	0	1511
Q Serve(g_s), s	13.4	54.8	56.1	2.0	16.1	16.1	4.9	0.0	0.0	8.9	0.0	4.8
Cycle Q Clear(g_c), s	13.4	54.8	56.1	2.0	16.1	16.1	4.9	0.0	0.0	8.9	0.0	4.8
Prop In Lane	1.00		0.06	1.00		0.14	0.55		0.09	0.90		1.00
Lane Grp Cap(c), veh/h	194	743	771	487	1035	1054	115	0	0	168	0	316
V/C Ratio(X)	0.90	0.99	0.99	0.07	0.37	0.37	0.56	0.00	0.00	0.70	0.00	0.20
Avail Cap(c_a), veh/h	263	786	815	487	1035	1054	316	0	0	334	0	457
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.61	0.61	0.61	0.92	0.92	0.92	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	53.8	10.7	10.8	37.5	15.3	15.3	63.5	0.0	0.0	61.5	0.0	46.2
Incr Delay (d2), s/veh	14.1	23.1	23.5	0.0	0.9	0.9	1.6	0.0	0.0	2.0	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.0	9.1	9.5	0.9	6.5	6.7	2.3	0.0	0.0	4.1	0.0	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	67.9	33.7	34.2	37.5	16.2	16.2	65.0	0.0	0.0	63.4	0.0	46.3
LnGrp LOS	E	C	C	D	B	B	E	A	A	E	A	D
Approach Vol, veh/h	1673				811		64		179			
Approach Delay, s/veh	37.5				17.1		65.0		57.5			
Approach LOS	D				B		E		E			
Timer - Assigned Phs	1	2	4		5	6	8					
Phs Duration (G+Y+Rc), s	43.8	64.3	18.1		20.7	87.5	13.7					
Change Period (Y+Rc), s	5.3	5.3	4.9		5.3	5.3	4.6					
Max Green Setting (Gmax), s	62.4	62.4	26.3		20.8	47.7	25.1					
Max Q Clear Time (g_c+14), s	58.1	58.1	10.9		15.4	18.1	6.9					
Green Ext Time (p_c), s	0.0	0.9	0.1		0.0	0.6	0.1					
Intersection Summary												
HCM 6th Ctrl Delay			33.4									
HCM 6th LOS			C									

HCM 6th Signalized Intersection Summary

9: Range Ave & Guerneville Rd

Lance Drive Residential TIA
Cumulative AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	170	810	180	90	470	10	160	110	90	40	120	130
Future Volume (veh/h)	170	810	180	90	470	10	160	110	90	40	120	130
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No		No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	181	862	0	96	500	0	102	212	19	43	128	29
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	278	929		119	613		180	340	30	111	179	39
Arrive On Green	0.16	0.26	0.00	0.07	0.17	0.00	0.10	0.10	0.10	0.06	0.06	0.06
Sat Flow, veh/h	1767	3618	0	1767	3618	0	1767	3349	297	1767	2847	622
Grp Volume(v), veh/h	181	862	0	96	500	0	102	116	115	43	77	80
Grp Sat Flow(s), veh/h/ln	1767	1763	0	1767	1763	0	1767	1856	1790	1767	1763	1706
Q Serve(g_s), s	11.5	28.6	0.0	6.4	16.4	0.0	6.6	7.2	7.4	2.8	5.2	5.5
Cycle Q Clear(g_c), s	11.5	28.6	0.0	6.4	16.4	0.0	6.6	7.2	7.4	2.8	5.2	5.5
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.17	1.00		0.36
Lane Grp Cap(c), veh/h	278	929		119	613		180	189	182	111	111	107
V/C Ratio(X)	0.65	0.93		0.81	0.82		0.57	0.62	0.63	0.39	0.70	0.74
Avail Cap(c_a), veh/h	278	1307		158	1072		492	516	498	161	160	155
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.70	0.70	0.00	0.96	0.96	0.00	1.00	1.00	1.00	0.76	0.76	0.76
Uniform Delay (d), s/veh	47.5	43.1	0.0	55.2	47.7	0.0	51.4	51.7	51.7	54.0	55.1	55.3
Incr Delay (d2), s/veh	3.0	5.6	0.0	14.5	11.1	0.0	1.0	1.2	1.3	0.6	2.3	3.7
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	5.2	12.8	0.0	3.3	8.1	0.0	3.0	3.4	3.4	1.2	2.3	2.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	50.5	48.7	0.0	69.7	58.8	0.0	52.4	52.9	53.1	54.6	57.4	59.0
LnGrp LOS	D	D		E	E		D	D	D	D	E	E
Approach Vol, veh/h	1043		A	596		A	333		200			
Approach Delay, s/veh	49.0			60.5			52.8		57.4			
Approach LOS	D			E			D		E			
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	3.4	36.9		12.8	24.2	26.1		16.8				
Change Period (Y+Rc), s	5.3	5.3		5.3	5.3	5.3		4.6				
Max Green Setting (Gmax), s	44.5	44.5		10.9	18.7	36.5		33.4				
Max Q Clear Time (g_c+1/3), s	30.6	30.6		7.5	13.5	18.4		9.4				
Green Ext Time (p_c), s	0.0	1.0		0.0	0.0	0.6		0.2				

Intersection Summary

HCM 6th Ctrl Delay	53.5
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

10: Guerneville Rd & Steele Wy

Lance Drive Residential TIA
Cumulative AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	860	50	70	520	10	30	20	70	460	20	20
Future Volume (veh/h)	30	860	50	70	520	10	30	20	70	460	20	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	34	977	37	80	591	10	28	31	18	539	0	15
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	814	2090	1015	171	647	11	94	99	161	587	0	984
Arrive On Green	0.46	0.59	0.59	0.05	0.18	0.18	0.05	0.05	0.05	0.17	0.00	0.17
Sat Flow, veh/h	1767	3526	1571	3428	3546	60	1767	1856	1555	3534	0	1567
Grp Volume(v), veh/h	34	977	37	80	294	307	28	31	18	539	0	15
Grp Sat Flow(s), veh/h/ln	1767	1763	1571	1714	1763	1843	1767	1856	1555	1767	0	1567
Q Serve(g_s), s	1.5	21.8	1.2	3.2	22.9	22.9	2.1	2.3	1.5	21.0	0.0	0.0
Cycle Q Clear(g_c), s	1.5	21.8	1.2	3.2	22.9	22.9	2.1	2.3	1.5	21.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.03	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	814	2090	1015	171	322	336	94	99	161	587	0	984
V/C Ratio(X)	0.04	0.47	0.04	0.47	0.91	0.91	0.30	0.31	0.11	0.92	0.00	0.02
Avail Cap(c_a), veh/h	814	2090	1015	198	631	659	346	363	383	886	0	1117
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.84	0.84	0.84	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	20.8	16.0	9.0	64.7	56.1	56.1	63.8	63.8	57.0	57.4	0.0	9.9
Incr Delay (d2), s/veh	0.0	0.6	0.1	0.7	4.2	4.1	0.6	0.7	0.1	7.9	0.0	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	8.8	0.5	1.4	10.5	11.0	1.0	1.1	0.6	10.0	0.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	20.8	16.7	9.0	65.4	60.4	60.2	64.4	64.5	57.1	65.4	0.0	9.9
LnGrp LOS	C	B	A	E	E	E	E	E	E	E	A	A
Approach Vol, veh/h	1048			681			77			554		
Approach Delay, s/veh	16.5			60.9			62.7			63.8		
Approach LOS	B			E			E			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	1.9	87.9		28.2	69.4	30.5		12.0				
Change Period (Y+Rc), s	4.9	4.9		4.9	4.9	4.9		4.6				
Max Green Setting (Gmax), s	50.1			35.1	8.1	50.1		27.4				
Max Q Clear Time (g_c+15), s	23.8			23.0	3.5	24.9		4.3				
Green Ext Time (p_c), s	0.0	1.3		0.1	0.0	0.5		0.0				

Intersection Summary

HCM 6th Ctrl Delay 42.0

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

11: Cleveland Ave & Guerneville Rd

Lance Drive Residential TIA
Cumulative AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↑↑↓		↰↱	↑↑	↱	↰	↑↓		↰	↑↓	
Traffic Volume (veh/h)	70	1320	40	210	960	230	40	110	170	270	80	50
Future Volume (veh/h)	70	1320	40	210	960	230	40	110	170	270	80	50
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	77	1451	41	231	1055	153	44	121	80	297	88	39
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	241	1548	44	277	1115	486	646	762	467	381	131	58
Arrive On Green	0.07	0.31	0.31	0.08	0.32	0.32	0.37	0.37	0.37	0.11	0.11	0.11
Sat Flow, veh/h	3428	5060	143	3428	3526	1538	1767	2085	1277	3534	1211	537
Grp Volume(v), veh/h	77	968	524	231	1055	153	44	101	100	297	0	127
Grp Sat Flow(s), veh/h/ln	1714	1689	1826	1714	1763	1538	1767	1763	1599	1767	0	1748
Q Serve(g_s), s	3.0	39.1	39.1	9.3	40.9	10.6	2.3	5.4	5.9	11.5	0.0	9.8
Cycle Q Clear(g_c), s	3.0	39.1	39.1	9.3	40.9	10.6	2.3	5.4	5.9	11.5	0.0	9.8
Prop In Lane	1.00		0.08	1.00		1.00	1.00		0.80	1.00		0.31
Lane Grp Cap(c), veh/h	241	1033	559	277	1115	486	646	644	584	381	0	189
V/C Ratio(X)	0.32	0.94	0.94	0.83	0.95	0.31	0.07	0.16	0.17	0.78	0.00	0.67
Avail Cap(c_a), veh/h	241	1257	680	394	1488	649	646	644	584	1088	0	538
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.68	0.68	0.68	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	61.9	47.3	47.3	63.4	46.7	36.3	28.9	29.9	30.1	60.8	0.0	60.1
Incr Delay (d2), s/veh	0.3	10.9	17.3	4.9	6.9	0.1	0.2	0.5	0.6	1.3	0.0	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	17.8	20.2	4.2	18.8	4.0	1.0	2.4	2.4	5.2	0.0	4.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	62.2	58.1	64.5	68.4	53.6	36.4	29.1	30.4	30.7	62.1	0.0	61.6
LnGrp LOS	E	E	E	E	D	D	C	C	C	E	A	E
Approach Vol, veh/h	1569			1439			245			424		
Approach Delay, s/veh	60.5			54.2			30.3			62.0		
Approach LOS	E			D			C			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.2	47.7		56.1	14.8	49.2		20.0				
Change Period (Y+Rc), s	4.9	4.9		4.9	4.9	4.9		4.9				
Max Green Setting (Gmax), s	6.5	52.1		9.1	9.1	59.1		43.1				
Max Q Clear Time (g_c+I1), s	11.3	41.1		7.9	5.0	42.9		13.5				
Green Ext Time (p_c), s	0.0	1.8		0.0	0.0	1.4		0.1				

Intersection Summary

HCM 6th Ctrl Delay	56.2
HCM 6th LOS	E

Notes

User approved pedestrian interval to be less than phase max green.
User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 12: US 101 SB Ramps & Guerneville Rd

Lance Drive Residential TIA
Cumulative AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑					↑	↑	↑
Traffic Volume (veh/h)	0	1180	580	310	1070	0	0	0	0	420	10	320
Future Volume (veh/h)	0	1180	580	310	1070	0	0	0	0	420	10	320
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1856	1856	1856	1856	0				1856	1856	1856
Adj Flow Rate, veh/h	0	1326	242	348	1202	0				480	0	303
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89				0.89	0.89	0.89
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	1432	437	393	1524	0				1767	0	786
Arrive On Green	0.00	0.28	0.28	0.11	0.43	0.00				0.50	0.00	0.50
Sat Flow, veh/h	0	5233	1545	3428	3618	0				3534	0	1572
Grp Volume(v), veh/h	0	1326	242	348	1202	0				480	0	303
Grp Sat Flow(s),veh/h/ln	0	1689	1545	1714	1763	0				1767	0	1572
Q Serve(g_s), s	0.0	35.6	18.7	14.0	41.1	0.0				11.0	0.0	16.7
Cycle Q Clear(g_c), s	0.0	35.6	18.7	14.0	41.1	0.0				11.0	0.0	16.7
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1432	437	393	1524	0				1767	0	786
V/C Ratio(X)	0.00	0.93	0.55	0.89	0.79	0.00				0.27	0.00	0.39
Avail Cap(c_a), veh/h	0	2066	630	566	2143	0				1767	0	786
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.32	0.32	0.74	0.74	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	48.8	42.7	61.1	34.2	0.0				20.3	0.0	21.7
Incr Delay (d2), s/veh	0.0	1.6	0.1	6.8	0.6	0.0				0.4	0.0	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	15.1	7.1	6.4	17.4	0.0				4.5	0.0	6.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	50.4	42.8	67.8	34.9	0.0				20.6	0.0	23.1
LnGrp LOS	A	D	D	E	C	A				C	A	C
Approach Vol, veh/h		1568			1550						783	
Approach Delay, s/veh		49.3			42.3						21.6	
Approach LOS		D			D						C	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	30.9	44.5		74.6		65.4						
Change Period (Y+Rc), s	4.9	4.9		4.6		4.9						
Max Green Setting (Gmax), s	28.5	57.1		45.4		85.1						
Max Q Clear Time (g_c+I10), s	11.0	37.6		18.7		43.1						
Green Ext Time (p_c), s	0.0	2.0		0.1		1.8						

Intersection Summary

HCM 6th Ctrl Delay 40.9
HCM 6th LOS D

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 13: US 101 NB Ramps & Guerneville Rd/Steele Ln

Lance Drive Residential TIA
Cumulative AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↑↑			↑↑↑		↰	↰↱	↱			
Traffic Volume (veh/h)	420	1180	0	0	950	250	430	10	500	0	0	0
Future Volume (veh/h)	420	1180	0	0	950	250	430	10	500	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1856	1856	0	0	1856	1856	1856	1856	1856			
Adj Flow Rate, veh/h	472	1326	0	0	1067	252	622	0	291			
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89			
Percent Heavy Veh, %	3	3	0	0	3	3	3	3	3			
Cap, veh/h	1434	2591	0	0	1147	271	697	0	310			
Arrive On Green	0.84	1.00	0.00	0.00	0.28	0.28	0.20	0.00	0.20			
Sat Flow, veh/h	3428	3618	0	0	4238	961	3534	0	1572			
Grp Volume(v), veh/h	472	1326	0	0	885	434	622	0	291			
Grp Sat Flow(s),veh/h/ln	1714	1763	0	0	1689	1655	1767	0	1572			
Q Serve(g_s), s	4.3	0.0	0.0	0.0	35.7	35.8	24.0	0.0	25.5			
Cycle Q Clear(g_c), s	4.3	0.0	0.0	0.0	35.7	35.8	24.0	0.0	25.5			
Prop In Lane	1.00		0.00	0.00		0.58	1.00		1.00			
Lane Grp Cap(c), veh/h	1434	2591	0	0	951	466	697	0	310			
V/C Ratio(X)	0.33	0.51	0.00	0.00	0.93	0.93	0.89	0.00	0.94			
Avail Cap(c_a), veh/h	1434	2591	0	0	1209	592	1171	0	521			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.54	0.54	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	7.0	0.0	0.0	0.0	49.0	49.0	54.7	0.0	55.3			
Incr Delay (d2), s/veh	0.0	0.4	0.0	0.0	9.8	17.1	2.8	0.0	11.6			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	1.4	0.1	0.0	0.0	16.2	16.8	10.7	0.0	10.9			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	7.0	0.4	0.0	0.0	58.7	66.1	57.5	0.0	67.0			
LnGrp LOS	A	A	A	A	E	E	E	A	E			
Approach Vol, veh/h	1798			1319			913					
Approach Delay, s/veh	2.1			61.2			60.5					
Approach LOS	A			E			E					
Timer - Assigned Phs	2			5			6			8		
Phs Duration (G+Y+Rc), s	107.8			63.5			44.3			32.2		
Change Period (Y+Rc), s	4.9			4.9			4.9			4.6		
Max Green Setting (Gmax), s	84.1			29.1			50.1			46.4		
Max Q Clear Time (g_c+I1), s	2.0			6.3			37.8			27.5		
Green Ext Time (p_c), s	2.0			0.1			1.7			0.1		

Intersection Summary

HCM 6th Ctrl Delay	34.7
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 14: Stony Point Rd/Marlow Rd & W College Ave

Lance Drive Residential TIA
Cumulative AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	90	410	170	180	220	150	90	690	190	200	660	70
Future Volume (veh/h)	90	410	170	180	220	150	90	690	190	200	660	70
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	100	456	151	200	244	73	100	767	128	222	733	69
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	381	526	173	466	674	197	122	854	788	247	1016	96
Arrive On Green	0.22	0.20	0.20	0.26	0.25	0.25	0.07	0.24	0.24	0.14	0.31	0.31
Sat Flow, veh/h	1767	2594	851	1767	2687	785	1767	3526	1539	1767	3250	306
Grp Volume(v), veh/h	100	309	298	200	158	159	100	767	128	222	397	405
Grp Sat Flow(s),veh/h/ln	1767	1763	1683	1767	1763	1710	1767	1763	1539	1767	1763	1793
Q Serve(g_s), s	6.6	23.7	24.1	13.2	10.3	10.8	7.8	29.5	3.1	17.3	28.0	28.0
Cycle Q Clear(g_c), s	6.6	23.7	24.1	13.2	10.3	10.8	7.8	29.5	3.1	17.3	28.0	28.0
Prop In Lane	1.00		0.51	1.00		0.46	1.00		1.00	1.00		0.17
Lane Grp Cap(c), veh/h	381	357	341	466	442	429	122	854	788	247	551	561
V/C Ratio(X)	0.26	0.86	0.88	0.43	0.36	0.37	0.82	0.90	0.16	0.90	0.72	0.72
Avail Cap(c_a), veh/h	381	437	417	466	477	463	196	924	818	312	578	588
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.43	0.43	0.43	1.00	1.00	1.00	0.60	0.60	0.60
Uniform Delay (d), s/veh	45.6	53.9	54.1	42.8	43.2	43.3	64.3	51.4	6.8	59.2	42.7	42.7
Incr Delay (d2), s/veh	0.4	14.0	16.0	0.3	0.2	0.2	13.2	11.0	0.1	15.8	2.5	2.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	11.7	11.6	5.7	4.5	4.5	3.9	14.1	1.2	8.7	12.4	12.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.0	67.9	70.1	43.0	43.4	43.6	77.4	62.4	6.9	75.0	45.2	45.2
LnGrp LOS	D	E	E	D	D	D	E	E	A	E	D	D
Approach Vol, veh/h	707				517				995			
Approach Delay, s/veh	65.7				43.3				56.8			
Approach LOS	E				D				E			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	42.2	33.7	15.0	49.1	35.5	40.4	24.9	39.2				
Change Period (Y+Rc), s	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3				
Max Green Setting (Gmax), s	42.2	34.7	15.5	45.9	19.5	37.9	24.7	36.7				
Max Q Clear Time (g_c+11.5), s	42.2	26.1	9.8	30.0	8.6	12.8	19.3	31.5				
Green Ext Time (p_c), s	0.3	2.3	0.1	4.3	0.1	1.7	0.3	2.4				

Intersection Summary

HCM 6th Ctrl Delay	55.0
HCM 6th LOS	D









Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary 15: N Dutton Ave & W College Ave

Lance Drive Residential TIA
Cumulative AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	110	810	110	100	610	330	90	420	120	230	250	60
Future Volume (veh/h)	110	810	110	100	610	330	90	420	120	230	250	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	118	871	107	108	656	290	97	452	106	247	269	41
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	140	932	114	131	705	312	519	508	118	610	709	107
Arrive On Green	0.08	0.30	0.30	0.07	0.30	0.30	0.29	0.18	0.18	0.35	0.23	0.23
Sat Flow, veh/h	1767	3152	387	1767	2374	1049	1767	2826	657	1767	3064	461
Grp Volume(v), veh/h	118	487	491	108	487	459	97	281	277	247	153	157
Grp Sat Flow(s),veh/h/ln	1767	1763	1777	1767	1763	1660	1767	1763	1720	1767	1763	1762
Q Serve(g_s), s	9.2	37.7	37.7	8.4	37.6	37.6	5.7	21.7	22.1	14.9	10.2	10.5
Cycle Q Clear(g_c), s	9.2	37.7	37.7	8.4	37.6	37.6	5.7	21.7	22.1	14.9	10.2	10.5
Prop In Lane	1.00		0.22	1.00		0.63	1.00		0.38	1.00		0.26
Lane Grp Cap(c), veh/h	140	521	525	131	524	493	519	317	309	610	408	408
V/C Ratio(X)	0.84	0.93	0.93	0.82	0.93	0.93	0.19	0.89	0.90	0.40	0.38	0.38
Avail Cap(c_a), veh/h	189	618	623	252	681	642	519	530	517	610	568	568
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.61	0.61	0.61	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	63.6	48.0	48.0	63.9	47.8	47.8	37.0	56.0	56.2	34.9	45.3	45.4
Incr Delay (d2), s/veh	11.0	12.8	12.7	4.8	14.9	15.5	0.1	5.3	6.5	0.2	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.6	18.2	18.3	4.0	18.5	17.5	2.5	10.1	10.1	6.4	4.5	4.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	74.5	60.8	60.7	68.6	62.7	63.4	37.0	61.3	62.7	35.0	45.5	45.6
LnGrp LOS	E	E	E	E	E	E	D	E	E	D	D	D
Approach Vol, veh/h	1096			1054			655			557		
Approach Delay, s/veh	62.2			63.6			58.3			40.9		
Approach LOS	E			E			E			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	45.3	45.3	44.1	36.3	14.1	45.5	51.3	29.1				
Change Period (Y+Rc), s	3.9	* 3.9	3.0	3.9	3.0	3.9	3.0	3.9				
Max Green Setting (Gmax), s	49.0	* 49	12.0	45.1	15.0	54.1	15.0	42.1				
Max Q Clear Time (g_c+10), s	39.7	39.7	7.7	12.5	11.2	39.6	16.9	24.1				
Green Ext Time (p_c), s	0.0	1.7	0.0	0.5	0.0	2.0	0.0	1.1				

Intersection Summary

HCM 6th Ctrl Delay 58.4
HCM 6th LOS E

Notes





User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection

Intersection Delay, s/veh 7.9

Intersection LOS A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	10	0	0	10	60	0	0	0	100	0	0
Future Vol, veh/h	0	10	0	0	10	60	0	0	0	100	0	0
Peak Hour Factor	0.66	0.66	0.92	0.92	0.66	0.66	0.92	0.92	0.92	0.66	0.92	0.66
Heavy Vehicles, %	3	3	2	2	3	3	2	2	2	3	2	3
Mvmt Flow	0	15	0	0	15	91	0	0	0	152	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0























Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.5	7.3	0	8.4
HCM LOS	A	A	-	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	0%	0%	100%
Vol Thru, %	100%	100%	14%	0%
Vol Right, %	0%	0%	86%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	0	10	70	100
LT Vol	0	0	0	100
Through Vol	0	10	10	0
RT Vol	0	0	60	0
Lane Flow Rate	0	15	106	152
Geometry Grp	1	1	1	1
Degree of Util (X)	0	0.019	0.112	0.184
Departure Headway (Hd)	4.262	4.413	3.814	4.36
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	0	815	945	820
Service Time	2.353	2.416	1.815	2.406
HCM Lane V/C Ratio	0	0.018	0.112	0.185
HCM Control Delay	7.4	7.5	7.3	8.4
HCM Lane LOS	N	A	A	A
HCM 95th-tile Q	0	0.1	0.4	0.7

HCM 6th Signalized Intersection Summary







1: Marlow Rd & Marlow Ct/W Steele Ln

Lance Drive Residential TIA
Cumulative PM (95-120 Seconds)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	0	10	200	10	170	10	750	200	130	850	10
Future Volume (veh/h)	10	0	10	200	10	170	10	750	200	130	850	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	11	0	0	219	0	110	11	789	150	137	895	11
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	60	0	0	1729	0	854	23	876	1147	98	1038	13
Arrive On Green	0.03	0.00	0.00	0.49	0.00	0.49	0.01	0.25	0.25	0.06	0.29	0.29
Sat Flow, veh/h	1767	0	0	3534	0	1568	1767	3526	1519	1767	3566	44
Grp Volume(v), veh/h	11	0	0	219	0	110	11	789	150	137	442	464
Grp Sat Flow(s),veh/h/ln	1767	0	0	1767	0	1568	1767	1763	1519	1767	1763	1847
Q Serve(g_s), s	0.7	0.0	0.0	3.7	0.0	0.0	0.7	23.8	3.2	6.1	26.1	26.1
Cycle Q Clear(g_c), s	0.7	0.0	0.0	3.7	0.0	0.0	0.7	23.8	3.2	6.1	26.1	26.1
Prop In Lane	1.00		0.00	1.00		1.00	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	60	0	0	1729	0	854	23	876	1147	98	513	537
V/C Ratio(X)	0.18	0.00	0.00	0.13	0.00	0.13	0.48	0.90	0.13	1.40	0.86	0.86
Avail Cap(c_a), veh/h	408	0	0	1729	0	854	154	917	1164	98	513	537
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.58	0.58	0.58	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.6	0.0	0.0	15.3	0.0	12.3	53.9	40.0	4.2	52.0	36.9	36.9
Incr Delay (d2), s/veh	1.4	0.0	0.0	0.2	0.0	0.3	8.7	7.3	0.0	229.5	14.1	13.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.0	1.5	0.0	1.3	0.4	11.0	3.3	8.9	13.0	13.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	53.1	0.0	0.0	15.5	0.0	12.6	62.7	47.3	4.2	281.4	51.0	50.4
LnGrp LOS	D	A	A	B	A	B	E	D	A	F	D	D
Approach Vol, veh/h		11			329			950			1043	
Approach Delay, s/veh		53.1			14.5			40.6			81.0	
Approach LOS		D			B			D			F	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		58.4	6.3	36.9		8.4	11.0	32.2				
Change Period (Y+Rc), s		4.6	4.9	4.9		4.6	4.9	4.9				
Max Green Setting (Gmax), s		30.9	9.6	25.1		25.4	6.1	28.6				
Max Q Clear Time (g_c+I1), s		5.7	2.7	28.1		2.7	8.1	25.8				
Green Ext Time (p_c), s		1.1	0.0	0.0		0.0	0.0	1.5				
Intersection Summary												
HCM 6th Ctrl Delay				55.1								
HCM 6th LOS				E								
Notes												
User approved pedestrian interval to be less than phase max green.												
User approved volume balancing among the lanes for turning movement.												

HCM 6th TWSC
2: Iroquois St/Apple Valley Ln & W Steele Ln

Lance Drive Residential TIA
Cumulative PM (95-120 Seconds)

Intersection												
Int Delay, s/veh	6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	30	340	50	50	530	50	50	10	30	30	20	30
Future Vol, veh/h	30	340	50	50	530	50	50	10	30	30	20	30
Conflicting Peds, #/hr	9	0	9	9	0	9	1	0	2	2	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	60	-	-	80	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	32	358	53	53	558	53	53	11	32	32	21	32






















Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	620	0	0	420	0	0	1176	1184	396	1172	1184	595
Stage 1	-	-	-	-	-	-	458	458	-	700	700	-
Stage 2	-	-	-	-	-	-	718	726	-	472	484	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	956	-	-	1134	-	-	167	188	651	168	188	502
Stage 1	-	-	-	-	-	-	581	565	-	428	440	-
Stage 2	-	-	-	-	-	-	419	428	-	571	550	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	948	-	-	1124	-	-	132	170	644	142	170	497
Mov Cap-2 Maneuver	-	-	-	-	-	-	132	170	-	142	170	-
Stage 1	-	-	-	-	-	-	557	541	-	410	415	-
Stage 2	-	-	-	-	-	-	355	404	-	513	526	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.6			0.7			42.9			34.1		
HCM LOS							E			D		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	186	948	-	-	1124	-	-	206
HCM Lane V/C Ratio	0.509	0.033	-	-	0.047	-	-	0.409
HCM Control Delay (s)	42.9	8.9	-	-	8.4	-	-	34.1
HCM Lane LOS	E	A	-	-	A	-	-	D
HCM 95th %tile Q(veh)	2.5	0.1	-	-	0.1	-	-	1.9

HCM 6th Signalized Intersection Summary 3: Range Ave & W Steele Ln

Lance Drive Residential TIA
Cumulative PM (95-120 Seconds)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	370	80	70	500	60	100	240	50	70	510	60
Future Volume (veh/h)	50	370	80	70	500	60	100	240	50	70	510	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.97	1.00		0.93
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	52	385	78	73	521	60	104	250	34	73	531	51
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	444	929	188	528	1016	117	131	482	65	181	623	60
Arrive On Green	0.62	0.62	0.62	0.62	0.62	0.62	0.07	0.16	0.16	0.10	0.19	0.19
Sat Flow, veh/h	826	1492	302	921	1633	188	1767	3109	417	1767	3227	309
Grp Volume(v), veh/h	52	0	463	73	0	581	104	140	144	73	289	293
Grp Sat Flow(s),veh/h/ln	826	0	1794	921	0	1821	1767	1763	1763	1767	1763	1773
Q Serve(g_s), s	3.5	0.0	12.5	4.2	0.0	16.8	5.5	6.9	7.1	3.7	15.0	15.2
Cycle Q Clear(g_c), s	20.3	0.0	12.5	16.6	0.0	16.8	5.5	6.9	7.1	3.7	15.0	15.2
Prop In Lane	1.00		0.17	1.00		0.10	1.00		0.24	1.00		0.17
Lane Grp Cap(c), veh/h	444	0	1117	528	0	1133	131	273	273	181	340	342
V/C Ratio(X)	0.12	0.00	0.41	0.14	0.00	0.51	0.80	0.51	0.53	0.40	0.85	0.86
Avail Cap(c_a), veh/h	444	0	1117	528	0	1133	223	466	466	205	447	450
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.37	0.37	0.37	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.6	0.0	9.1	13.4	0.0	9.9	43.3	36.8	36.9	39.9	37.0	37.1
Incr Delay (d2), s/veh	0.5	0.0	1.1	0.5	0.0	1.7	1.6	0.2	0.2	0.5	9.2	9.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	4.6	0.9	0.0	6.4	2.4	2.9	3.0	1.6	7.1	7.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.1	0.0	10.3	13.9	0.0	11.6	44.8	37.1	37.1	40.4	46.2	46.8
LnGrp LOS	B	A	B	B	A	B	D	D	D	D	D	D
Approach Vol, veh/h		515			654			388			655	
Approach Delay, s/veh		10.9			11.9			39.2			45.8	
Approach LOS		B			B			D			D	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		62.7	10.0	22.2		62.7	13.6	18.6				
Change Period (Y+Rc), s		3.6	3.0	3.9		3.6	3.9	* 3.9				
Max Green Setting (Gmax), s		48.4	12.0	24.1		48.4	11.0	* 25				
Max Q Clear Time (g_c+I1), s		22.3	7.5	17.2		18.8	5.7	9.1				
Green Ext Time (p_c), s		1.1	0.0	0.7		1.4	0.0	0.4				
Intersection Summary												
HCM 6th Ctrl Delay			26.5									
HCM 6th LOS			C									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

HCM 6th Signalized Intersection Summary

4: Marlow Rd & Guerneville Rd

Lance Drive Residential TIA
Cumulative PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	200	480	150	310	540	140	160	720	190	80	840	90
Future Volume (veh/h)	200	480	150	310	540	140	160	720	190	80	840	90
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	211	505	78	326	568	128	168	758	112	84	884	88
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	218	668	435	286	661	148	162	906	650	233	961	96
Arrive On Green	0.12	0.19	0.19	0.16	0.23	0.23	0.09	0.26	0.26	0.13	0.30	0.30
Sat Flow, veh/h	1767	3526	1537	1767	2847	639	1767	3526	1539	1767	3232	322
Grp Volume(v), veh/h	211	505	78	326	351	345	168	758	112	84	482	490
Grp Sat Flow(s),veh/h/ln	1767	1763	1537	1767	1763	1723	1767	1763	1539	1767	1763	1791
Q Serve(g_s), s	11.3	12.9	1.8	15.4	18.1	18.3	8.7	19.3	0.0	4.1	25.1	25.1
Cycle Q Clear(g_c), s	11.3	12.9	1.8	15.4	18.1	18.3	8.7	19.3	0.0	4.1	25.1	25.1
Prop In Lane	1.00		1.00	1.00		0.37	1.00		1.00	1.00		0.18
Lane Grp Cap(c), veh/h	218	668	435	286	409	400	162	906	650	233	524	533
V/C Ratio(X)	0.97	0.76	0.18	1.14	0.86	0.86	1.04	0.84	0.17	0.36	0.92	0.92
Avail Cap(c_a), veh/h	218	865	521	286	447	437	162	1054	715	233	536	545
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.95	0.95	0.95	0.48	0.48	0.48	0.63	0.63	0.63
Uniform Delay (d), s/veh	41.5	36.4	8.7	39.8	35.0	35.0	43.2	33.4	17.3	37.6	32.3	32.3
Incr Delay (d2), s/veh	52.1	2.8	0.2	95.1	19.3	20.2	59.2	2.6	0.1	0.6	14.8	14.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.9	5.6	0.8	14.0	9.6	9.5	6.3	8.2	1.5	1.8	12.4	12.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	93.6	39.3	8.9	134.9	54.2	55.2	102.4	36.0	17.3	38.2	47.0	46.9
LnGrp LOS	F	D	A	F	D	E	F	D	B	D	D	D
Approach Vol, veh/h	794			1022			1038			1056		
Approach Delay, s/veh	50.7			80.3			44.8			46.3		
Approach LOS	D			F			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	21.1	23.7	14.0	33.6	17.0	27.8	17.8	29.7				
Change Period (Y+Rc), s	5.7	* 5.7	5.3	5.3	5.3	5.7	5.3	5.3				
Max Green Setting (Gmax), s	22.5	* 23	8.7	28.9	11.7	24.1	9.2	28.4				
Max Q Clear Time (g_c+I1), s	17.4	14.9	10.7	27.1	13.3	20.3	6.1	21.3				
Green Ext Time (p_c), s	0.0	2.2	0.0	1.0	0.0	1.5	0.0	3.0				

Intersection Summary

HCM 6th Ctrl Delay 55.7

HCM 6th LOS E

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary 5: Ridley Ave & Guerneville Rd

Lance Drive Residential TIA
Cumulative PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	740	40	80	940	20	20	10	50	20	10	20
Future Volume (veh/h)	20	740	40	80	940	20	20	10	50	20	10	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	22	796	42	86	1011	22	22	11	3	22	11	0
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	546	2956	156	614	3060	67	107	42	8	115	44	0
Arrive On Green	0.87	0.87	0.87	1.00	1.00	1.00	0.06	0.06	0.06	0.06	0.06	0.00
Sat Flow, veh/h	541	3406	180	650	3526	77	770	700	134	866	747	0
Grp Volume(v), veh/h	22	412	426	86	505	528	36	0	0	33	0	0
Grp Sat Flow(s),veh/h/ln	541	1763	1823	650	1763	1840	1603	0	0	1613	0	0
Q Serve(g_s), s	0.5	3.8	3.8	0.7	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.5	3.8	3.8	4.5	0.0	0.0	1.8	0.0	0.0	1.6	0.0	0.0
Prop In Lane	1.00		0.10	1.00		0.04	0.61		0.08	0.67		0.00
Lane Grp Cap(c), veh/h	546	1530	1582	614	1530	1597	156	0	0	159	0	0
V/C Ratio(X)	0.04	0.27	0.27	0.14	0.33	0.33	0.23	0.00	0.00	0.21	0.00	0.00
Avail Cap(c_a), veh/h	546	1530	1582	614	1530	1597	529	0	0	531	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.83	0.83	0.83	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.9	1.1	1.1	0.1	0.0	0.0	42.9	0.0	0.0	42.8	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.4	0.3	0.0	0.0	0.0	0.3	0.0	0.0	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.2	0.2	0.0	0.0	0.0	0.8	0.0	0.0	0.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	1.0	1.4	1.4	0.1	0.0	0.0	43.2	0.0	0.0	43.0	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	D	A	A	D	A	A
Approach Vol, veh/h	860			1119			36			33		
Approach Delay, s/veh	1.4			0.1			43.2			43.0		
Approach LOS	A			A			D			D		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	86.4			8.6			86.4			8.6		
Change Period (Y+Rc), s	3.9			3.0			3.9			3.0		
Max Green Setting (Gmax), s	59.1			29.0			59.1			29.0		
Max Q Clear Time (g_c+I1), s	5.8			3.6			6.5			3.8		
Green Ext Time (p_c), s	1.7			0.1			2.4			0.1		

Intersection Summary

HCM 6th Ctrl Delay	2.1
HCM 6th LOS	A

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

6: Lance Dr & Guerneville Rd

Lance Drive Residential TIA
Cumulative PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	680	20	70	1020	120	10	30	50	60	40	40
Future Volume (veh/h)	60	680	20	70	1020	120	10	30	50	60	40	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	0.99		0.99	0.99		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	62	708	20	73	1062	108	10	31	15	62	42	30
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	90	765	22	272	1133	494	63	137	57	131	74	43
Arrive On Green	0.10	0.44	0.44	0.20	0.43	0.43	0.12	0.12	0.12	0.12	0.12	0.12
Sat Flow, veh/h	1767	3499	99	1767	3526	1536	147	1123	464	619	609	354
Grp Volume(v), veh/h	62	357	371	73	1062	108	56	0	0	134	0	0
Grp Sat Flow(s), veh/h/ln	1767	1763	1835	1767	1763	1536	1734	0	0	1583	0	0
Q Serve(g_s), s	3.2	18.2	18.2	3.3	27.3	4.2	0.0	0.0	0.0	4.8	0.0	0.0
Cycle Q Clear(g_c), s	3.2	18.2	18.2	3.3	27.3	4.2	2.7	0.0	0.0	7.5	0.0	0.0
Prop In Lane	1.00		0.05	1.00		1.00	0.18		0.27	0.46		0.22
Lane Grp Cap(c), veh/h	90	385	401	272	1133	494	256	0	0	249	0	0
V/C Ratio(X)	0.69	0.93	0.93	0.27	0.94	0.22	0.22	0.00	0.00	0.54	0.00	0.00
Avail Cap(c_a), veh/h	162	737	767	272	1473	642	600	0	0	565	0	0
HCM Platoon Ratio	2.00	2.00	2.00	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.86	0.86	0.86	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	41.9	26.0	26.0	33.3	26.3	19.7	37.8	0.0	0.0	39.8	0.0	0.0
Incr Delay (d2), s/veh	3.5	4.1	4.0	0.2	13.7	0.9	0.2	0.0	0.0	0.7	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	5.6	5.9	1.4	11.6	1.5	1.2	0.0	0.0	3.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.4	30.2	30.1	33.5	40.0	20.5	38.0	0.0	0.0	40.5	0.0	0.0
LnGrp LOS	D	C	C	C	D	C	D	A	A	D	A	A
Approach Vol, veh/h	790			1243			56			134		
Approach Delay, s/veh	31.3			37.9			38.0			40.5		
Approach LOS	C			D			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	26.1			16.2	10.1	35.8		16.2				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		4.6				
Max Green Setting (Gmax), s	39.7			31.4	8.7	39.7		31.4				
Max Q Clear Time (g_c+1/3), s	20.2			9.5	5.2	29.3		4.7				
Green Ext Time (p_c), s	0.0	0.6		0.2	0.0	1.2		0.1				

Intersection Summary

HCM 6th Ctrl Delay 35.7

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

7: N Dutton Ave/Westberry Dr & Guerneville Rd

Lance Drive Residential TIA
Cumulative PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	730	120	530	970	30	180	10	520	10	10	10
Future Volume (veh/h)	10	730	120	530	970	30	180	10	520	10	10	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	11	785	121	570	1043	31	202	0	208	11	11	7
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	28	816	126	1409	2313	69	212	0	740	30	30	19
Arrive On Green	0.02	0.27	0.27	0.41	0.66	0.66	0.06	0.00	0.06	0.05	0.05	0.05
Sat Flow, veh/h	1767	3051	470	3428	3492	104	3534	0	1557	658	658	419
Grp Volume(v), veh/h	11	453	453	570	526	548	202	0	208	29	0	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1759	1714	1763	1834	1767	0	1557	1736	0	0
Q Serve(g_s), s	0.6	24.1	24.1	11.2	13.7	13.7	5.4	0.0	0.0	1.5	0.0	0.0
Cycle Q Clear(g_c), s	0.6	24.1	24.1	11.2	13.7	13.7	5.4	0.0	0.0	1.5	0.0	0.0
Prop In Lane	1.00		0.27	1.00		0.06	1.00		1.00	0.38		0.24
Lane Grp Cap(c), veh/h	28	471	470	1409	1168	1215	212	0	740	80	0	0
V/C Ratio(X)	0.39	0.96	0.96	0.40	0.45	0.45	0.95	0.00	0.28	0.36	0.00	0.00
Avail Cap(c_a), veh/h	112	471	470	1409	1168	1215	212	0	740	506	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.95	0.95	0.95	0.48	0.48	0.48	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	46.3	34.3	34.3	19.8	7.7	7.7	44.5	0.0	15.3	44.0	0.0	0.0
Incr Delay (d2), s/veh	3.1	32.0	32.1	0.0	0.6	0.6	47.9	0.0	0.1	1.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	13.9	13.9	4.2	4.4	4.5	3.7	0.0	2.6	0.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.4	66.4	66.4	19.8	8.3	8.3	92.4	0.0	15.4	45.0	0.0	0.0
LnGrp LOS	D	E	E	B	A	A	F	A	B	D	A	A
Approach Vol, veh/h	917			1644			410			29		
Approach Delay, s/veh	66.2			12.3			53.4			45.0		
Approach LOS	E			B			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	44.3	30.7		9.0	6.8	68.2		11.0				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		5.3				
Max Green Setting (Gmax), s	55.8	25.4		27.7	6.0	35.1		5.7				
Max Q Clear Time (g_c+I1), s	113.2	26.1		3.5	2.6	15.7		7.4				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	0.9		0.0				

Intersection Summary

HCM 6th Ctrl Delay 34.7

HCM 6th LOS C

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

8: Herbert St/Coffey Ln & Guerneville Rd

Lance Drive Residential TIA
Cumulative PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	200	980	70	60	1250	110	50	30	40	120	30	270
Future Volume (veh/h)	200	980	70	60	1250	110	50	30	40	120	30	270
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.99	1.00		0.94	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	217	1065	72	65	1359	116	54	33	26	130	33	94
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	181	1101	74	456	1593	135	88	54	42	186	47	356
Arrive On Green	0.10	0.33	0.33	0.26	0.48	0.48	0.11	0.11	0.11	0.13	0.13	0.13
Sat Flow, veh/h	1767	3341	226	1767	3286	279	819	501	394	1423	361	1491
Grp Volume(v), veh/h	217	562	575	65	727	748	113	0	0	163	0	94
Grp Sat Flow(s),veh/h/ln	1767	1763	1804	1767	1763	1802	1714	0	0	1784	0	1491
Q Serve(g_s), s	11.8	36.1	36.1	3.3	41.5	42.1	7.2	0.0	0.0	10.1	0.0	5.9
Cycle Q Clear(g_c), s	11.8	36.1	36.1	3.3	41.5	42.1	7.2	0.0	0.0	10.1	0.0	5.9
Prop In Lane	1.00		0.13	1.00		0.15	0.48		0.23	0.80		1.00
Lane Grp Cap(c), veh/h	181	581	595	456	855	874	184	0	0	233	0	356
V/C Ratio(X)	1.20	0.97	0.97	0.14	0.85	0.86	0.61	0.00	0.00	0.70	0.00	0.26
Avail Cap(c_a), veh/h	181	581	595	456	855	874	373	0	0	403	0	499
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.77	0.77	0.77	0.69	0.69	0.69	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	51.6	37.9	37.9	32.9	26.0	26.1	49.1	0.0	0.0	47.9	0.0	36.1
Incr Delay (d2), s/veh	122.2	25.6	25.4	0.0	7.4	7.6	1.2	0.0	0.0	1.4	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	19.0	19.4	1.4	18.0	18.6	3.2	0.0	0.0	4.5	0.0	2.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	173.8	63.5	63.3	32.9	33.4	33.7	50.3	0.0	0.0	49.3	0.0	36.2
LnGrp LOS	F	E	E	C	C	C	D	A	A	D	A	D
Approach Vol, veh/h	1354			1540			113			257		
Approach Delay, s/veh	81.1			33.5			50.3			44.5		
Approach LOS	F			C			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	35.0	43.2		19.9	17.1	61.1		16.9				
Change Period (Y+Rc), s	5.3	5.3		4.9	5.3	5.3		4.6				
Max Green Setting (Gmax), s	6.0	37.9		26.0	11.8	32.1		25.0				
Max Q Clear Time (g_c+1/3), s	15.3	38.1		12.1	13.8	44.1		9.2				
Green Ext Time (p_c), s	0.0	0.0		0.1	0.0	0.0		0.1				

Intersection Summary

HCM 6th Ctrl Delay	54.7
HCM 6th LOS	D

HCM 6th Signalized Intersection Summary

9: Range Ave & Guerneville Rd

Lance Drive Residential TIA
Cumulative PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	180	690	240	100	850	20	330	190	170	100	270	290
Future Volume (veh/h)	180	690	240	100	850	20	330	190	170	100	270	290
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No		No				No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	188	719	0	104	885	0	215	379	102	104	281	141
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	389	1530		112	977		323	514	136	184	235	114
Arrive On Green	0.22	0.43	0.00	0.06	0.28	0.00	0.18	0.18	0.18	0.03	0.03	0.03
Sat Flow, veh/h	1767	3618	0	1767	3618	0	1767	2810	746	1767	2256	1090
Grp Volume(v), veh/h	188	719	0	104	885	0	215	248	233	104	217	205
Grp Sat Flow(s),veh/h/ln	1767	1763	0	1767	1763	0	1767	1856	1701	1767	1763	1584
Q Serve(g_s), s	8.8	13.8	0.0	5.6	23.0	0.0	10.8	12.0	12.3	5.5	9.9	9.9
Cycle Q Clear(g_c), s	8.8	13.8	0.0	5.6	23.0	0.0	10.8	12.0	12.3	5.5	9.9	9.9
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.44	1.00		0.69
Lane Grp Cap(c), veh/h	389	1530		112	977		323	339	311	184	184	165
V/C Ratio(X)	0.48	0.47		0.93	0.91		0.67	0.73	0.75	0.56	1.18	1.24
Avail Cap(c_a), veh/h	389	1530		112	1058		560	588	539	184	184	165
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	0.75	0.75	0.00	0.90	0.90	0.00	1.00	1.00	1.00	0.56	0.56	0.56
Uniform Delay (d), s/veh	32.3	19.1	0.0	44.3	33.1	0.0	36.1	36.6	36.7	43.7	45.9	45.9
Incr Delay (d2), s/veh	0.3	0.8	0.0	59.2	9.2	0.0	0.9	1.2	1.4	1.4	108.9	133.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	5.4	0.0	4.2	10.7	0.0	4.7	5.5	5.2	2.5	10.1	10.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.6	19.9	0.0	103.5	42.3	0.0	37.0	37.8	38.1	45.1	154.8	179.7
LnGrp LOS	C	B		F	D		D	D	D	D	F	F
Approach Vol, veh/h	907		A		989		A		696		526	
Approach Delay, s/veh	22.5				48.7				37.6		142.8	
Approach LOS	C				D				D		F	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	1.3	46.5		15.2	26.2	31.6		22.0				
Change Period (Y+Rc), s	5.3	5.3		5.3	5.3	5.3		4.6				
Max Green Setting (Gmax), s	6.0	28.5		9.9	6.0	28.5		30.1				
Max Q Clear Time (g_c+11), s	6.0	15.8		11.9	10.8	25.0		14.3				
Green Ext Time (p_c), s	0.0	0.8		0.0	0.0	0.6		0.4				

Intersection Summary

HCM 6th Ctrl Delay 54.5
HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

10: Guerneville Rd & Steele Wy

Lance Drive Residential TIA
Cumulative PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	820	120	160	860	10	80	50	190	380	60	30
Future Volume (veh/h)	20	820	120	160	860	10	80	50	190	380	60	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	20	837	95	163	878	10	66	73	102	432	0	15
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	564	1819	950	221	932	11	169	177	249	525	0	729
Arrive On Green	0.32	0.52	0.52	0.06	0.26	0.26	0.10	0.10	0.10	0.15	0.00	0.15
Sat Flow, veh/h	1767	3526	1550	3428	3570	41	1767	1856	1538	3534	0	1530
Grp Volume(v), veh/h	20	837	95	163	434	454	66	73	102	432	0	15
Grp Sat Flow(s), veh/h/ln	1767	1763	1550	1714	1763	1848	1767	1856	1538	1767	0	1530
Q Serve(g_s), s	0.9	16.6	2.8	5.1	26.5	26.5	3.9	4.1	6.6	13.0	0.0	0.0
Cycle Q Clear(g_c), s	0.9	16.6	2.8	5.1	26.5	26.5	3.9	4.1	6.6	13.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.02	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	564	1819	950	221	460	483	169	177	249	525	0	729
V/C Ratio(X)	0.04	0.46	0.10	0.74	0.94	0.94	0.39	0.41	0.41	0.82	0.00	0.02
Avail Cap(c_a), veh/h	564	1819	950	221	476	499	434	455	479	868	0	877
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.71	0.71	0.71	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	25.8	16.9	8.8	50.5	39.8	39.8	46.7	46.8	41.5	45.4	0.0	15.7
Incr Delay (d2), s/veh	0.0	0.6	0.1	10.7	26.4	25.6	0.5	0.6	0.4	1.3	0.0	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	6.6	1.2	2.5	14.6	15.2	1.7	1.9	2.5	5.8	0.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	25.8	17.5	9.0	61.3	66.2	65.4	47.3	47.4	42.0	46.7	0.0	15.7
LnGrp LOS	C	B	A	E	E	E	D	D	D	D	A	B
Approach Vol, veh/h	952			1051			241			447		
Approach Delay, s/veh	16.8			65.1			45.1			45.6		
Approach LOS	B			E			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	2.0	61.6		21.2	40.0	33.6		15.1				
Change Period (Y+Rc), s	4.9	4.9		4.9	4.9	4.9		4.6				
Max Green Setting (Gmax), s	29.6			27.0	7.0	29.7		27.0				
Max Q Clear Time (g_c+11), s	18.6			15.0	2.9	28.5		8.6				
Green Ext Time (p_c), s	0.0	1.0		0.1	0.0	0.2		0.1				

Intersection Summary

HCM 6th Ctrl Delay 43.0

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

11: Cleveland Ave & Guerneville Rd

Lance Drive Residential TIA
Cumulative PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↑↑↓		↰↱	↑↑	↱	↰	↑↑		↰	↱↱	
Traffic Volume (veh/h)	140	1180	90	370	1360	240	110	160	280	490	410	140
Future Volume (veh/h)	140	1180	90	370	1360	240	110	160	280	490	410	140
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.98	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	146	1229	86	385	1417	184	115	167	98	355	644	127
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	247	1488	104	456	1303	569	200	245	135	422	715	141
Arrive On Green	0.07	0.31	0.31	0.04	0.12	0.12	0.11	0.11	0.11	0.24	0.24	0.24
Sat Flow, veh/h	3428	4824	337	3428	3526	1539	1767	2164	1193	1767	2995	590
Grp Volume(v), veh/h	146	860	455	385	1417	184	115	134	131	355	398	373
Grp Sat Flow(s),veh/h/ln	1714	1689	1784	1714	1763	1539	1767	1763	1595	1767	1856	1730
Q Serve(g_s), s	3.9	22.5	22.5	10.6	35.1	10.4	5.9	6.9	7.5	18.2	19.8	19.9
Cycle Q Clear(g_c), s	3.9	22.5	22.5	10.6	35.1	10.4	5.9	6.9	7.5	18.2	19.8	19.9
Prop In Lane	1.00		0.19	1.00		1.00	1.00		0.75	1.00		0.34
Lane Grp Cap(c), veh/h	247	1042	550	456	1303	569	200	200	181	422	443	413
V/C Ratio(X)	0.59	0.83	0.83	0.84	1.09	0.32	0.57	0.67	0.72	0.84	0.90	0.90
Avail Cap(c_a), veh/h	256	1042	550	798	1303	569	200	200	181	467	490	457
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.43	0.43	0.43	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.7	30.5	30.5	44.4	41.7	30.9	39.9	40.4	40.7	34.5	35.1	35.1
Incr Delay (d2), s/veh	2.2	5.2	9.4	0.7	45.9	0.1	11.4	16.5	22.2	11.0	17.3	18.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	9.5	10.7	4.8	24.7	4.2	3.2	3.9	4.0	8.8	10.7	10.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.9	35.7	39.9	45.2	87.6	30.9	51.3	56.9	62.9	45.4	52.4	53.8
LnGrp LOS	D	D	D	D	F	C	D	E	E	D	D	D
Approach Vol, veh/h	1461			1986			380			1126		
Approach Delay, s/veh	37.9			74.1			57.3			50.6		
Approach LOS	D			E			E			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.5	34.2		15.7	11.8	40.0		27.6				
Change Period (Y+Rc), s	4.9	4.9		4.9	4.9	4.9		4.9				
Max Green Setting (Gmax), s	22.5	20.1		8.1	7.1	35.1		25.1				
Max Q Clear Time (g_c+I1), s	11.6	24.5		9.5	5.9	37.1		21.9				
Green Ext Time (p_c), s	0.1	0.0		0.0	0.0	0.0		0.4				

Intersection Summary

HCM 6th Ctrl Delay 56.8

HCM 6th LOS E

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 12: US 101 SB Ramps & Guerneville Rd

Lance Drive Residential TIA
Cumulative PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑					↑	↑	↑
Traffic Volume (veh/h)	0	1330	650	350	1620	0	0	0	0	350	80	360
Future Volume (veh/h)	0	1330	650	350	1620	0	0	0	0	350	80	360
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1856	1856	1856	1856	0				1856	1856	1856
Adj Flow Rate, veh/h	0	1371	279	361	1670	0				420	0	337
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	1633	490	426	1757	0				1420	0	632
Arrive On Green	0.00	0.32	0.32	0.12	0.50	0.00				0.40	0.00	0.40
Sat Flow, veh/h	0	5233	1519	3428	3618	0				3534	0	1572
Grp Volume(v), veh/h	0	1371	279	361	1670	0				420	0	337
Grp Sat Flow(s),veh/h/ln	0	1689	1519	1714	1763	0				1767	0	1572
Q Serve(g_s), s	0.0	23.9	14.5	9.8	42.9	0.0				7.7	0.0	15.5
Cycle Q Clear(g_c), s	0.0	23.9	14.5	9.8	42.9	0.0				7.7	0.0	15.5
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1633	490	426	1757	0				1420	0	632
V/C Ratio(X)	0.00	0.84	0.57	0.85	0.95	0.00				0.30	0.00	0.53
Avail Cap(c_a), veh/h	0	1925	577	516	2052	0				1420	0	632
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.33	0.33	0.50	0.50	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	29.9	26.7	40.7	22.7	0.0				19.3	0.0	21.6
Incr Delay (d2), s/veh	0.0	0.9	0.1	4.9	5.2	0.0				0.5	0.0	3.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	9.4	5.1	4.3	17.4	0.0				3.0	0.0	5.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	30.8	26.8	45.6	27.9	0.0				19.8	0.0	24.9
LnGrp LOS	A	C	C	D	C	A				B	A	C
Approach Vol, veh/h		1650			2031						757	
Approach Delay, s/veh		30.1			31.1						22.1	
Approach LOS		C			C						C	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	6.7	35.5		42.8		52.2						
Change Period (Y+Rc), s	4.9	4.9		4.6		4.9						
Max Green Setting (Gmax), s	4.3	36.1		30.2		55.3						
Max Q Clear Time (g_c+I1), s	11.8	25.9		17.5		44.9						
Green Ext Time (p_c), s	0.0	1.9		0.1		2.5						

Intersection Summary

HCM 6th Ctrl Delay	29.2
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 13: US 101 NB Ramps & Guerneville Rd/Steele Ln

Lance Drive Residential TIA
Cumulative PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↱↱			↰↱↱		↰	↰↱	↱			
Traffic Volume (veh/h)	460	1220	0	0	1180	280	790	10	400	0	0	0
Future Volume (veh/h)	460	1220	0	0	1180	280	790	10	400	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1856	1856	0	0	1856	1856	1856	1856	1856			
Adj Flow Rate, veh/h	479	1271	0	0	1229	265	936	0	236			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	3	3	0	0	3	3	3	3	3			
Cap, veh/h	849	2181	0	0	1327	286	994	0	442			
Arrive On Green	0.50	1.00	0.00	0.00	0.32	0.32	0.28	0.00	0.28			
Sat Flow, veh/h	3428	3618	0	0	4320	895	3534	0	1572			
Grp Volume(v), veh/h	479	1271	0	0	999	495	936	0	236			
Grp Sat Flow(s),veh/h/ln	1714	1763	0	0	1689	1671	1767	0	1572			
Q Serve(g_s), s	9.3	0.0	0.0	0.0	27.2	27.2	24.6	0.0	12.1			
Cycle Q Clear(g_c), s	9.3	0.0	0.0	0.0	27.2	27.2	24.6	0.0	12.1			
Prop In Lane	1.00		0.00	0.00		0.54	1.00		1.00			
Lane Grp Cap(c), veh/h	849	2181	0	0	1079	534	994	0	442			
V/C Ratio(X)	0.56	0.58	0.00	0.00	0.93	0.93	0.94	0.00	0.53			
Avail Cap(c_a), veh/h	849	2181	0	0	1177	582	1168	0	520			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.63	0.63	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	20.4	0.0	0.0	0.0	31.2	31.2	33.4	0.0	28.9			
Incr Delay (d2), s/veh	0.3	0.7	0.0	0.0	11.3	19.3	12.5	0.0	0.4			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	3.0	0.2	0.0	0.0	12.2	13.3	11.5	0.0	4.3			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.7	0.7	0.0	0.0	42.5	50.5	45.9	0.0	29.2			
LnGrp LOS	C	A	A	A	D	D	D	A	C			
Approach Vol, veh/h	1750			1494			1172					
Approach Delay, s/veh	6.2			45.2			42.5					
Approach LOS	A			D			D					
Timer - Assigned Phs	2			5			6			8		
Phs Duration (G+Y+Rc), s	63.7			28.4			35.3			31.3		
Change Period (Y+Rc), s	4.9			4.9			4.9			4.6		
Max Green Setting (Gmax), s	54.1			16.1			33.1			31.4		
Max Q Clear Time (g_c+I1), s	2.0			11.3			29.2			26.6		
Green Ext Time (p_c), s	1.9			0.1			1.2			0.1		

Intersection Summary

HCM 6th Ctrl Delay	29.0
HCM 6th LOS	C










Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 14: Stony Point Rd/Marlow Rd & W College Ave

Lance Drive Residential TIA
Cumulative PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	290	130	260	400	230	190	890	300	190	970	120
Future Volume (veh/h)	80	290	130	260	400	230	190	890	300	190	970	120
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No				No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	84	305	97	274	421	176	200	937	193	200	1021	115
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	232	388	121	359	531	219	235	1079	792	212	936	105
Arrive On Green	0.13	0.15	0.15	0.20	0.22	0.22	0.13	0.31	0.31	0.12	0.29	0.29
Sat Flow, veh/h	1767	2632	820	1767	2420	1000	1767	3526	1545	1767	3188	359
Grp Volume(v), veh/h	84	202	200	274	305	292	200	937	193	200	564	572
Grp Sat Flow(s),veh/h/ln	1767	1763	1689	1767	1763	1657	1767	1763	1545	1767	1763	1784
Q Serve(g_s), s	4.1	10.5	10.9	13.9	15.5	15.8	10.5	23.9	2.8	10.7	27.9	27.9
Cycle Q Clear(g_c), s	4.1	10.5	10.9	13.9	15.5	15.8	10.5	23.9	2.8	10.7	27.9	27.9
Prop In Lane	1.00		0.49	1.00		0.60	1.00		1.00	1.00		0.20
Lane Grp Cap(c), veh/h	232	260	249	359	387	364	235	1079	792	212	517	523
V/C Ratio(X)	0.36	0.78	0.80	0.76	0.79	0.80	0.85	0.87	0.24	0.94	1.09	1.09
Avail Cap(c_a), veh/h	232	328	315	359	388	364	292	1176	835	212	517	523
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.17	0.17	0.17	1.00	1.00	1.00	0.30	0.30	0.30
Uniform Delay (d), s/veh	37.6	39.0	39.1	35.7	35.0	35.1	40.3	31.1	3.9	41.5	33.6	33.6
Incr Delay (d2), s/veh	1.0	8.8	11.1	1.7	1.9	2.3	17.7	6.7	0.2	21.1	50.9	51.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	5.0	5.1	5.9	6.6	6.3	5.6	10.6	1.0	5.7	18.5	18.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.6	47.8	50.3	37.4	36.9	37.4	58.0	37.8	4.1	62.6	84.5	84.9
LnGrp LOS	D	D	D	D	D	D	E	D	A	E	F	F
Approach Vol, veh/h	486		871			1330			1336			
Approach Delay, s/veh	47.2		37.2			36.0			81.4			
Approach LOS	D		D			D			F			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	24.6	19.3	17.9	33.2	17.8	26.2	16.7	34.4				
Change Period (Y+Rc), s	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3				
Max Green Setting (Gmax), s	17.7	17.7	15.7	27.4	9.8	20.9	11.4	31.7				
Max Q Clear Time (g_c+I1), s	12.9	12.9	12.5	29.9	6.1	17.8	12.7	25.9				
Green Ext Time (p_c), s	0.0	0.9	0.2	0.0	0.0	1.0	0.0	3.2				

Intersection Summary

HCM 6th Ctrl Delay 52.7

HCM 6th LOS D









Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary 15: N Dutton Ave & W College Ave

Lance Drive Residential TIA
Cumulative PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	670	120	220	900	190	170	380	150	350	580	160
Future Volume (veh/h)	100	670	120	220	900	190	170	380	150	350	580	160
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	104	698	113	229	938	183	177	396	121	365	604	141
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	130	737	119	260	957	187	314	478	144	486	784	183
Arrive On Green	0.07	0.24	0.24	0.15	0.33	0.33	0.18	0.18	0.18	0.27	0.28	0.28
Sat Flow, veh/h	1767	3030	490	1767	2933	572	1767	2654	801	1767	2827	658
Grp Volume(v), veh/h	104	406	405	229	563	558	177	261	256	365	376	369
Grp Sat Flow(s),veh/h/ln	1767	1763	1758	1767	1763	1742	1767	1763	1692	1767	1763	1722
Q Serve(g_s), s	5.5	21.5	21.5	12.1	30.1	30.1	8.7	13.6	13.9	17.9	18.6	18.7
Cycle Q Clear(g_c), s	5.5	21.5	21.5	12.1	30.1	30.1	8.7	13.6	13.9	17.9	18.6	18.7
Prop In Lane	1.00		0.28	1.00		0.33	1.00		0.47	1.00		0.38
Lane Grp Cap(c), veh/h	130	429	427	260	575	568	314	317	305	486	489	478
V/C Ratio(X)	0.80	0.95	0.95	0.88	0.98	0.98	0.56	0.82	0.84	0.75	0.77	0.77
Avail Cap(c_a), veh/h	130	429	427	260	575	568	318	408	392	486	501	489
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.71	0.71	0.71	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.3	35.3	35.4	39.7	31.7	31.7	35.7	37.5	37.6	31.5	31.5	31.6
Incr Delay (d2), s/veh	20.1	23.9	24.2	26.4	32.1	32.7	1.4	8.1	9.8	5.8	6.3	6.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	11.7	11.7	7.0	17.3	17.2	3.8	6.4	6.4	8.0	8.4	8.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	63.4	59.3	59.6	66.0	63.8	64.4	37.1	45.6	47.5	37.3	37.8	38.1
LnGrp LOS	E	E	E	E	E	E	D	D	D	D	D	D
Approach Vol, veh/h	915			1350			694			1110		
Approach Delay, s/veh	59.9			64.4			44.1			37.7		
Approach LOS	E			E			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.9	27.0	19.9	30.2	10.0	34.9	29.1	21.0				
Change Period (Y+Rc), s	3.9	* 3.9	3.0	3.9	3.0	3.9	3.0	3.9				
Max Green Setting (Gmax), s	4.0	* 23	17.1	27.0	7.0	30.1	22.1	22.0				
Max Q Clear Time (g_c+14, s)	14.5	23.5	10.7	20.7	7.5	32.1	19.9	15.9				
Green Ext Time (p_c), s	0.0	0.0	0.0	1.0	0.0	0.0	0.1	0.7				

Intersection Summary

HCM 6th Ctrl Delay 52.7
HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection

Intersection Delay, s/veh 7.4

Intersection LOS A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	0	0	0	90	0	0	0	80	0	0
Future Vol, veh/h	0	0	0	0	0	90	0	0	0	80	0	0
Peak Hour Factor	0.86	0.86	0.92	0.92	0.86	0.86	0.92	0.92	0.92	0.86	0.92	0.86
Heavy Vehicles, %	3	3	2	2	3	3	2	2	2	3	2	3
Mvmt Flow	0	0	0	0	0	105	0	0	0	93	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0























Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	0	7	0	7.9
HCM LOS	-	A	-	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	0%	0%	100%
Vol Thru, %	100%	100%	0%	0%
Vol Right, %	0%	0%	100%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	0	0	90	80
LT Vol	0	0	0	80
Through Vol	0	0	0	0
RT Vol	0	0	90	0
Lane Flow Rate	0	0	105	93
Geometry Grp	1	1	1	1
Degree of Util (X)	0	0	0.102	0.112
Departure Headway (Hd)	4.19	4.196	3.513	4.334
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	0	0	1010	829
Service Time	2.233	2.262	1.57	2.352
HCM Lane V/C Ratio	0	0	0.104	0.112
HCM Control Delay	7.2	7.3	7	7.9
HCM Lane LOS	N	N	A	A
HCM 95th-tile Q	0	0	0.3	0.4

HCM 6th Signalized Intersection Summary







1: Marlow Rd & Marlow Ct/W Steele Ln

Lance Drive Residential TIA
Cumulative PM (120 Seconds)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	0	10	200	10	170	10	750	200	130	850	10
Future Volume (veh/h)	10	0	10	200	10	170	10	750	200	130	850	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	11	0	0	219	0	110	11	789	150	137	895	10
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	48	0	0	1632	0	872	23	911	1119	167	1215	14
Arrive On Green	0.03	0.00	0.00	0.46	0.00	0.46	0.01	0.26	0.26	0.09	0.34	0.34
Sat Flow, veh/h	1767	0	0	3534	0	1567	1767	3526	1519	1767	3570	40
Grp Volume(v), veh/h	11	0	0	219	0	110	11	789	150	137	442	463
Grp Sat Flow(s),veh/h/ln	1767	0	0	1767	0	1567	1767	1763	1519	1767	1763	1848
Q Serve(g_s), s	0.7	0.0	0.0	4.3	0.0	0.0	0.7	25.7	3.7	9.1	26.5	26.5
Cycle Q Clear(g_c), s	0.7	0.0	0.0	4.3	0.0	0.0	0.7	25.7	3.7	9.1	26.5	26.5
Prop In Lane	1.00		0.00	1.00		1.00	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	48	0	0	1632	0	872	23	911	1119	167	600	629
V/C Ratio(X)	0.23	0.00	0.00	0.13	0.00	0.13	0.49	0.87	0.13	0.82	0.74	0.74
Avail Cap(c_a), veh/h	227	0	0	1632	0	872	149	1031	1170	517	883	925
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.61	0.61	0.61	1.00	1.00	1.00
Uniform Delay (d), s/veh	57.2	0.0	0.0	18.5	0.0	12.7	58.8	42.5	5.2	53.3	34.8	34.8
Incr Delay (d2), s/veh	2.4	0.0	0.0	0.2	0.0	0.3	9.6	4.6	0.0	9.5	1.8	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	1.8	0.0	1.5	0.4	11.6	3.6	4.5	11.4	12.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.6	0.0	0.0	18.7	0.0	13.0	68.4	47.1	5.2	62.8	36.6	36.6
LnGrp LOS	E	A	A	B	A	B	E	D	A	E	D	D
Approach Vol, veh/h		11			329			950			1042	
Approach Delay, s/veh		59.6			16.8			40.7			40.0	
Approach LOS		E			B			D			D	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		60.0	6.4	45.7		7.8	16.3	35.9				
Change Period (Y+Rc), s		4.6	4.9	4.9		4.6	4.9	4.9				
Max Green Setting (Gmax), s		15.4	10.1	60.1		15.4	35.1	35.1				
Max Q Clear Time (g_c+I1), s		6.3	2.7	28.5		2.7	11.1	27.7				
Green Ext Time (p_c), s		0.8	0.0	6.4		0.0	0.3	3.4				
Intersection Summary												
HCM 6th Ctrl Delay				37.1								
HCM 6th LOS				D								
Notes												
User approved pedestrian interval to be less than phase max green.												
User approved volume balancing among the lanes for turning movement.												






















HCM 6th TWSC
2: Iroquois St/Apple Valley Ln & W Steele Ln

Lance Drive Residential TIA
Cumulative PM (120 Seconds)

Intersection												
Int Delay, s/veh	6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	30	340	50	50	530	50	50	10	30	30	20	30
Future Vol, veh/h	30	340	50	50	530	50	50	10	30	30	20	30
Conflicting Peds, #/hr	9	0	9	9	0	9	1	0	2	2	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	60	-	-	80	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	32	358	53	53	558	53	53	11	32	32	21	32
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	620	0	0	420	0	0	1176	1184	396	1172	1184	595
Stage 1	-	-	-	-	-	-	458	458	-	700	700	-
Stage 2	-	-	-	-	-	-	718	726	-	472	484	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	956	-	-	1134	-	-	167	188	651	168	188	502
Stage 1	-	-	-	-	-	-	581	565	-	428	440	-
Stage 2	-	-	-	-	-	-	419	428	-	571	550	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	948	-	-	1124	-	-	132	170	644	142	170	497
Mov Cap-2 Maneuver	-	-	-	-	-	-	132	170	-	142	170	-
Stage 1	-	-	-	-	-	-	557	541	-	410	415	-
Stage 2	-	-	-	-	-	-	355	404	-	513	526	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.6			0.7			42.9			34.1		
HCM LOS							E			D		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	186	948	-	-	1124	-	-	206				
HCM Lane V/C Ratio	0.509	0.033	-	-	0.047	-	-	0.409				
HCM Control Delay (s)	42.9	8.9	-	-	8.4	-	-	34.1				
HCM Lane LOS	E	A	-	-	A	-	-	D				
HCM 95th %tile Q(veh)	2.5	0.1	-	-	0.1	-	-	1.9				

HCM 6th Signalized Intersection Summary 3: Range Ave & W Steele Ln

Lance Drive Residential TIA
Cumulative PM (120 Seconds)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	370	80	70	500	60	100	240	50	70	510	60
Future Volume (veh/h)	50	370	80	70	500	60	100	240	50	70	510	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.96	1.00		0.93
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	52	385	78	73	521	60	104	250	34	73	531	50
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	467	977	198	552	1069	123	128	436	58	194	599	56
Arrive On Green	0.65	0.65	0.65	0.65	0.65	0.65	0.07	0.14	0.14	0.11	0.19	0.19
Sat Flow, veh/h	826	1492	302	921	1633	188	1767	3107	416	1767	3233	303
Grp Volume(v), veh/h	52	0	463	73	0	581	104	140	144	73	289	292
Grp Sat Flow(s),veh/h/ln	826	0	1795	921	0	1821	1767	1763	1761	1767	1763	1773
Q Serve(g_s), s	4.1	0.0	14.4	4.8	0.0	19.4	7.0	8.9	9.2	4.6	19.1	19.3
Cycle Q Clear(g_c), s	23.5	0.0	14.4	19.2	0.0	19.4	7.0	8.9	9.2	4.6	19.1	19.3
Prop In Lane	1.00		0.17	1.00		0.10	1.00		0.24	1.00		0.17
Lane Grp Cap(c), veh/h	467	0	1175	552	0	1192	128	247	247	194	327	329
V/C Ratio(X)	0.11	0.00	0.39	0.13	0.00	0.49	0.81	0.57	0.58	0.38	0.88	0.89
Avail Cap(c_a), veh/h	467	0	1175	552	0	1192	236	560	559	194	486	489
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.49	0.49	0.49	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.5	0.0	9.6	14.1	0.0	10.5	54.8	48.2	48.3	49.6	47.6	47.7
Incr Delay (d2), s/veh	0.5	0.0	1.0	0.5	0.0	1.4	2.3	0.4	0.4	0.4	9.0	9.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	5.6	1.1	0.0	7.7	3.1	3.9	4.0	2.0	9.0	9.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.9	0.0	10.6	14.6	0.0	11.9	57.2	48.5	48.7	50.0	56.6	57.4
LnGrp LOS	B	A	B	B	A	B	E	D	D	D	E	E
Approach Vol, veh/h		515			654			388			654	
Approach Delay, s/veh		11.3			12.2			50.9			56.2	
Approach LOS		B			B			D			E	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		82.2	11.7	26.1		82.2	17.1	20.7				
Change Period (Y+Rc), s		3.6	3.0	3.9		3.6	3.9	*3.9				
Max Green Setting (Gmax), s		60.4	16.0	33.1		60.4	11.0	*38				
Max Q Clear Time (g_c+I1), s		25.5	9.0	21.3		21.4	6.6	11.2				
Green Ext Time (p_c), s		1.1	0.0	0.9		1.4	0.0	0.5				
Intersection Summary												
HCM 6th Ctrl Delay			31.8									
HCM 6th LOS			C									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												











HCM 6th Signalized Intersection Summary

4: Marlow Rd & Guerneville Rd

Lance Drive Residential TIA

Cumulative PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	200	480	150	310	540	140	160	720	190	80	840	90
Future Volume (veh/h)	200	480	150	310	540	140	160	720	190	80	840	90
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	211	505	78	326	568	128	168	758	112	84	884	89
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	239	640	432	349	704	158	172	888	698	237	931	94
Arrive On Green	0.14	0.18	0.18	0.20	0.25	0.25	0.10	0.25	0.25	0.09	0.19	0.19
Sat Flow, veh/h	1767	3526	1536	1767	2847	639	1767	3526	1539	1767	3228	325
Grp Volume(v), veh/h	211	505	78	326	351	345	168	758	112	84	483	490
Grp Sat Flow(s),veh/h/ln	1767	1763	1536	1767	1763	1724	1767	1763	1539	1767	1763	1790
Q Serve(g_s), s	14.1	16.4	2.1	21.8	22.5	22.6	11.4	24.6	0.0	5.4	32.5	32.5
Cycle Q Clear(g_c), s	14.1	16.4	2.1	21.8	22.5	22.6	11.4	24.6	0.0	5.4	32.5	32.5
Prop In Lane	1.00		1.00	1.00		0.37	1.00		1.00	1.00		0.18
Lane Grp Cap(c), veh/h	239	640	432	349	436	426	172	888	698	237	508	516
V/C Ratio(X)	0.88	0.79	0.18	0.93	0.81	0.81	0.98	0.85	0.16	0.35	0.95	0.95
Avail Cap(c_a), veh/h	284	831	516	349	480	470	172	1064	775	237	510	518
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67
Upstream Filter(I)	1.00	1.00	1.00	0.95	0.95	0.95	0.51	0.51	0.51	0.79	0.79	0.79
Uniform Delay (d), s/veh	51.0	46.9	10.8	47.4	42.5	42.5	54.0	42.8	19.6	49.7	47.5	47.5
Incr Delay (d2), s/veh	23.4	3.9	0.2	30.6	14.0	14.6	42.1	3.2	0.1	0.7	23.6	23.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.7	7.4	1.0	12.3	11.2	11.1	7.0	10.8	1.8	2.4	18.0	18.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	74.4	50.8	11.0	78.0	56.5	57.2	96.1	45.9	19.6	50.5	71.2	70.9
LnGrp LOS	E	D	B	E	E	E	F	D	B	D	E	E
Approach Vol, veh/h	794			1022			1038			1057		
Approach Delay, s/veh	53.2			63.6			51.2			69.4		
Approach LOS	D			E			D			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	29.4	27.5	17.0	39.9	21.5	35.4	21.4	35.5				
Change Period (Y+Rc), s	5.7	* 5.7	5.3	5.3	5.3	5.7	5.3	5.3				
Max Green Setting (Gmax), s	28.3	* 28	11.7	34.7	19.3	32.7	10.2	36.2				
Max Q Clear Time (g_c+Q), s	23.8	18.4	13.4	34.5	16.1	24.6	7.4	26.6				
Green Ext Time (p_c), s	0.0	2.4	0.0	0.1	0.2	2.6	0.0	3.7				

Intersection Summary

HCM 6th Ctrl Delay 59.8

HCM 6th LOS E

Notes







User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary 5: Ridley Ave & Guerneville Rd

Lance Drive Residential TIA
Cumulative PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	740	40	80	940	20	20	10	50	20	10	20
Future Volume (veh/h)	20	740	40	80	940	20	20	10	50	20	10	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	22	796	42	86	1011	22	22	11	3	22	11	0
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	519	3035	160	618	3142	68	89	35	7	96	38	0
Arrive On Green	0.89	0.89	0.89	0.89	0.89	0.89	0.05	0.05	0.05	0.05	0.05	0.00
Sat Flow, veh/h	541	3406	180	650	3526	77	800	681	135	891	737	0
Grp Volume(v), veh/h	22	412	426	86	505	528	36	0	0	33	0	0
Grp Sat Flow(s),veh/h/ln	541	1763	1823	650	1763	1840	1616	0	0	1628	0	0
Q Serve(g_s), s	0.8	4.0	4.0	2.6	5.2	5.2	0.3	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	6.0	4.0	4.0	6.6	5.2	5.2	2.4	0.0	0.0	2.1	0.0	0.0
Prop In Lane	1.00		0.10	1.00		0.04	0.61		0.08	0.67		0.00
Lane Grp Cap(c), veh/h	519	1571	1624	618	1571	1639	131	0	0	133	0	0
V/C Ratio(X)	0.04	0.26	0.26	0.14	0.32	0.32	0.27	0.00	0.00	0.25	0.00	0.00
Avail Cap(c_a), veh/h	519	1571	1624	618	1571	1639	470	0	0	471	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.84	0.84	0.84	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	1.5	0.9	0.9	1.4	1.0	1.0	55.1	0.0	0.0	55.0	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.3	0.3	0.0	0.0	0.0	0.4	0.0	0.0	0.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.3	0.3	0.1	0.2	0.2	1.1	0.0	0.0	1.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	1.6	1.3	1.3	1.4	1.0	1.0	55.5	0.0	0.0	55.3	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	E	A	A	E	A	A
Approach Vol, veh/h	860		1119			36			33			
Approach Delay, s/veh	1.3		1.1			55.5			55.3			
Approach LOS	A		A			E			E			
Timer - Assigned Phs	2		4			6			8			
Phs Duration (G+Y+Rc), s	110.8		9.2			110.8			9.2			
Change Period (Y+Rc), s	3.9		3.0			3.9			3.0			
Max Green Setting (Gmax), s	80.1		33.0			80.1			33.0			
Max Q Clear Time (g_c+I1), s	8.0		4.1			8.6			4.4			
Green Ext Time (p_c), s	1.7		0.1			2.4			0.1			
Intersection Summary												
HCM 6th Ctrl Delay			3.0									
HCM 6th LOS			A									

HCM 6th Signalized Intersection Summary 6: Lance Dr & Guerneville Rd

Lance Drive Residential TIA
Cumulative PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	680	20	70	1020	120	10	30	50	60	40	40
Future Volume (veh/h)	60	680	20	70	1020	120	10	30	50	60	40	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	0.99		0.99	0.99		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	62	708	20	73	1062	108	10	31	15	62	42	30
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	80	778	22	248	1120	488	53	130	54	118	68	41
Arrive On Green	0.01	0.07	0.07	0.19	0.42	0.42	0.12	0.12	0.12	0.12	0.12	0.12
Sat Flow, veh/h	1767	3499	99	1767	3526	1536	156	1120	467	641	591	355
Grp Volume(v), veh/h	62	357	371	73	1062	108	56	0	0	134	0	0
Grp Sat Flow(s), veh/h/ln	1767	1763	1835	1767	1763	1536	1742	0	0	1587	0	0
Q Serve(g_s), s	4.2	24.1	24.1	4.3	34.8	5.4	0.0	0.0	0.0	6.1	0.0	0.0
Cycle Q Clear(g_c), s	4.2	24.1	24.1	4.3	34.8	5.4	3.5	0.0	0.0	9.6	0.0	0.0
Prop In Lane	1.00		0.05	1.00		1.00	0.18		0.27	0.46		0.22
Lane Grp Cap(c), veh/h	80	392	408	248	1120	488	237	0	0	228	0	0
V/C Ratio(X)	0.78	0.91	0.91	0.29	0.95	0.22	0.24	0.00	0.00	0.59	0.00	0.00
Avail Cap(c_a), veh/h	202	848	882	248	1695	738	505	0	0	474	0	0
HCM Platoon Ratio	0.33	0.33	0.33	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.89	0.89	0.89	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	58.5	54.4	54.4	43.7	33.7	25.2	48.4	0.0	0.0	51.0	0.0	0.0
Incr Delay (d2), s/veh	5.9	3.4	3.3	0.2	15.6	0.9	0.2	0.0	0.0	0.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	11.8	12.2	1.8	15.5	2.0	1.6	0.0	0.0	4.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	64.5	57.8	57.7	43.9	49.3	26.1	48.6	0.0	0.0	51.9	0.0	0.0
LnGrp LOS	E	E	E	D	D	C	D	A	A	D	A	A
Approach Vol, veh/h	790			1243			56			134		
Approach Delay, s/veh	58.3			47.0			48.6			51.9		
Approach LOS	E			D			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	32.2	32.0		18.5	10.7	43.4		18.5				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		4.6				
Max Green Setting (Gmax), s	33.4	57.7		33.4	13.7	57.7		33.4				
Max Q Clear Time (g_c+10), s	26.1	26.1		11.6	6.2	36.8		5.5				
Green Ext Time (p_c), s	0.0	0.6		0.2	0.0	1.3		0.1				

Intersection Summary

HCM 6th Ctrl Delay 51.3
HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

7: N Dutton Ave/Westberry Dr & Guerneville Rd

Lance Drive Residential TIA
Cumulative PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	730	120	530	970	30	180	10	520	10	10	10
Future Volume (veh/h)	10	730	120	530	970	30	180	10	520	10	10	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.99	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	11	785	121	570	1043	31	202	0	208	11	11	7
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	27	833	128	1511	2439	72	258	0	807	28	28	18
Arrive On Green	0.02	0.27	0.27	0.88	1.00	1.00	0.07	0.00	0.07	0.04	0.04	0.04
Sat Flow, veh/h	1767	3051	470	3428	3493	104	3534	0	1560	658	658	419
Grp Volume(v), veh/h	11	453	453	570	526	548	202	0	208	29	0	0
Grp Sat Flow(s), veh/h/ln	1767	1763	1759	1714	1763	1834	1767	0	1560	1734	0	0
Q Serve(g_s), s	0.7	30.2	30.2	3.5	0.0	0.0	6.7	0.0	0.0	2.0	0.0	0.0
Cycle Q Clear(g_c), s	0.7	30.2	30.2	3.5	0.0	0.0	6.7	0.0	0.0	2.0	0.0	0.0
Prop In Lane	1.00		0.27	1.00		0.06	1.00		1.00	0.38		0.24
Lane Grp Cap(c), veh/h	27	481	480	1511	1231	1280	258	0	807	74	0	0
V/C Ratio(X)	0.41	0.94	0.94	0.38	0.43	0.43	0.78	0.00	0.26	0.39	0.00	0.00
Avail Cap(c_a), veh/h	88	535	533	1511	1231	1280	345	0	845	400	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.96	0.96	0.96	0.53	0.53	0.53	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	58.5	42.7	42.7	4.2	0.0	0.0	54.7	0.0	16.3	55.9	0.0	0.0
Incr Delay (d2), s/veh	3.4	28.2	28.3	0.0	0.6	0.6	5.6	0.0	0.1	1.3	0.0	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	0.4	16.5	16.5	1.0	0.2	0.2	3.2	0.0	3.1	0.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	62.0	71.0	71.0	4.2	0.6	0.6	60.3	0.0	16.4	57.2	0.0	0.0
LnGrp LOS	E	E	E	A	A	A	E	A	B	E	A	A
Approach Vol, veh/h	917			1644			410			29		
Approach Delay, s/veh	70.9			1.8			38.0			57.2		
Approach LOS	E			A			D			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	58.2	38.0		9.7	7.1	89.1		14.1				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		5.3				
Max Green Setting (Gmax), s	28.3	36.4		27.7	6.0	54.1		11.7				
Max Q Clear Time (g_c+15), s	15.5	32.2		4.0	2.7	2.0		8.7				
Green Ext Time (p_c), s	0.1	0.5		0.0	0.0	0.9		0.0				

Intersection Summary

HCM 6th Ctrl Delay	28.4
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 8: Herbert St/Coffey Ln & Guerneville Rd

Lance Drive Residential TIA
Cumulative PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	200	980	70	60	1250	110	50	30	40	120	30	270
Future Volume (veh/h)	200	980	70	60	1250	110	50	30	40	120	30	270
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.99	1.00		0.94	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	217	1065	72	65	1359	116	54	33	26	130	33	94
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	158	1092	74	478	1670	142	87	53	42	183	47	332
Arrive On Green	0.18	0.65	0.65	0.27	0.51	0.51	0.11	0.11	0.11	0.13	0.13	0.13
Sat Flow, veh/h	1767	3341	226	1767	3286	279	819	500	394	1423	361	1491
Grp Volume(v), veh/h	217	562	575	65	726	749	113	0	0	163	0	94
Grp Sat Flow(s), veh/h/ln	1767	1763	1804	1767	1763	1802	1714	0	0	1784	0	1491
Q Serve(g_s), s	10.7	36.5	36.6	3.3	41.4	41.9	7.6	0.0	0.0	10.5	0.0	6.3
Cycle Q Clear(g_c), s	10.7	36.5	36.6	3.3	41.4	41.9	7.6	0.0	0.0	10.5	0.0	6.3
Prop In Lane	1.00		0.13	1.00		0.15	0.48		0.23	0.80		1.00
Lane Grp Cap(c), veh/h	158	576	590	478	896	916	182	0	0	230	0	332
V/C Ratio(X)	1.38	0.97	0.98	0.14	0.81	0.82	0.62	0.00	0.00	0.71	0.00	0.28
Avail Cap(c_a), veh/h	158	623	637	478	896	916	357	0	0	387	0	463
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.78	0.78	0.78	0.65	0.65	0.65	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	49.3	20.3	20.3	33.1	24.7	24.8	51.3	0.0	0.0	50.1	0.0	39.2
Incr Delay (d2), s/veh	197.6	27.5	27.3	0.0	5.3	5.4	1.3	0.0	0.0	1.5	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	11.9	12.2	1.4	17.5	18.1	3.3	0.0	0.0	4.7	0.0	2.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	246.9	47.9	47.7	33.2	30.0	30.2	52.6	0.0	0.0	51.6	0.0	39.3
LnGrp LOS	F	D	D	C	C	C	D	A	A	D	A	D
Approach Vol, veh/h	1354			1540			113			257		
Approach Delay, s/veh	79.7			30.2			52.6			47.1		
Approach LOS	E			C			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	37.8	44.5		20.4	16.0	66.3		17.3				
Change Period (Y+Rc), s	5.3	5.3		4.9	5.3	5.3		4.6				
Max Green Setting (Gmax), s	6.5	42.4		26.0	10.7	38.2		25.0				
Max Q Clear Time (g_c+1/3), s	15.3	38.6		12.5	12.7	43.9		9.6				
Green Ext Time (p_c), s	0.0	0.6		0.1	0.0	0.0		0.1				
Intersection Summary												
HCM 6th Ctrl Delay	52.8											
HCM 6th LOS	D											

HCM 6th Signalized Intersection Summary

9: Range Ave & Guerneville Rd

Lance Drive Residential TIA
Cumulative PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	180	690	240	100	850	20	330	190	170	100	270	290
Future Volume (veh/h)	180	690	240	100	850	20	330	190	170	100	270	290
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	188	719	0	104	885	0	215	379	102	104	281	130
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	435	1554		128	941		313	497	132	246	324	145
Arrive On Green	0.49	0.88	0.00	0.07	0.27	0.00	0.18	0.18	0.18	0.05	0.05	0.05
Sat Flow, veh/h	1767	3618	0	1767	3618	0	1767	2810	746	1767	2331	1042
Grp Volume(v), veh/h	188	719	0	104	885	0	215	248	233	104	210	201
Grp Sat Flow(s),veh/h/ln	1767	1763	0	1767	1763	0	1767	1856	1700	1767	1763	1610
Q Serve(g_s), s	8.2	4.9	0.0	7.0	29.5	0.0	13.7	15.3	15.7	6.9	14.2	14.9
Cycle Q Clear(g_c), s	8.2	4.9	0.0	7.0	29.5	0.0	13.7	15.3	15.7	6.9	14.2	14.9
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.44	1.00		0.65
Lane Grp Cap(c), veh/h	435	1554		128	941		313	328	301	246	245	224
V/C Ratio(X)	0.43	0.46		0.81	0.94		0.69	0.76	0.77	0.42	0.86	0.90
Avail Cap(c_a), veh/h	435	1554		143	1002		486	510	467	246	245	224
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	0.72	0.72	0.00	0.90	0.90	0.00	1.00	1.00	1.00	0.54	0.54	0.54
Uniform Delay (d), s/veh	25.0	4.3	0.0	54.9	43.1	0.0	46.3	46.9	47.1	52.6	56.1	56.4
Incr Delay (d2), s/veh	0.2	0.7	0.0	21.9	14.1	0.0	1.0	1.3	1.6	0.2	14.3	20.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	1.4	0.0	3.9	14.4	0.0	6.1	7.2	6.7	3.1	7.7	7.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.2	5.0	0.0	76.7	57.2	0.0	47.3	48.3	48.7	52.8	70.3	77.3
LnGrp LOS	C	A		E	E		D	D	D	D	E	E
Approach Vol, veh/h	907		A	989		A	696			515		
Approach Delay, s/veh	9.2			59.2			48.1			69.5		
Approach LOS	A			E			D			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.0	58.2		22.0	34.8	37.3		25.8				
Change Period (Y+Rc), s	5.3	5.3		5.3	5.3	5.3		4.6				
Max Green Setting (Gmax), s	40.1	40.1		16.7	15.7	34.1		33.0				
Max Q Clear Time (g_c+1.9, s)	6.9	6.9		16.9	10.2	31.5		17.7				
Green Ext Time (p_c), s	0.0	0.9		0.0	0.0	0.5		0.4				

Intersection Summary

HCM 6th Ctrl Delay 43.8

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary 10: Guerneville Rd & Steele Wy

Lance Drive Residential TIA
Cumulative PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	820	120	160	860	10	80	50	190	380	60	30
Future Volume (veh/h)	20	820	120	160	860	10	80	50	190	380	60	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	20	837	95	163	878	10	66	73	102	432	0	19
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	594	1889	978	218	939	11	165	174	244	517	0	752
Arrive On Green	0.34	0.54	0.54	0.06	0.26	0.26	0.09	0.09	0.09	0.15	0.00	0.15
Sat Flow, veh/h	1767	3526	1550	3428	3570	41	1767	1856	1537	3534	0	1529
Grp Volume(v), veh/h	20	837	95	163	434	454	66	73	102	432	0	19
Grp Sat Flow(s), veh/h/ln	1767	1763	1550	1714	1763	1848	1767	1856	1537	1767	0	1529
Q Serve(g_s), s	0.9	17.3	2.9	5.6	28.8	28.8	4.2	4.5	7.2	14.3	0.0	0.0
Cycle Q Clear(g_c), s	0.9	17.3	2.9	5.6	28.8	28.8	4.2	4.5	7.2	14.3	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.02	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	594	1889	978	218	464	486	165	174	244	517	0	752
V/C Ratio(X)	0.03	0.44	0.10	0.75	0.93	0.93	0.40	0.42	0.42	0.84	0.00	0.03
Avail Cap(c_a), veh/h	594	1889	978	271	580	608	398	417	446	798	0	874
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.74	0.74	0.74	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	26.7	16.9	8.8	55.3	43.2	43.2	51.2	51.3	45.7	49.8	0.0	16.3
Incr Delay (d2), s/veh	0.0	0.6	0.1	6.2	18.3	17.7	0.6	0.6	0.4	2.7	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	6.9	1.3	2.6	14.7	15.3	1.9	2.1	2.8	6.5	0.0	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.7	17.5	8.9	61.5	61.5	60.9	51.8	51.9	46.1	52.5	0.0	16.3
LnGrp LOS	C	B	A	E	E	E	D	D	D	D	A	B
Approach Vol, veh/h	952			1051			241			451		
Approach Delay, s/veh	16.8			61.3			49.4			51.0		
Approach LOS	B			E			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	2.5	69.2		22.4	45.3	36.5		15.8				
Change Period (Y+Rc), s	4.9	4.9		4.9	4.9	4.9		4.6				
Max Green Setting (Gmax), s	2.5	37.1		27.1	7.1	39.5		27.0				
Max Q Clear Time (g_c+11), s	1.6	19.3		16.3	2.9	30.8		9.2				
Green Ext Time (p_c), s	0.0	1.1		0.1	0.0	0.7		0.1				

Intersection Summary

HCM 6th Ctrl Delay 42.8

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

11: Cleveland Ave & Guerneville Rd

Lance Drive Residential TIA
Cumulative PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	RT	LT	RT	RT	LT	RT	RT	LT	RT	RT	LT	RT
Traffic Volume (veh/h)	140	1180	90	370	1360	240	110	160	280	490	410	140
Future Volume (veh/h)	140	1180	90	370	1360	240	110	160	280	490	410	140
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.98	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	146	1229	86	385	1417	184	115	167	98	355	644	127
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	199	1559	109	437	1384	604	272	334	184	410	696	137
Arrive On Green	0.06	0.32	0.32	0.13	0.39	0.39	0.15	0.15	0.15	0.23	0.23	0.23
Sat Flow, veh/h	3428	4824	337	3428	3526	1540	1767	2169	1199	1767	2995	590
Grp Volume(v), veh/h	146	860	455	385	1417	184	115	134	131	355	399	372
Grp Sat Flow(s), veh/h/ln	1714	1689	1784	1714	1763	1540	1767	1763	1606	1767	1856	1729
Q Serve(g_s), s	5.0	27.8	27.8	13.2	47.1	9.9	7.1	8.3	9.0	23.2	25.2	25.3
Cycle Q Clear(g_c), s	5.0	27.8	27.8	13.2	47.1	9.9	7.1	8.3	9.0	23.2	25.2	25.3
Prop In Lane	1.00		0.19	1.00		1.00	1.00		0.75	1.00		0.34
Lane Grp Cap(c), veh/h	199	1091	577	437	1384	604	272	271	247	410	431	402
V/C Ratio(X)	0.73	0.79	0.79	0.88	1.02	0.30	0.42	0.49	0.53	0.86	0.92	0.93
Avail Cap(c_a), veh/h	203	1091	577	717	1384	604	272	271	247	546	574	535
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.47	0.47	0.47	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	55.6	36.9	36.9	51.5	36.5	25.1	46.0	46.5	46.8	44.3	45.0	45.1
Incr Delay (d2), s/veh	11.0	3.6	6.7	2.0	23.0	0.0	4.8	6.3	8.0	8.7	15.4	16.7
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	11.8	12.9	5.8	23.9	3.6	3.5	4.1	4.2	11.0	13.3	12.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	66.6	40.5	43.5	53.5	59.5	25.2	50.7	52.8	54.8	53.0	60.5	61.8
LnGrp LOS	E	D	D	D	F	C	D	D	D	D	E	E
Approach Vol, veh/h	1461			1986			380			1126		
Approach Delay, s/veh	44.1			55.1			52.8			58.6		
Approach LOS	D			E			D			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	30.2	43.7		23.4	11.9	52.0		32.8				
Change Period (Y+Rc), s	4.9	4.9		4.9	4.9	4.9		4.9				
Max Green Setting (Gmax), s	25.5	29.1		9.1	7.1	47.1		37.1				
Max Q Clear Time (g_c+I1), s	11.5	29.8		11.0	7.0	49.1		27.3				
Green Ext Time (p_c), s	0.1	0.0		0.0	0.0	0.0		0.6				

Intersection Summary

HCM 6th Ctrl Delay 52.5

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

12: US 101 SB Ramps & Guerneville Rd

Lance Drive Residential TIA
Cumulative PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑					↑	↑	↑
Traffic Volume (veh/h)	0	1330	650	350	1620	0	0	0	0	350	80	360
Future Volume (veh/h)	0	1330	650	350	1620	0	0	0	0	350	80	360
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1856	1856	1856	1856	0				1856	1856	1856
Adj Flow Rate, veh/h	0	1371	279	361	1670	0				420	0	337
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	1686	506	413	1742	0				1508	0	671
Arrive On Green	0.00	0.33	0.33	0.12	0.49	0.00				0.43	0.00	0.43
Sat Flow, veh/h	0	5233	1520	3428	3618	0				3534	0	1572
Grp Volume(v), veh/h	0	1371	279	361	1670	0				420	0	337
Grp Sat Flow(s),veh/h/ln	0	1689	1520	1714	1763	0				1767	0	1572
Q Serve(g_s), s	0.0	29.7	18.0	12.4	54.6	0.0				9.3	0.0	18.8
Cycle Q Clear(g_c), s	0.0	29.7	18.0	12.4	54.6	0.0				9.3	0.0	18.8
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1686	506	413	1742	0				1508	0	671
V/C Ratio(X)	0.00	0.81	0.55	0.87	0.96	0.00				0.28	0.00	0.50
Avail Cap(c_a), veh/h	0	1988	597	546	2089	0				1508	0	671
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.40	0.40	0.56	0.56	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	36.6	32.7	51.9	29.2	0.0				22.4	0.0	25.1
Incr Delay (d2), s/veh	0.0	0.8	0.1	5.8	6.3	0.0				0.5	0.0	2.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	12.1	6.6	5.6	23.4	0.0				3.8	0.0	7.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	37.4	32.9	57.7	35.5	0.0				22.8	0.0	27.8
LnGrp LOS	A	D	C	E	D	A				C	A	C
Approach Vol, veh/h		1650			2031						757	
Approach Delay, s/veh		36.6			39.4						25.0	
Approach LOS		D			D						C	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	9.4	44.8		55.8		64.2						
Change Period (Y+Rc), s	4.9	4.9		4.6		4.9						
Max Green Setting (Gmax), s	9.4	47.1		39.4		71.1						
Max Q Clear Time (g_c+I1), s	14.4	31.7		20.8		56.6						
Green Ext Time (p_c), s	0.0	2.0		0.1		2.7						

Intersection Summary

HCM 6th Ctrl Delay 35.9
HCM 6th LOS D

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 13: US 101 NB Ramps & Guerneville Rd/Steele Ln

Lance Drive Residential TIA
Cumulative PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↑↑			↑↑↑		↰	↰↱	↰			
Traffic Volume (veh/h)	460	1220	0	0	1180	280	790	10	400	0	0	0
Future Volume (veh/h)	460	1220	0	0	1180	280	790	10	400	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1856	1856	0	0	1856	1856	1856	1856	1856			
Adj Flow Rate, veh/h	479	1271	0	0	1229	265	936	0	236			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	3	3	0	0	3	3	3	3	3			
Cap, veh/h	981	2267	0	0	1312	283	982	0	437			
Arrive On Green	0.57	1.00	0.00	0.00	0.32	0.32	0.28	0.00	0.28			
Sat Flow, veh/h	3428	3618	0	0	4320	895	3534	0	1572			
Grp Volume(v), veh/h	479	1271	0	0	999	495	936	0	236			
Grp Sat Flow(s),veh/h/ln	1714	1763	0	0	1689	1671	1767	0	1572			
Q Serve(g_s), s	10.0	0.0	0.0	0.0	34.5	34.5	31.2	0.0	15.3			
Cycle Q Clear(g_c), s	10.0	0.0	0.0	0.0	34.5	34.5	31.2	0.0	15.3			
Prop In Lane	1.00		0.00	0.00		0.54	1.00		1.00			
Lane Grp Cap(c), veh/h	981	2267	0	0	1067	528	982	0	437			
V/C Ratio(X)	0.49	0.56	0.00	0.00	0.94	0.94	0.95	0.00	0.54			
Avail Cap(c_a), veh/h	981	2267	0	0	1174	581	1249	0	556			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.70	0.70	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	20.4	0.0	0.0	0.0	39.9	39.9	42.6	0.0	36.8			
Incr Delay (d2), s/veh	0.1	0.7	0.0	0.0	12.6	21.1	12.5	0.0	0.4			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	3.3	0.2	0.0	0.0	15.8	16.9	14.8	0.0	5.7			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.5	0.7	0.0	0.0	52.5	61.0	55.1	0.0	37.2			
LnGrp LOS	C	A	A	A	D	E	E	A	D			
Approach Vol, veh/h	1750			1494			1172					
Approach Delay, s/veh	6.1			55.3			51.5					
Approach LOS	A			E			D					
Timer - Assigned Phs	2			5			6			8		
Phs Duration (G+Y+Rc), s	82.0			39.2			42.8			38.0		
Change Period (Y+Rc), s	4.9			4.9			4.9			4.6		
Max Green Setting (Gmax), s	68.1			21.5			41.7			42.4		
Max Q Clear Time (g_c+I1), s	2.0			12.0			36.5			33.2		
Green Ext Time (p_c), s	1.9			0.1			1.4			0.1		

Intersection Summary

HCM 6th Ctrl Delay	34.8
HCM 6th LOS	C

Notes










User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

14: Stony Point Rd/Marlow Rd & W College Ave

Lance Drive Residential TIA
Cumulative PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	290	130	260	400	230	190	890	300	190	970	120
Future Volume (veh/h)	80	290	130	260	400	230	190	890	300	190	970	120
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No				No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	84	305	97	274	421	176	200	937	193	200	1021	117
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	270	369	115	352	452	187	229	1088	790	310	1127	129
Arrive On Green	0.15	0.14	0.14	0.20	0.19	0.19	0.13	0.31	0.31	0.18	0.35	0.35
Sat Flow, veh/h	1767	2632	820	1767	2419	1000	1767	3526	1545	1767	3181	364
Grp Volume(v), veh/h	84	202	200	274	305	292	200	937	193	200	565	573
Grp Sat Flow(s),veh/h/ln	1767	1763	1689	1767	1763	1656	1767	1763	1545	1767	1763	1783
Q Serve(g_s), s	5.1	13.4	13.8	17.6	20.5	20.9	13.3	30.0	3.2	12.6	36.6	36.7
Cycle Q Clear(g_c), s	5.1	13.4	13.8	17.6	20.5	20.9	13.3	30.0	3.2	12.6	36.6	36.7
Prop In Lane	1.00		0.49	1.00		0.60	1.00		1.00	1.00		0.20
Lane Grp Cap(c), veh/h	270	247	237	352	329	309	229	1088	790	310	624	631
V/C Ratio(X)	0.31	0.82	0.84	0.78	0.93	0.94	0.87	0.86	0.24	0.65	0.91	0.91
Avail Cap(c_a), veh/h	270	289	277	352	329	309	305	1254	863	349	671	679
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.30	0.30	0.30	1.00	1.00	1.00	0.36	0.36	0.36
Uniform Delay (d), s/veh	45.2	50.1	50.3	45.5	48.0	48.2	51.3	39.1	5.6	46.0	36.9	36.9
Incr Delay (d2), s/veh	0.6	14.6	18.3	3.4	13.3	16.2	18.8	5.7	0.2	1.3	6.5	6.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	6.8	6.9	7.9	10.0	9.8	7.0	13.4	1.2	5.6	16.3	16.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.8	64.7	68.5	48.9	61.3	64.4	70.0	44.8	5.8	47.3	43.4	43.4
LnGrp LOS	D	E	E	D	E	E	E	D	A	D	D	D
Approach Vol, veh/h	486		871				1330			1338		
Approach Delay, s/veh	63.0		58.4				42.9			44.0		
Approach LOS	E		E				D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	29.2	22.1	20.9	47.8	23.7	27.7	26.3	42.3				
Change Period (Y+Rc), s	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3				
Max Green Setting (Gmax), s	29.2	19.7	20.7	45.7	12.7	19.7	23.7	42.7				
Max Q Clear Time (g_c+I1), s	19.6	15.8	15.3	38.7	7.1	22.9	14.6	32.0				
Green Ext Time (p_c), s	0.0	0.8	0.2	3.8	0.1	0.0	0.3	5.0				

Intersection Summary

HCM 6th Ctrl Delay 49.0
HCM 6th LOS D









Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary 15: N Dutton Ave & W College Ave

Lance Drive Residential TIA
Cumulative PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	670	120	220	900	190	170	380	150	350	580	160
Future Volume (veh/h)	100	670	120	220	900	190	170	380	150	350	580	160
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	104	698	113	229	938	183	177	396	121	365	604	141
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	128	751	122	275	993	194	314	458	138	533	837	195
Arrive On Green	0.07	0.25	0.25	0.16	0.34	0.34	0.18	0.17	0.17	0.30	0.30	0.30
Sat Flow, veh/h	1767	3030	490	1767	2933	572	1767	2654	801	1767	2827	658
Grp Volume(v), veh/h	104	406	405	229	563	558	177	261	256	365	376	369
Grp Sat Flow(s),veh/h/ln	1767	1763	1758	1767	1763	1742	1767	1763	1692	1767	1763	1723
Q Serve(g_s), s	7.0	27.0	27.0	15.1	37.3	37.4	11.0	17.3	17.7	21.8	22.9	23.0
Cycle Q Clear(g_c), s	7.0	27.0	27.0	15.1	37.3	37.4	11.0	17.3	17.7	21.8	22.9	23.0
Prop In Lane	1.00		0.28	1.00		0.33	1.00		0.47	1.00		0.38
Lane Grp Cap(c), veh/h	128	437	436	275	597	590	314	304	292	533	522	510
V/C Ratio(X)	0.81	0.93	0.93	0.83	0.94	0.95	0.56	0.86	0.88	0.69	0.72	0.72
Avail Cap(c_a), veh/h	133	472	470	297	636	629	314	439	422	533	660	645
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.75	0.75	0.75	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.9	44.1	44.1	49.2	38.6	38.6	45.1	48.2	48.4	36.9	37.8	37.8
Incr Delay (d2), s/veh	22.0	18.8	19.1	15.6	21.6	22.1	1.4	8.1	10.1	3.0	1.8	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	13.9	13.9	7.8	19.3	19.1	4.9	8.2	8.2	9.6	9.9	9.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	76.9	62.9	63.2	64.8	60.2	60.7	46.5	56.3	58.5	39.9	39.6	39.8
LnGrp LOS	E	E	E	E	E	E	D	E	E	D	D	D
Approach Vol, veh/h	915			1350			694			1110		
Approach Delay, s/veh	64.6			61.2			54.6			39.8		
Approach LOS	E			E			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	22.6	33.7	24.3	39.4	11.7	44.5	39.2	24.6				
Change Period (Y+Rc), s	3.9	* 3.9	3.0	3.9	3.0	3.9	3.0	3.9				
Max Green Setting (Gmax), s	20.8	* 32	9.0	44.9	9.0	43.3	24.0	29.9				
Max Q Clear Time (g_c+I1), s	29.0	29.0	13.0	25.0	9.0	39.4	23.8	19.7				
Green Ext Time (p_c), s	0.0	0.7	0.0	1.4	0.0	1.3	0.0	0.9				

Intersection Summary

HCM 6th Ctrl Delay 55.0

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection

Intersection Delay, s/veh 7.4

Intersection LOS A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	0	0	0	0	0	90	0	0	0	80	0	0
Future Vol, veh/h	0	0	0	0	0	90	0	0	0	80	0	0
Peak Hour Factor	0.86	0.86	0.92	0.92	0.86	0.86	0.92	0.92	0.92	0.86	0.92	0.86
Heavy Vehicles, %	3	3	2	2	3	3	2	2	2	3	2	3
Mvmt Flow	0	0	0	0	0	105	0	0	0	93	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0























Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	0	7	0	7.9
HCM LOS	-	A	-	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	0%	0%	100%
Vol Thru, %	100%	100%	0%	0%
Vol Right, %	0%	0%	100%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	0	0	90	80
LT Vol	0	0	0	80
Through Vol	0	0	0	0
RT Vol	0	0	90	0
Lane Flow Rate	0	0	105	93
Geometry Grp	1	1	1	1
Degree of Util (X)	0	0	0.102	0.112
Departure Headway (Hd)	4.19	4.196	3.513	4.334
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	0	0	1010	829
Service Time	2.233	2.262	1.57	2.352
HCM Lane V/C Ratio	0	0	0.104	0.112
HCM Control Delay	7.2	7.3	7	7.9
HCM Lane LOS	N	N	A	A
HCM 95th-tile Q	0	0	0.3	0.4

HCM 6th Signalized Intersection Summary







1: Marlow Rd & Marlow Ct/W Steele Ln

Lance Drive Residential TIA
Cumulative PM (120-140 Seconds)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	0	10	200	10	170	10	750	200	130	850	10
Future Volume (veh/h)	10	0	10	200	10	170	10	750	200	130	850	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	11	0	0	219	0	110	11	789	150	137	895	10
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	64	0	0	1705	0	900	22	897	1145	161	1190	13
Arrive On Green	0.04	0.00	0.00	0.48	0.00	0.48	0.01	0.25	0.25	0.09	0.33	0.33
Sat Flow, veh/h	1767	0	0	3534	0	1568	1767	3526	1519	1767	3570	40
Grp Volume(v), veh/h	11	0	0	219	0	110	11	789	150	137	442	463
Grp Sat Flow(s),veh/h/ln	1767	0	0	1767	0	1568	1767	1763	1519	1767	1763	1848
Q Serve(g_s), s	0.8	0.0	0.0	4.8	0.0	0.0	0.9	30.1	4.0	10.7	31.2	31.2
Cycle Q Clear(g_c), s	0.8	0.0	0.0	4.8	0.0	0.0	0.9	30.1	4.0	10.7	31.2	31.2
Prop In Lane	1.00		0.00	1.00		1.00	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	64	0	0	1705	0	900	22	897	1145	161	588	616
V/C Ratio(X)	0.17	0.00	0.00	0.13	0.00	0.12	0.50	0.88	0.13	0.85	0.75	0.75
Avail Cap(c_a), veh/h	379	0	0	1705	0	900	64	1010	1194	228	669	701
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.62	0.62	0.62	1.00	1.00	1.00
Uniform Delay (d), s/veh	65.5	0.0	0.0	20.0	0.0	13.7	68.7	50.1	5.4	62.7	41.5	41.5
Incr Delay (d2), s/veh	1.3	0.0	0.0	0.2	0.0	0.3	10.5	5.4	0.0	18.5	4.2	4.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	2.1	0.0	1.7	0.5	13.8	4.3	5.6	14.1	14.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	66.7	0.0	0.0	20.1	0.0	14.0	79.2	55.5	5.4	81.1	45.7	45.5
LnGrp LOS	E	A	A	C	A	B	E	E	A	F	D	D
Approach Vol, veh/h		11			329			950			1042	
Approach Delay, s/veh		66.7			18.1			47.9			50.3	
Approach LOS		E			B			D			D	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		72.2	6.6	51.6		9.6	17.7	40.5				
Change Period (Y+Rc), s		4.6	4.9	4.9		4.6	4.9	4.9				
Max Green Setting (Gmax), s		32.8	5.1	53.1		30.0	18.1	40.1				
Max Q Clear Time (g_c+I1), s		6.8	2.9	33.2		2.8	12.7	32.1				
Green Ext Time (p_c), s		1.1	0.0	5.6		0.0	0.1	3.5				
Intersection Summary												
HCM 6th Ctrl Delay				44.8								
HCM 6th LOS				D								
Notes												
User approved pedestrian interval to be less than phase max green.												
User approved volume balancing among the lanes for turning movement.												

HCM 6th TWSC
2: Iroquois St/Apple Valley Ln & W Steele Ln

Lance Drive Residential TIA
Cumulative PM (120-140 Seconds)

Intersection												
Int Delay, s/veh	6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	30	340	50	50	530	50	50	10	30	30	20	30
Future Vol, veh/h	30	340	50	50	530	50	50	10	30	30	20	30
Conflicting Peds, #/hr	9	0	9	9	0	9	1	0	2	2	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	60	-	-	80	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	32	358	53	53	558	53	53	11	32	32	21	32






















Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	620	0	0	420	0	0	1176	1184	396	1172	1184	595
Stage 1	-	-	-	-	-	-	458	458	-	700	700	-
Stage 2	-	-	-	-	-	-	718	726	-	472	484	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	956	-	-	1134	-	-	167	188	651	168	188	502
Stage 1	-	-	-	-	-	-	581	565	-	428	440	-
Stage 2	-	-	-	-	-	-	419	428	-	571	550	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	948	-	-	1124	-	-	132	170	644	142	170	497
Mov Cap-2 Maneuver	-	-	-	-	-	-	132	170	-	142	170	-
Stage 1	-	-	-	-	-	-	557	541	-	410	415	-
Stage 2	-	-	-	-	-	-	355	404	-	513	526	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.6			0.7			42.9			34.1		
HCM LOS							E			D		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	186	948	-	-	1124	-	-	206
HCM Lane V/C Ratio	0.509	0.033	-	-	0.047	-	-	0.409
HCM Control Delay (s)	42.9	8.9	-	-	8.4	-	-	34.1
HCM Lane LOS	E	A	-	-	A	-	-	D
HCM 95th %tile Q(veh)	2.5	0.1	-	-	0.1	-	-	1.9

HCM 6th Signalized Intersection Summary 3: Range Ave & W Steele Ln

Lance Drive Residential TIA
Cumulative PM (120-140 Seconds)











												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	370	80	70	500	60	100	240	50	70	510	60
Future Volume (veh/h)	50	370	80	70	500	60	100	240	50	70	510	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.96	1.00		0.93
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	52	385	4	73	521	43	104	250	10	73	531	55
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	490	1227	13	625	1131	93	126	434	17	218	590	61
Arrive On Green	0.67	0.67	0.67	0.67	0.67	0.67	0.07	0.13	0.13	0.12	0.18	0.18
Sat Flow, veh/h	840	1833	19	986	1690	139	1767	3449	137	1767	3199	330
Grp Volume(v), veh/h	52	0	389	73	0	564	104	127	133	73	292	294
Grp Sat Flow(s),veh/h/ln	840	0	1852	986	0	1830	1767	1763	1824	1767	1763	1766
Q Serve(g_s), s	4.4	0.0	12.3	4.7	0.0	20.6	8.1	9.5	9.6	5.3	22.6	22.8
Cycle Q Clear(g_c), s	25.0	0.0	12.3	17.0	0.0	20.6	8.1	9.5	9.6	5.3	22.6	22.8
Prop In Lane	1.00		0.01	1.00		0.08	1.00		0.08	1.00		0.19
Lane Grp Cap(c), veh/h	490	0	1240	625	0	1225	126	222	230	218	325	326
V/C Ratio(X)	0.11	0.00	0.31	0.12	0.00	0.46	0.83	0.57	0.58	0.34	0.90	0.90
Avail Cap(c_a), veh/h	490	0	1240	625	0	1225	215	517	535	218	480	481
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.47	0.47	0.47	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.0	0.0	9.7	13.2	0.0	11.1	64.2	57.6	57.7	56.1	55.8	55.9
Incr Delay (d2), s/veh	0.4	0.0	0.7	0.4	0.0	1.2	2.5	0.4	0.4	0.3	10.9	11.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	5.0	1.1	0.0	8.4	3.7	4.2	4.4	2.4	10.9	11.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.5	0.0	10.3	13.6	0.0	12.3	66.6	58.0	58.1	56.5	66.7	67.7
LnGrp LOS	B	A	B	B	A	B	E	E	E	E	E	E
Approach Vol, veh/h		441			637			364			659	
Approach Delay, s/veh		11.2			12.5			60.5			66.0	
Approach LOS		B			B			E			E	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		97.3	13.0	29.7		97.3	21.1	21.5				
Change Period (Y+Rc), s		3.6	3.0	3.9		3.6	3.9	* 3.9				
Max Green Setting (Gmax), s		74.4	17.0	38.1		74.4	14.0	* 41				
Max Q Clear Time (g_c+I1), s		27.0	10.1	24.8		22.6	7.3	11.6				
Green Ext Time (p_c), s		0.9	0.0	1.0		1.3	0.0	0.4				
Intersection Summary												
HCM 6th Ctrl Delay			37.3									
HCM 6th LOS			D									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

HCM 6th Signalized Intersection Summary

4: Marlow Rd & Guerneville Rd

Lance Drive Residential TIA
Cumulative PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	200	480	150	310	540	140	160	720	190	80	840	90
Future Volume (veh/h)	200	480	150	310	540	140	160	720	190	80	840	90
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No				No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	211	505	101	326	568	127	168	758	120	84	884	89
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	239	638	444	349	703	157	187	891	699	249	929	93
Arrive On Green	0.14	0.18	0.18	0.20	0.25	0.25	0.11	0.25	0.25	0.14	0.29	0.29
Sat Flow, veh/h	1767	3526	1536	1767	2852	635	1767	3526	1539	1767	3228	325
Grp Volume(v), veh/h	211	505	101	326	350	345	168	758	120	84	483	490
Grp Sat Flow(s),veh/h/ln	1767	1763	1536	1767	1763	1724	1767	1763	1539	1767	1763	1790
Q Serve(g_s), s	14.1	16.4	2.8	21.8	22.4	22.6	11.3	24.6	0.0	5.1	32.2	32.2
Cycle Q Clear(g_c), s	14.1	16.4	2.8	21.8	22.4	22.6	11.3	24.6	0.0	5.1	32.2	32.2
Prop In Lane	1.00		1.00	1.00		0.37	1.00		1.00	1.00		0.18
Lane Grp Cap(c), veh/h	239	638	444	349	435	425	187	891	699	249	507	515
V/C Ratio(X)	0.88	0.79	0.23	0.93	0.81	0.81	0.90	0.85	0.17	0.34	0.95	0.95
Avail Cap(c_a), veh/h	280	802	516	349	470	460	187	1072	779	249	510	518
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.95	0.95	0.95	0.43	0.43	0.43	0.74	0.74	0.74
Uniform Delay (d), s/veh	51.0	47.0	10.9	47.4	42.5	42.6	53.0	42.7	19.6	46.5	41.9	41.9
Incr Delay (d2), s/veh	24.1	4.3	0.3	30.6	14.0	14.7	21.0	2.6	0.0	0.6	23.1	22.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.7	7.4	1.3	12.3	11.2	11.1	6.0	10.7	2.0	2.3	17.0	17.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	75.0	51.3	11.2	78.0	56.5	57.2	74.1	45.3	19.7	47.1	65.0	64.8
LnGrp LOS	E	D	B	E	E	E	E	D	B	D	E	E
Approach Vol, veh/h	817		1021				1046			1057		
Approach Delay, s/veh	52.5		63.6				47.0			63.5		
Approach LOS	D		E				D			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	29.4	27.4	18.0	39.8	21.5	35.3	22.2	35.6				
Change Period (Y+Rc), s	5.7	* 5.7	5.3	5.3	5.3	5.7	5.3	5.3				
Max Green Setting (Gmax), s	27.3	* 27	12.7	34.7	19.0	32.0	10.9	36.5				
Max Q Clear Time (g_c+23.8), s	23.8	18.4	13.3	34.2	16.1	24.6	7.1	26.6				
Green Ext Time (p_c), s	0.0	2.3	0.0	0.3	0.2	2.4	0.0	3.8				

Intersection Summary

HCM 6th Ctrl Delay 56.8

HCM 6th LOS E

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary 5: Ridley Ave & Guerneville Rd

Lance Drive Residential TIA
Cumulative PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	740	40	80	940	20	20	10	50	20	10	20
Future Volume (veh/h)	20	740	40	80	940	20	20	10	50	20	10	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	0.99		0.98	0.99		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No		No				No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	22	796	42	86	1011	22	22	11	3	22	11	0
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	541	3081	163	621	3189	69	80	31	6	85	34	0
Arrive On Green	0.90	0.90	0.90	1.00	1.00	1.00	0.05	0.05	0.05	0.05	0.05	0.00
Sat Flow, veh/h	541	3406	180	650	3526	77	828	663	136	909	731	0
Grp Volume(v), veh/h	22	412	426	86	505	528	36	0	0	33	0	0
Grp Sat Flow(s),veh/h/ln	541	1763	1823	650	1763	1840	1626	0	0	1640	0	0
Q Serve(g_s), s	0.6	4.1	4.1	0.7	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.6	4.1	4.1	4.8	0.0	0.0	2.8	0.0	0.0	2.5	0.0	0.0
Prop In Lane	1.00		0.10	1.00		0.04	0.61		0.08	0.67		0.00
Lane Grp Cap(c), veh/h	541	1595	1649	621	1595	1664	116	0	0	119	0	0
V/C Ratio(X)	0.04	0.26	0.26	0.14	0.32	0.32	0.31	0.00	0.00	0.28	0.00	0.00
Avail Cap(c_a), veh/h	541	1595	1649	621	1595	1664	425	0	0	426	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.83	0.83	0.83	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.7	0.8	0.8	0.1	0.0	0.0	65.0	0.0	0.0	64.9	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.3	0.3	0.0	0.0	0.0	0.6	0.0	0.0	0.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.3	0.3	0.0	0.0	0.0	1.3	0.0	0.0	1.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.8	1.2	1.1	0.1	0.0	0.0	65.5	0.0	0.0	65.3	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	E	A	A	E	A	A
Approach Vol, veh/h	860				1119		36				33	
Approach Delay, s/veh	1.1				0.0		65.5				65.3	
Approach LOS	A				A		E				E	
Timer - Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	130.5		9.5		130.5		9.5					
Change Period (Y+Rc), s	3.9		3.0		3.9		3.0					
Max Green Setting (Gmax), s	98.1		35.0		98.1		35.0					
Max Q Clear Time (g_c+I1), s	6.1		4.5		6.8		4.8					
Green Ext Time (p_c), s	1.7		0.1		2.4		0.1					

Intersection Summary

HCM 6th Ctrl Delay	2.7
HCM 6th LOS	A

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary 6: Lance Dr & Guerneville Rd

Lance Drive Residential TIA
Cumulative PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	680	20	70	1020	120	10	30	50	60	40	40
Future Volume (veh/h)	60	680	20	70	1020	120	10	30	50	60	40	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	0.99		0.99	0.99		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	62	708	20	73	1062	108	10	31	15	62	42	30
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	78	746	21	259	1112	484	49	124	52	111	65	40
Arrive On Green	0.09	0.43	0.43	0.19	0.42	0.42	0.11	0.11	0.11	0.11	0.11	0.11
Sat Flow, veh/h	1767	3499	99	1767	3526	1536	167	1113	468	656	578	356
Grp Volume(v), veh/h	62	357	371	73	1062	108	56	0	0	134	0	0
Grp Sat Flow(s), veh/h/ln	1767	1763	1835	1767	1763	1536	1748	0	0	1590	0	0
Q Serve(g_s), s	4.8	27.3	27.3	4.9	40.8	6.3	0.0	0.0	0.0	7.1	0.0	0.0
Cycle Q Clear(g_c), s	4.8	27.3	27.3	4.9	40.8	6.3	4.1	0.0	0.0	11.2	0.0	0.0
Prop In Lane	1.00		0.05	1.00		1.00	0.18		0.27	0.46		0.22
Lane Grp Cap(c), veh/h	78	376	392	259	1112	484	226	0	0	215	0	0
V/C Ratio(X)	0.79	0.95	0.95	0.28	0.96	0.22	0.25	0.00	0.00	0.62	0.00	0.00
Avail Cap(c_a), veh/h	211	903	940	259	1806	786	470	0	0	440	0	0
HCM Platoon Ratio	2.00	2.00	2.00	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.89	0.89	0.89	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	63.2	39.4	39.4	50.1	39.7	29.7	57.0	0.0	0.0	60.0	0.0	0.0
Incr Delay (d2), s/veh	6.5	5.6	5.5	0.2	16.8	0.9	0.2	0.0	0.0	1.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	9.9	10.3	2.2	18.6	2.4	1.9	0.0	0.0	4.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	69.7	45.0	44.9	50.3	56.4	30.6	57.2	0.0	0.0	61.1	0.0	0.0
LnGrp LOS	E	D	D	D	E	C	E	A	A	E	A	A
Approach Vol, veh/h	790			1243			56			134		
Approach Delay, s/veh	46.9			53.8			57.2			61.1		
Approach LOS	D			D			E			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	25.8	35.2		20.3	11.5	49.5		20.3				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		4.6				
Max Green Setting (Gmax), s	60.0	71.7		36.4	16.7	71.7		36.4				
Max Q Clear Time (g_c+10), s	10.0	29.3		13.2	6.8	42.8		6.1				
Green Ext Time (p_c), s	0.0	0.6		0.2	0.0	1.3		0.1				

Intersection Summary

HCM 6th Ctrl Delay 51.9
HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

7: N Dutton Ave/Westberry Dr & Guerneville Rd

Lance Drive Residential TIA
Cumulative PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	730	120	530	970	30	180	10	520	10	10	10
Future Volume (veh/h)	10	730	120	530	970	30	180	10	520	10	10	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.99	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	11	785	121	570	1043	31	202	0	208	11	11	1
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	26	828	128	1630	2556	76	250	0	858	31	31	3
Arrive On Green	0.01	0.27	0.27	0.95	1.00	1.00	0.07	0.00	0.07	0.04	0.04	0.04
Sat Flow, veh/h	1767	3051	470	3428	3493	104	3534	0	1559	859	859	78
Grp Volume(v), veh/h	11	453	453	570	526	548	202	0	208	23	0	0
Grp Sat Flow(s), veh/h/ln	1767	1763	1759	1714	1763	1834	1767	0	1559	1796	0	0
Q Serve(g_s), s	0.9	35.3	35.3	1.7	0.0	0.0	7.9	0.0	0.0	1.8	0.0	0.0
Cycle Q Clear(g_c), s	0.9	35.3	35.3	1.7	0.0	0.0	7.9	0.0	0.0	1.8	0.0	0.0
Prop In Lane	1.00		0.27	1.00		0.06	1.00		1.00	0.48		0.04
Lane Grp Cap(c), veh/h	26	478	477	1630	1290	1342	250	0	858	64	0	0
V/C Ratio(X)	0.42	0.95	0.95	0.35	0.41	0.41	0.81	0.00	0.24	0.36	0.00	0.00
Avail Cap(c_a), veh/h	77	559	558	1630	1290	1342	371	0	911	355	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.96	0.96	0.96	0.55	0.55	0.55	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	68.4	50.0	50.0	1.8	0.0	0.0	64.1	0.0	16.6	65.9	0.0	0.0
Incr Delay (d2), s/veh	3.7	29.3	29.3	0.0	0.5	0.5	4.6	0.0	0.1	1.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	19.2	19.1	0.5	0.2	0.2	3.7	0.0	3.4	0.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	72.1	79.3	79.4	1.9	0.5	0.5	68.7	0.0	16.7	67.1	0.0	0.0
LnGrp LOS	E	E	E	A	A	A	E	A	B	E	A	A
Approach Vol, veh/h	917			1644			410			23		
Approach Delay, s/veh	79.3			1.0			42.3			67.1		
Approach LOS	E			A			D			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	1.9	43.3		9.6	7.4	107.8		15.2				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		5.3				
Max Green Setting (Gmax), s	32.3	44.4		27.7	6.1	71.0		14.7				
Max Q Clear Time (g_c+I1), s	13.3	37.3		3.8	2.9	2.0		9.9				
Green Ext Time (p_c), s	0.1	0.6		0.0	0.0	0.9		0.0				

Intersection Summary

HCM 6th Ctrl Delay	31.1
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 8: Herbert St/Coffey Ln & Guerneville Rd

Lance Drive Residential TIA
Cumulative PM (120-140 Seconds)











Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	200	980	70	60	1250	110	50	30	40	120	30	270
Future Volume (veh/h)	200	980	70	60	1250	110	50	30	40	120	30	270
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.99	1.00		0.94	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	217	1065	72	65	1359	116	54	33	26	130	33	94
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	211	1091	74	538	1682	143	83	51	40	175	45	371
Arrive On Green	0.24	0.65	0.65	0.30	0.51	0.51	0.10	0.10	0.10	0.12	0.12	0.12
Sat Flow, veh/h	1767	3341	226	1767	3286	279	818	500	394	1423	361	1488
Grp Volume(v), veh/h	217	562	575	65	726	749	113	0	0	163	0	94
Grp Sat Flow(s), veh/h/ln	1767	1763	1804	1767	1763	1802	1713	0	0	1784	0	1488
Q Serve(g_s), s	16.7	42.7	42.8	3.7	47.9	48.5	8.9	0.0	0.0	12.3	0.0	7.2
Cycle Q Clear(g_c), s	16.7	42.7	42.8	3.7	47.9	48.5	8.9	0.0	0.0	12.3	0.0	7.2
Prop In Lane	1.00		0.13	1.00		0.15	0.48		0.23	0.80		1.00
Lane Grp Cap(c), veh/h	211	576	589	538	902	923	175	0	0	220	0	371
V/C Ratio(X)	1.03	0.98	0.98	0.12	0.81	0.81	0.65	0.00	0.00	0.74	0.00	0.25
Avail Cap(c_a), veh/h	211	742	759	538	902	923	306	0	0	333	0	465
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.78	0.78	0.78	0.66	0.66	0.66	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	53.3	23.8	23.8	35.1	28.4	28.5	60.4	0.0	0.0	59.2	0.0	42.9
Incr Delay (d2), s/veh	62.6	27.7	27.5	0.0	5.1	5.2	1.5	0.0	0.0	1.8	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	15.0	15.3	1.6	20.6	21.4	4.0	0.0	0.0	5.7	0.0	2.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	115.9	51.5	51.3	35.2	33.5	33.7	61.9	0.0	0.0	61.1	0.0	43.0
LnGrp LOS	F	D	D	D	C	C	E	A	A	E	A	D
Approach Vol, veh/h	1354			1540			113			257		
Approach Delay, s/veh	61.7			33.7			61.9			54.5		
Approach LOS	E			C			E			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	47.9	51.0		22.2	22.0	77.0		18.9				
Change Period (Y+Rc), s	5.3	5.3		4.9	5.3	5.3		4.6				
Max Green Setting (Gmax), s	58.9	58.9		26.1	16.7	52.1		25.0				
Max Q Clear Time (g_c+1/5), s	44.8	44.8		14.3	18.7	50.5		10.9				
Green Ext Time (p_c), s	0.0	1.0		0.1	0.0	0.5		0.1				
Intersection Summary												
HCM 6th Ctrl Delay	47.9											
HCM 6th LOS	D											

HCM 6th Signalized Intersection Summary

9: Range Ave & Guerneville Rd

Lance Drive Residential TIA
Cumulative PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	180	690	240	100	850	20	330	190	170	100	270	290
Future Volume (veh/h)	180	690	240	100	850	20	330	190	170	100	270	290
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	188	719	0	104	885	0	215	379	102	104	281	130
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	491	1666		126	937		300	477	127	247	326	146
Arrive On Green	0.56	0.95	0.00	0.07	0.27	0.00	0.17	0.17	0.17	0.05	0.05	0.05
Sat Flow, veh/h	1767	3618	0	1767	3618	0	1767	2809	745	1767	2331	1042
Grp Volume(v), veh/h	188	719	0	104	885	0	215	248	233	104	210	201
Grp Sat Flow(s),veh/h/ln	1767	1763	0	1767	1763	0	1767	1856	1699	1767	1763	1611
Q Serve(g_s), s	8.4	2.6	0.0	8.1	34.5	0.0	16.1	18.0	18.4	8.0	16.6	17.4
Cycle Q Clear(g_c), s	8.4	2.6	0.0	8.1	34.5	0.0	16.1	18.0	18.4	8.0	16.6	17.4
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.44	1.00		0.65
Lane Grp Cap(c), veh/h	491	1666		126	937		300	315	289	247	246	225
V/C Ratio(X)	0.38	0.43		0.83	0.94		0.72	0.79	0.81	0.42	0.85	0.89
Avail Cap(c_a), veh/h	491	1666		170	1030		422	443	405	302	301	275
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	0.71	0.71	0.00	0.90	0.90	0.00	1.00	1.00	1.00	0.52	0.52	0.52
Uniform Delay (d), s/veh	24.3	2.1	0.0	64.2	50.4	0.0	54.9	55.7	55.9	61.3	65.3	65.7
Incr Delay (d2), s/veh	0.1	0.6	0.0	14.7	14.0	0.0	1.5	3.9	5.2	0.2	8.6	13.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	0.8	0.0	4.2	16.9	0.0	7.3	8.8	8.3	3.7	8.5	8.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.4	2.7	0.0	78.8	64.4	0.0	56.4	59.6	61.1	61.5	74.0	79.2
LnGrp LOS	C	A		E	E		E	E	E	E	E	E
Approach Vol, veh/h	907		A	989		A	696		515			
Approach Delay, s/veh	7.2			65.9			59.1		73.5			
Approach LOS	A			E			E		E			
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.3	71.5		24.9	44.2	42.5		28.4				
Change Period (Y+Rc), s	5.3	5.3		5.3	5.3	5.3		4.6				
Max Green Setting (Gmax), s	48.7	48.7		23.9	21.3	40.9		33.4				
Max Q Clear Time (g_c+I10, s)	4.6	4.6		19.4	10.4	36.5		20.4				
Green Ext Time (p_c), s	0.0	0.9		0.2	0.0	0.7		0.4				

Intersection Summary

HCM 6th Ctrl Delay 48.5

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

10: Guerneville Rd & Steele Wy

Lance Drive Residential TIA
Cumulative PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	820	120	160	860	10	80	50	190	380	60	30
Future Volume (veh/h)	20	820	120	160	860	10	80	50	190	380	60	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	20	837	95	163	878	10	66	73	102	432	0	15
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	652	2005	1023	210	932	11	160	168	235	501	0	797
Arrive On Green	0.12	0.19	0.19	0.06	0.26	0.26	0.09	0.09	0.09	0.14	0.00	0.14
Sat Flow, veh/h	1767	3526	1550	3428	3570	41	1767	1856	1536	3534	0	1528
Grp Volume(v), veh/h	20	837	95	163	434	454	66	73	102	432	0	15
Grp Sat Flow(s), veh/h/ln	1767	1763	1550	1714	1763	1848	1767	1856	1536	1767	0	1528
Q Serve(g_s), s	1.4	29.3	5.6	6.6	33.7	33.7	4.9	5.2	8.4	16.7	0.0	0.0
Cycle Q Clear(g_c), s	1.4	29.3	5.6	6.6	33.7	33.7	4.9	5.2	8.4	16.7	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.02	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	652	2005	1023	210	460	482	160	168	235	501	0	797
V/C Ratio(X)	0.03	0.42	0.09	0.78	0.94	0.94	0.41	0.44	0.43	0.86	0.00	0.02
Avail Cap(c_a), veh/h	652	2005	1023	321	656	688	358	376	408	810	0	931
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.76	0.76	0.76	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	39.4	36.4	17.1	64.8	50.7	50.7	60.2	60.3	54.0	58.7	0.0	16.9
Incr Delay (d2), s/veh	0.0	0.5	0.1	2.8	15.1	14.6	0.6	0.7	0.5	3.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	14.0	2.8	2.9	16.7	17.4	2.3	2.5	3.3	7.7	0.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.4	36.9	17.3	67.5	65.8	65.3	60.8	61.0	54.4	61.7	0.0	16.9
LnGrp LOS	D	D	B	E	E	E	E	E	D	E	A	B
Approach Vol, veh/h	952			1051			241			447		
Approach Delay, s/veh	35.0			65.9			58.2			60.2		
Approach LOS	D			E			E			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	3.5	84.5		24.8	56.5	41.4		17.2				
Change Period (Y+Rc), s	4.9	4.9		4.9	4.9	4.9		4.6				
Max Green Setting (Gmax), s	3.5	47.1		32.1	8.1	52.1		28.4				
Max Q Clear Time (g_c+1/3), s	3.5	31.3		18.7	3.4	35.7		10.4				
Green Ext Time (p_c), s	0.0	1.1		0.1	0.0	0.8		0.1				

Intersection Summary

HCM 6th Ctrl Delay 53.3

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

11: Cleveland Ave & Guerneville Rd

Lance Drive Residential TIA
Cumulative PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	RT	LT	RT	RT	LT	RT	RT	LT	RT	RT	LT	RT
Traffic Volume (veh/h)	140	1180	90	370	1360	240	110	160	280	490	410	140
Future Volume (veh/h)	140	1180	90	370	1360	240	110	160	280	490	410	140
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	146	1229	86	385	1417	184	115	167	98	355	644	127
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	192	1661	116	430	1458	637	285	349	193	405	687	135
Arrive On Green	0.06	0.34	0.34	0.13	0.41	0.41	0.16	0.16	0.16	0.23	0.23	0.23
Sat Flow, veh/h	3428	4824	337	3428	3526	1540	1767	2170	1200	1767	2995	590
Grp Volume(v), veh/h	146	860	455	385	1417	184	115	134	131	355	399	372
Grp Sat Flow(s), veh/h/ln	1714	1689	1785	1714	1763	1540	1767	1763	1607	1767	1856	1729
Q Serve(g_s), s	5.9	31.4	31.4	15.5	55.2	11.1	8.2	9.6	10.4	27.1	29.5	29.6
Cycle Q Clear(g_c), s	5.9	31.4	31.4	15.5	55.2	11.1	8.2	9.6	10.4	27.1	29.5	29.6
Prop In Lane	1.00		0.19	1.00		1.00	1.00		0.75	1.00		0.34
Lane Grp Cap(c), veh/h	192	1163	615	430	1458	637	285	284	259	405	425	396
V/C Ratio(X)	0.76	0.74	0.74	0.90	0.97	0.29	0.40	0.47	0.51	0.88	0.94	0.94
Avail Cap(c_a), veh/h	198	1163	615	688	1488	650	285	284	259	456	478	446
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.49	0.49	0.49	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	65.1	40.4	40.4	60.3	40.2	27.3	52.7	53.3	53.6	52.0	53.0	53.0
Incr Delay (d2), s/veh	13.5	2.2	4.2	3.1	10.4	0.0	4.2	5.5	6.9	14.8	23.7	25.5
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	13.3	14.4	6.9	25.4	4.1	4.0	4.7	4.7	13.6	16.4	15.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	78.7	42.6	44.6	63.5	50.7	27.4	56.9	58.8	60.6	66.8	76.7	78.5
LnGrp LOS	E	D	D	E	D	C	E	E	E	E	E	E
Approach Vol, veh/h	1461			1986			380			1126		
Approach Delay, s/veh	46.8			51.0			58.9			74.2		
Approach LOS	D			D			E			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	27.4	53.1		27.4	12.8	62.8		37.0				
Change Period (Y+Rc), s	4.9	4.9		4.9	4.9	4.9		4.9				
Max Green Setting (Gmax), s	39.1	39.1		17.1	8.1	59.1		36.1				
Max Q Clear Time (g_c+I1), s	33.4	33.4		12.4	7.9	57.2		31.6				
Green Ext Time (p_c), s	0.1	1.2		0.1	0.0	0.7		0.5				

Intersection Summary

HCM 6th Ctrl Delay 55.6

HCM 6th LOS E

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 12: US 101 SB Ramps & Guerneville Rd

Lance Drive Residential TIA
Cumulative PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑					↑	↑	↑
Traffic Volume (veh/h)	0	1330	650	350	1620	0	0	0	0	350	80	360
Future Volume (veh/h)	0	1330	650	350	1620	0	0	0	0	350	80	360
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1856	1856	1856	1856	0				1856	1856	1856
Adj Flow Rate, veh/h	0	1371	279	361	1670	0				420	0	337
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	1713	514	406	1733	0				1557	0	693
Arrive On Green	0.00	0.34	0.34	0.12	0.49	0.00				0.44	0.00	0.44
Sat Flow, veh/h	0	5233	1521	3428	3618	0				3534	0	1572
Grp Volume(v), veh/h	0	1371	279	361	1670	0				420	0	337
Grp Sat Flow(s),veh/h/ln	0	1689	1521	1714	1763	0				1767	0	1572
Q Serve(g_s), s	0.0	34.4	20.8	14.5	64.1	0.0				10.6	0.0	21.4
Cycle Q Clear(g_c), s	0.0	34.4	20.8	14.5	64.1	0.0				10.6	0.0	21.4
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1713	514	406	1733	0				1557	0	693
V/C Ratio(X)	0.00	0.80	0.54	0.89	0.96	0.00				0.27	0.00	0.49
Avail Cap(c_a), veh/h	0	2066	620	541	2118	0				1557	0	693
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.47	0.47	0.60	0.60	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	42.0	37.5	60.8	34.4	0.0				24.9	0.0	27.9
Incr Delay (d2), s/veh	0.0	0.7	0.2	7.3	7.1	0.0				0.4	0.0	2.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	14.3	7.8	6.7	28.1	0.0				4.4	0.0	8.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	42.8	37.7	68.1	41.4	0.0				25.3	0.0	30.3
LnGrp LOS	A	D	D	E	D	A				C	A	C
Approach Vol, veh/h		1650			2031						757	
Approach Delay, s/veh		41.9			46.2						27.5	
Approach LOS		D			D						C	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	1.5	52.3		66.3		73.7						
Change Period (Y+Rc), s	4.9	4.9		4.6		4.9						
Max Green Setting (Gmax), s	2.5	57.1		46.4		84.1						
Max Q Clear Time (g_c+I10), s	10.5	36.4		23.4		66.1						
Green Ext Time (p_c), s	0.0	2.1		0.1		2.8						

Intersection Summary

HCM 6th Ctrl Delay 41.4
HCM 6th LOS D

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 13: US 101 NB Ramps & Guerneville Rd/Steele Ln

Lance Drive Residential TIA
Cumulative PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↑↑			↑↑↑		↰	↰↱	↰			
Traffic Volume (veh/h)	460	1220	0	0	1180	280	790	10	400	0	0	0
Future Volume (veh/h)	460	1220	0	0	1180	280	790	10	400	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1856	1856	0	0	1856	1856	1856	1856	1856			
Adj Flow Rate, veh/h	479	1271	0	0	1229	265	923	0	208			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	3	3	0	0	3	3	3	3	3			
Cap, veh/h	1063	2326	0	0	1306	282	963	0	428			
Arrive On Green	0.62	1.00	0.00	0.00	0.31	0.31	0.27	0.00	0.27			
Sat Flow, veh/h	3428	3618	0	0	4320	895	3534	0	1572			
Grp Volume(v), veh/h	479	1271	0	0	999	495	923	0	208			
Grp Sat Flow(s),veh/h/ln	1714	1763	0	0	1689	1671	1767	0	1572			
Q Serve(g_s), s	10.3	0.0	0.0	0.0	40.3	40.3	36.0	0.0	15.5			
Cycle Q Clear(g_c), s	10.3	0.0	0.0	0.0	40.3	40.3	36.0	0.0	15.5			
Prop In Lane	1.00		0.00	0.00		0.54	1.00		1.00			
Lane Grp Cap(c), veh/h	1063	2326	0	0	1062	526	963	0	428			
V/C Ratio(X)	0.45	0.55	0.00	0.00	0.94	0.94	0.96	0.00	0.49			
Avail Cap(c_a), veh/h	1063	2326	0	0	1209	598	1247	0	555			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.73	0.73	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	20.3	0.0	0.0	0.0	46.7	46.7	50.2	0.0	42.7			
Incr Delay (d2), s/veh	0.1	0.7	0.0	0.0	12.5	20.9	13.2	0.0	0.3			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	3.4	0.2	0.0	0.0	18.6	19.6	17.2	0.0	6.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.4	0.7	0.0	0.0	59.2	67.6	63.4	0.0	43.0			
LnGrp LOS	C	A	A	A	E	E	E	A	D			
Approach Vol, veh/h	1750			1494			1131					
Approach Delay, s/veh	6.1			62.0			59.6					
Approach LOS	A			E			E					
Timer - Assigned Phs	2			5			6			8		
Phs Duration (G+Y+Rc), s	97.3			48.3			48.9			42.7		
Change Period (Y+Rc), s	4.9			4.9			4.9			4.6		
Max Green Setting (Gmax), s	81.1			26.1			50.1			49.4		
Max Q Clear Time (g_c+I1), s	2.0			12.3			42.3			38.0		
Green Ext Time (p_c), s	1.9			0.1			1.7			0.1		

Intersection Summary

HCM 6th Ctrl Delay	39.0
HCM 6th LOS	D










Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 14: Stony Point Rd/Marlow Rd & W College Ave

Lance Drive Residential TIA
Cumulative PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	290	130	260	400	230	190	890	300	190	970	120
Future Volume (veh/h)	80	290	130	260	400	230	190	890	300	190	970	120
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	84	305	97	274	421	176	200	937	193	200	1021	115
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	258	375	117	431	583	241	222	1046	842	292	1071	121
Arrive On Green	0.15	0.14	0.14	0.24	0.24	0.24	0.13	0.30	0.30	0.17	0.34	0.34
Sat Flow, veh/h	1767	2632	820	1767	2420	1000	1767	3526	1545	1767	3188	359
Grp Volume(v), veh/h	84	202	200	274	305	292	200	937	193	200	564	572
Grp Sat Flow(s),veh/h/ln	1767	1763	1689	1767	1763	1657	1767	1763	1545	1767	1763	1784
Q Serve(g_s), s	6.0	15.5	16.1	19.4	22.3	22.7	15.6	35.6	3.6	14.9	43.8	43.8
Cycle Q Clear(g_c), s	6.0	15.5	16.1	19.4	22.3	22.7	15.6	35.6	3.6	14.9	43.8	43.8
Prop In Lane	1.00		0.49	1.00		0.60	1.00		1.00	1.00		0.20
Lane Grp Cap(c), veh/h	258	251	241	431	425	399	222	1046	842	292	592	600
V/C Ratio(X)	0.33	0.80	0.83	0.64	0.72	0.73	0.90	0.90	0.23	0.68	0.95	0.95
Avail Cap(c_a), veh/h	258	327	314	431	468	440	226	1136	881	292	601	608
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.41	0.41	0.41	1.00	1.00	1.00	0.35	0.35	0.35
Uniform Delay (d), s/veh	53.6	58.1	58.4	47.3	48.8	49.0	60.3	47.2	5.9	55.0	45.4	45.4
Incr Delay (d2), s/veh	0.7	10.5	13.4	1.3	2.0	2.3	33.8	9.0	0.1	2.3	12.3	12.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	7.6	7.7	8.6	9.9	9.5	9.0	16.6	1.4	6.8	20.7	20.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.4	68.7	71.8	48.6	50.8	51.3	94.1	56.2	6.0	57.3	57.6	57.7
LnGrp LOS	D	E	E	D	D	D	F	E	A	E	E	E
Approach Vol, veh/h	486			871			1330			1336		
Approach Delay, s/veh	67.5			50.3			54.6			57.6		
Approach LOS	E			D			D			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	39.5	25.3	22.9	52.4	25.7	39.0	28.4	46.8				
Change Period (Y+Rc), s	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3				
Max Green Setting (Gmax), s	27.8	26.0	17.9	47.7	16.0	37.2	20.5	45.1				
Max Q Clear Time (g_c+0.1), s	18.1	18.1	17.6	45.8	8.0	24.7	16.9	37.6				
Green Ext Time (p_c), s	0.4	1.3	0.0	1.2	0.1	2.8	0.2	3.9				

Intersection Summary

HCM 6th Ctrl Delay 56.2

HCM 6th LOS E

Notes









User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

15: N Dutton Ave & W College Ave

Lance Drive Residential TIA
Cumulative PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	670	120	220	900	190	170	380	150	350	580	160
Future Volume (veh/h)	100	670	120	220	900	190	170	380	150	350	580	160
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	104	698	113	229	938	183	177	396	121	365	604	141
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	127	746	121	283	1002	195	437	495	149	520	659	154
Arrive On Green	0.07	0.25	0.25	0.16	0.34	0.34	0.25	0.19	0.19	0.29	0.23	0.23
Sat Flow, veh/h	1767	3030	490	1767	2933	572	1767	2655	801	1767	2826	658
Grp Volume(v), veh/h	104	406	405	229	563	558	177	261	256	365	376	369
Grp Sat Flow(s),veh/h/ln	1767	1763	1758	1767	1763	1742	1767	1763	1693	1767	1763	1721
Q Serve(g_s), s	7.5	29.3	29.4	16.3	40.2	40.3	10.9	18.4	18.8	23.9	27.0	27.2
Cycle Q Clear(g_c), s	7.5	29.3	29.4	16.3	40.2	40.3	10.9	18.4	18.8	23.9	27.0	27.2
Prop In Lane	1.00		0.28	1.00		0.33	1.00		0.47	1.00		0.38
Lane Grp Cap(c), veh/h	127	434	433	283	602	595	437	329	316	520	411	402
V/C Ratio(X)	0.82	0.93	0.94	0.81	0.94	0.94	0.41	0.79	0.81	0.70	0.91	0.92
Avail Cap(c_a), veh/h	150	462	461	394	706	698	437	462	444	520	517	504
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.73	0.73	0.73	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	59.5	48.0	48.0	52.7	41.4	41.4	40.9	50.5	50.7	40.8	48.6	48.6
Incr Delay (d2), s/veh	17.2	20.0	20.3	5.8	17.1	17.5	0.2	4.1	5.1	3.6	16.4	17.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.0	15.1	15.1	7.6	20.0	19.8	4.8	8.4	8.4	10.7	13.5	13.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	76.7	68.0	68.3	58.5	58.6	59.0	41.2	54.6	55.7	44.4	65.0	65.9
LnGrp LOS	E	E	E	E	E	E	D	D	E	D	E	E
Approach Vol, veh/h	915				1350		694				1110	
Approach Delay, s/veh	69.1				58.7		51.6				58.5	
Approach LOS	E				E		D				E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	24.7	35.9	35.1	34.2	12.3	48.3	41.2	28.1				
Change Period (Y+Rc), s	3.9	* 3.9	3.0	3.9	3.0	3.9	3.0	3.9				
Max Green Setting (Gmax), s	29.0	* 34	15.0	38.1	11.0	52.1	19.0	34.1				
Max Q Clear Time (g_c+I1), s	11.3	31.4	12.9	29.2	9.5	42.3	25.9	20.8				
Green Ext Time (p_c), s	0.1	0.7	0.0	1.2	0.0	2.1	0.0	0.9				

Intersection Summary

HCM 6th Ctrl Delay 59.8

HCM 6th LOS E

Notes





User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection

Intersection Delay, s/veh 7.4

Intersection LOS A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	0	0	90	0	0	0	80	0	0
Future Vol, veh/h	0	0	0	0	0	90	0	0	0	80	0	0
Peak Hour Factor	0.86	0.86	0.92	0.92	0.86	0.86	0.92	0.92	0.92	0.86	0.92	0.86
Heavy Vehicles, %	3	3	2	2	3	3	2	2	2	3	2	3
Mvmt Flow	0	0	0	0	0	105	0	0	0	93	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0























Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	0	7	0	7.9
HCM LOS	-	A	-	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	0%	0%	100%
Vol Thru, %	100%	100%	0%	0%
Vol Right, %	0%	0%	100%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	0	0	90	80
LT Vol	0	0	0	80
Through Vol	0	0	0	0
RT Vol	0	0	90	0
Lane Flow Rate	0	0	105	93
Geometry Grp	1	1	1	1
Degree of Util (X)	0	0	0.102	0.112
Departure Headway (Hd)	4.19	4.196	3.513	4.334
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	0	0	1010	829
Service Time	2.233	2.262	1.57	2.352
HCM Lane V/C Ratio	0	0	0.104	0.112
HCM Control Delay	7.2	7.3	7	7.9
HCM Lane LOS	N	N	A	A
HCM 95th-tile Q	0	0	0.3	0.4

HCM 6th Signalized Intersection Summary







1: Marlow Rd & Marlow Ct/W Steele Ln

Lance Drive Residential TIA
Cumulative Plus Project AM (95-120 Seconds)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	10	10	260	10	220	10	601	260	164	580	10
Future Volume (veh/h)	10	10	10	260	10	220	10	601	260	164	580	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		1.00	1.00		0.96	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	12	12	2	311	0	166	12	699	209	191	674	12
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	33	33	6	1581	0	840	25	884	1082	157	1145	20
Arrive On Green	0.04	0.04	0.04	0.45	0.00	0.45	0.01	0.25	0.25	0.09	0.32	0.32
Sat Flow, veh/h	822	822	137	3534	0	1565	1767	3526	1509	1767	3543	63
Grp Volume(v), veh/h	26	0	0	311	0	166	12	699	209	191	335	351
Grp Sat Flow(s),veh/h/ln	1782	0	0	1767	0	1565	1767	1763	1509	1767	1763	1844
Q Serve(g_s), s	1.6	0.0	0.0	5.9	0.0	0.0	0.7	20.4	5.3	9.8	17.5	17.5
Cycle Q Clear(g_c), s	1.6	0.0	0.0	5.9	0.0	0.0	0.7	20.4	5.3	9.8	17.5	17.5
Prop In Lane	0.46		0.08	1.00		1.00	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	72	0	0	1581	0	840	25	884	1082	157	569	596
V/C Ratio(X)	0.36	0.00	0.00	0.20	0.00	0.20	0.49	0.79	0.19	1.21	0.59	0.59
Avail Cap(c_a), veh/h	308	0	0	1581	0	840	80	1026	1142	157	585	612
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.56	0.56	0.56	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.4	0.0	0.0	18.4	0.0	13.2	53.8	38.5	5.8	50.1	31.1	31.1
Incr Delay (d2), s/veh	3.1	0.0	0.0	0.3	0.0	0.5	8.1	2.1	0.0	140.4	1.5	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.0	2.4	0.0	2.2	0.4	8.9	4.8	10.4	7.5	7.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.5	0.0	0.0	18.7	0.0	13.7	61.9	40.6	5.9	190.5	32.6	32.6
LnGrp LOS	D	A	A	B	A	B	E	D	A	F	C	C
Approach Vol, veh/h	26				477				920			
Approach Delay, s/veh	54.5				17.0				33.0			
Approach LOS	D				B				C			
Timer - Assigned Phs	2		3	4		6		7	8			
Phs Duration (G+Y+Rc), s	53.8		6.4	40.4		9.3		14.7	32.2			
Change Period (Y+Rc), s	4.6		4.9	4.9		4.9		4.9	4.6			
Max Green Setting (Gmax), s	30.2		5.0	36.5		19.0		9.8	32.0			
Max Q Clear Time (g_c+I1), s	7.9		2.7	19.5		3.6		11.8	22.4			
Green Ext Time (p_c), s	1.7		0.0	3.8		0.1		0.0	3.8			
Intersection Summary												
HCM 6th Ctrl Delay	42.9											
HCM 6th LOS	D											
Notes												
User approved pedestrian interval to be less than phase max green.												
User approved volume balancing among the lanes for turning movement.												






















HCM 6th TWSC
2: Iroquois St/Apple Valley Ln & W Steele Ln

Lance Drive Residential TIA
Cumulative Plus Project AM (95-120 Seconds)

Intersection												
Int Delay, s/veh	9.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	40	420	64	23	360	20	61	10	43	20	10	50
Future Vol, veh/h	40	420	64	23	360	20	61	10	43	20	10	50
Conflicting Peds, #/hr	12	0	24	24	0	12	4	0	4	4	0	4
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	60	-	-	80	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	48	506	77	28	434	24	73	12	52	24	12	60
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	470	0	0	607	0	0	1207	1191	573	1191	1217	462
Stage 1	-	-	-	-	-	-	665	665	-	514	514	-
Stage 2	-	-	-	-	-	-	542	526	-	677	703	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1086	-	-	966	-	-	159	187	517	163	180	598
Stage 1	-	-	-	-	-	-	448	456	-	541	534	-
Stage 2	-	-	-	-	-	-	523	527	-	441	438	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1074	-	-	944	-	-	124	167	503	129	161	589
Mov Cap-2 Maneuver	-	-	-	-	-	-	124	167	-	129	161	-
Stage 1	-	-	-	-	-	-	418	425	-	511	512	-
Stage 2	-	-	-	-	-	-	443	505	-	366	409	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.6			0.5			71.2			26.2		
HCM LOS							F			D		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	179	1074	-	-	944	-	-	265				
HCM Lane V/C Ratio	0.767	0.045	-	-	0.029	-	-	0.364				
HCM Control Delay (s)	71.2	8.5	-	-	8.9	-	-	26.2				
HCM Lane LOS	F	A	-	-	A	-	-	D				
HCM 95th %tile Q(veh)	5	0.1	-	-	0.1	-	-	1.6				

HCM 6th Signalized Intersection Summary 3: Range Ave & W Steele Ln

Lance Drive Residential TIA
Cumulative Plus Project AM (95-120 Seconds)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	491	61	60	320	50	50	210	30	40	180	40
Future Volume (veh/h)	50	491	61	60	320	50	50	210	30	40	180	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.96	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	57	558	67	68	364	55	57	239	20	45	205	29
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	664	1142	137	510	1105	167	73	460	38	65	447	62
Arrive On Green	0.70	0.70	0.70	0.70	0.70	0.70	0.04	0.14	0.14	0.04	0.14	0.14
Sat Flow, veh/h	959	1624	195	793	1571	237	1767	3282	272	1767	3087	429
Grp Volume(v), veh/h	57	0	625	68	0	419	57	127	132	45	115	119
Grp Sat Flow(s),veh/h/ln	959	0	1819	793	0	1808	1767	1763	1792	1767	1763	1753
Q Serve(g_s), s	2.3	0.0	14.7	4.0	0.0	8.5	3.0	6.4	6.5	2.4	5.7	5.9
Cycle Q Clear(g_c), s	10.8	0.0	14.7	18.8	0.0	8.5	3.0	6.4	6.5	2.4	5.7	5.9
Prop In Lane	1.00		0.11	1.00		0.13	1.00		0.15	1.00		0.24
Lane Grp Cap(c), veh/h	664	0	1280	510	0	1272	73	247	251	65	255	254
V/C Ratio(X)	0.09	0.00	0.49	0.13	0.00	0.33	0.78	0.52	0.52	0.70	0.45	0.47
Avail Cap(c_a), veh/h	664	0	1280	510	0	1272	149	466	473	149	466	463
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.83	0.83	0.83	1.00	1.00	1.00
Uniform Delay (d), s/veh	7.5	0.0	6.4	10.6	0.0	5.4	45.1	37.9	37.9	45.2	37.2	37.3
Incr Delay (d2), s/veh	0.3	0.0	1.3	0.5	0.0	0.7	5.6	0.5	0.5	4.9	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	5.0	0.7	0.0	2.8	1.4	2.7	2.8	1.1	2.4	2.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	7.8	0.0	7.7	11.2	0.0	6.1	50.7	38.4	38.4	50.2	37.6	37.7
LnGrp LOS	A	A	A	B	A	A	D	D	D	D	D	D
Approach Vol, veh/h		682			487			316			279	
Approach Delay, s/veh		7.7			6.8			40.6			39.7	
Approach LOS		A			A			D			D	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		70.4	6.9	17.7		70.4	7.4	17.2				
Change Period (Y+Rc), s		3.6	3.0	3.9		3.6	3.9	* 3.9				
Max Green Setting (Gmax), s		51.4	8.0	25.1		51.4	8.0	* 25				
Max Q Clear Time (g_c+I1), s		16.7	5.0	7.9		20.8	4.4	8.5				
Green Ext Time (p_c), s		1.5	0.0	0.4		1.0	0.0	0.4				
Intersection Summary												
HCM 6th Ctrl Delay			18.4									
HCM 6th LOS			B									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

HCM 6th Signalized Intersection Summary

4: Marlow Rd & Guerneville Rd

Lance Drive Residential TIA
Cumulative Plus Project AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	140	538	170	198	342	111	150	560	210	141	590	100
Future Volume (veh/h)	140	538	170	198	342	111	150	560	210	141	590	100
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	152	585	119	215	372	95	163	609	105	153	641	95
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	177	763	475	169	602	152	154	780	492	219	792	117
Arrive On Green	0.10	0.22	0.22	0.10	0.22	0.22	0.09	0.22	0.22	0.12	0.26	0.26
Sat Flow, veh/h	1767	3526	1559	1767	2783	702	1767	3526	1542	1767	3071	454
Grp Volume(v), veh/h	152	585	119	215	234	233	163	609	105	153	367	369
Grp Sat Flow(s),veh/h/ln	1767	1763	1559	1767	1763	1722	1767	1763	1542	1767	1763	1763
Q Serve(g_s), s	8.0	14.8	2.5	9.1	11.4	11.7	8.3	15.4	0.0	7.9	18.6	18.6
Cycle Q Clear(g_c), s	8.0	14.8	2.5	9.1	11.4	11.7	8.3	15.4	0.0	7.9	18.6	18.6
Prop In Lane	1.00		1.00	1.00		0.41	1.00		1.00	1.00		0.26
Lane Grp Cap(c), veh/h	177	763	475	169	381	373	154	780	492	219	455	455
V/C Ratio(X)	0.86	0.77	0.25	1.27	0.61	0.63	1.06	0.78	0.21	0.70	0.81	0.81
Avail Cap(c_a), veh/h	177	965	564	169	475	464	154	1065	616	219	557	557
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.98	0.98	0.98	0.44	0.44	0.44	0.88	0.88	0.88
Uniform Delay (d), s/veh	42.1	35.0	6.3	43.0	33.6	33.7	43.3	34.8	23.7	39.9	33.0	33.1
Incr Delay (d2), s/veh	32.3	2.9	0.3	159.0	7.1	7.6	63.5	1.2	0.1	8.3	6.4	6.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.0	6.4	1.4	11.3	5.4	5.5	6.2	6.5	1.7	3.9	8.5	8.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	74.4	37.9	6.6	202.0	40.7	41.3	106.8	36.0	23.8	48.2	39.4	39.6
LnGrp LOS	E	D	A	F	D	D	F	D	C	D	D	D
Approach Vol, veh/h	856		682			877			889			
Approach Delay, s/veh	40.0		91.7			47.7			41.0			
Approach LOS	D		F			D			D			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	4.8	26.2	13.6	29.8	14.8	26.2	17.1	26.3				
Change Period (Y+Rc), s	5.7	* 5.7	5.3	5.3	5.3	5.7	5.3	5.3				
Max Green Setting (Gmax), s	26	* 26	8.3	30.0	9.5	25.6	9.6	28.7				
Max Q Clear Time (g_c+I1), s	16.8	16.8	10.3	20.6	10.0	13.7	9.9	17.4				
Green Ext Time (p_c), s	0.0	2.8	0.0	3.1	0.0	2.0	0.0	3.2				

Intersection Summary

HCM 6th Ctrl Delay 53.0

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary

5: Ridley Ave & Guerneville Rd

Lance Drive Residential TIA
Cumulative Plus Project AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	829	30	76	571	20	50	10	72	40	10	30
Future Volume (veh/h)	30	829	30	76	571	20	50	10	72	40	10	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	0.99		0.97	0.99		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	34	931	33	85	642	21	56	11	33	45	11	9
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	696	2811	100	504	2823	92	145	36	60	178	42	25
Arrive On Green	0.81	0.81	0.81	1.00	1.00	1.00	0.12	0.12	0.12	0.12	0.12	0.12
Sat Flow, veh/h	765	3470	123	578	3483	114	731	306	510	977	363	215
Grp Volume(v), veh/h	34	473	491	85	325	338	100	0	0	65	0	0
Grp Sat Flow(s),veh/h/ln	765	1763	1830	578	1763	1834	1547	0	0	1555	0	0
Q Serve(g_s), s	0.8	6.6	6.6	1.5	0.0	0.0	2.1	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.8	6.6	6.6	8.1	0.0	0.0	5.4	0.0	0.0	3.3	0.0	0.0
Prop In Lane	1.00		0.07	1.00		0.06	0.56		0.33	0.69		0.14
Lane Grp Cap(c), veh/h	696	1428	1483	504	1428	1486	240	0	0	246	0	0
V/C Ratio(X)	0.05	0.33	0.33	0.17	0.23	0.23	0.42	0.00	0.00	0.26	0.00	0.00
Avail Cap(c_a), veh/h	696	1428	1483	504	1428	1486	590	0	0	590	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.84	0.84	0.84	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	1.8	2.3	2.3	0.3	0.0	0.0	39.3	0.0	0.0	38.5	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.5	0.5	0.1	0.0	0.0	0.4	0.0	0.0	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln0.1	1.3	1.3	0.0	0.0	0.0	0.0	2.2	0.0	0.0	1.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	1.9	2.9	2.8	0.4	0.0	0.0	39.8	0.0	0.0	38.7	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	D	A	A	D	A	A
Approach Vol, veh/h	998			748			100			65		
Approach Delay, s/veh	2.8			0.1			39.8			38.7		
Approach LOS	A			A			D			D		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	80.9			14.1			80.9			14.1		
Change Period (Y+Rc), s	3.9			3.0			3.9			3.0		
Max Green Setting (Gmax), s	54.1			34.0			54.1			34.0		
Max Q Clear Time (g_c+I1), s	8.6			5.3			10.1			7.4		
Green Ext Time (p_c), s	2.0			0.2			1.7			0.3		

Intersection Summary

HCM 6th Ctrl Delay	4.9
HCM 6th LOS	A

Notes








User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

6: Lance Dr & Guerneville Rd

Lance Drive Residential TIA
Cumulative Plus Project AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	48	866	30	30	526	99	20	64	80	178	112	119
Future Volume (veh/h)	48	866	30	30	526	99	20	64	80	178	112	119
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	57	1031	35	36	626	98	24	76	59	212	133	127
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	87	1124	38	80	1126	491	98	291	204	272	143	133
Arrive On Green	0.02	0.11	0.11	0.01	0.11	0.11	0.34	0.34	0.34	0.34	0.34	0.34
Sat Flow, veh/h	1767	3476	118	1767	3526	1537	161	866	606	647	427	395
Grp Volume(v), veh/h	57	523	543	36	626	98	159	0	0	472	0	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1831	1767	1763	1537	1634	0	0	1469	0	0
Q Serve(g_s), s	3.0	27.9	27.9	1.9	16.0	5.5	0.0	0.0	0.0	23.5	0.0	0.0
Cycle Q Clear(g_c), s	3.0	27.9	27.9	1.9	16.0	5.5	6.4	0.0	0.0	29.9	0.0	0.0
Prop In Lane	1.00		0.06	1.00		1.00	0.15		0.37	0.45		0.27
Lane Grp Cap(c), veh/h	87	570	592	80	1126	491	593	0	0	548	0	0
V/C Ratio(X)	0.66	0.92	0.92	0.45	0.56	0.20	0.27	0.00	0.00	0.86	0.00	0.00
Avail Cap(c_a), veh/h	125	737	765	143	1510	658	601	0	0	556	0	0
HCM Platoon Ratio	0.33	0.33	0.33	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.95	0.95	0.95	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	45.9	41.2	41.2	45.6	36.1	31.4	23.1	0.0	0.0	30.8	0.0	0.0
Incr Delay (d2), s/veh	3.1	12.2	11.9	1.4	1.9	0.9	0.1	0.0	0.0	12.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	15.0	15.5	0.9	7.8	2.2	2.6	0.0	0.0	12.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.0	53.4	53.1	47.0	38.0	32.3	23.1	0.0	0.0	43.0	0.0	0.0
LnGrp LOS	D	D	D	D	D	C	C	A	A	D	A	A
Approach Vol, veh/h	1123		760				159		472			
Approach Delay, s/veh	53.0		37.7				23.1		43.0			
Approach LOS	D		D				C		D			
Timer - Assigned Phs	1	2	4		5	6	8					
Phs Duration (G+Y+Rc), s	9.6	36.0	36.5		10.0	35.7	36.5					
Change Period (Y+Rc), s	5.3	5.3	4.6		5.3	5.3	4.6					
Max Green Setting (Gmax), s	39.7	39.7	32.4		6.7	40.7	32.4					
Max Q Clear Time (g_c+11.5), s	29.9	29.9	31.9		5.0	18.0	8.4					
Green Ext Time (p_c), s	0.0	0.8	0.1		0.0	0.7	0.2					

Intersection Summary

HCM 6th Ctrl Delay 44.6
HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

7: N Dutton Ave/Westberry Dr & Guerneville Rd

Lance Drive Residential TIA
Cumulative Plus Project AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	1069	155	290	572	10	113	10	440	30	10	10
Future Volume (veh/h)	10	1069	155	290	572	10	113	10	440	30	10	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	12	1288	181	349	689	11	145	0	219	36	12	5
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	30	1080	151	1113	2328	37	186	0	593	70	23	10
Arrive On Green	0.02	0.35	0.35	0.32	0.66	0.66	0.05	0.00	0.05	0.06	0.06	0.06
Sat Flow, veh/h	1767	3098	432	3428	3550	57	3534	0	1564	1196	399	166
Grp Volume(v), veh/h	12	729	740	349	342	358	145	0	219	53	0	0
Grp Sat Flow(s), veh/h/ln	1767	1763	1768	1714	1763	1843	1767	0	1564	1761	0	0
Q Serve(g_s), s	0.6	33.1	33.1	7.3	7.9	7.9	3.9	0.0	0.0	2.8	0.0	0.0
Cycle Q Clear(g_c), s	0.6	33.1	33.1	7.3	7.9	7.9	3.9	0.0	0.0	2.8	0.0	0.0
Prop In Lane	1.00		0.24	1.00		0.03	1.00		1.00	0.68		0.09
Lane Grp Cap(c), veh/h	30	614	616	1113	1156	1209	186	0	593	103	0	0
V/C Ratio(X)	0.40	1.19	1.20	0.31	0.30	0.30	0.78	0.00	0.37	0.51	0.00	0.00
Avail Cap(c_a), veh/h	112	614	616	1113	1156	1209	186	0	593	514	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.72	0.72	0.72	0.90	0.90	0.90	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	46.2	30.9	31.0	24.1	7.0	7.0	44.5	0.0	21.4	43.4	0.0	0.0
Incr Delay (d2), s/veh	2.2	95.8	101.8	0.1	0.6	0.6	17.3	0.0	0.1	1.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	29.4	30.5	2.8	2.6	2.7	2.1	0.0	3.4	1.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.4	126.7	132.8	24.2	7.6	7.5	61.8	0.0	21.5	44.9	0.0	0.0
LnGrp LOS	D	F	F	C	A	A	E	A	C	D	A	A
Approach Vol, veh/h	1481			1049			364			53		
Approach Delay, s/veh	129.1			13.1			37.6			44.9		
Approach LOS	F			B			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	36.1	38.4		10.2	6.9	67.6		10.3				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		5.3				
Max Green Setting (Gmax), s	33.1	33.1		27.7	6.0	35.8		5.0				
Max Q Clear Time (g_c+1/3), s	35.1	35.1		4.8	2.6	9.9		5.9				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	0.5		0.0				

Intersection Summary

HCM 6th Ctrl Delay 75.0

HCM 6th LOS E

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

8: Herbert St/Coffey Ln & Guerneville Rd

Lance Drive Residential TIA
Cumulative Plus Project AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	150	1339	40	30	652	50	30	20	20	90	10	180
Future Volume (veh/h)	150	1339	40	30	652	50	30	20	20	90	10	180
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		0.95	1.00		0.94	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	174	1557	46	35	758	55	35	23	6	105	12	76
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	201	1175	35	570	1810	131	65	43	11	158	18	329
Arrive On Green	0.11	0.34	0.34	0.32	0.54	0.54	0.07	0.07	0.07	0.10	0.10	0.10
Sat Flow, veh/h	1767	3490	103	1767	3320	241	965	634	165	1594	182	1513
Grp Volume(v), veh/h	174	784	819	35	402	411	64	0	0	117	0	76
Grp Sat Flow(s), veh/h/ln	1767	1763	1830	1767	1763	1798	1765	0	0	1776	0	1513
Q Serve(g_s), s	11.1	38.7	38.7	1.6	15.5	15.5	4.0	0.0	0.0	7.3	0.0	4.8
Cycle Q Clear(g_c), s	11.1	38.7	38.7	1.6	15.5	15.5	4.0	0.0	0.0	7.3	0.0	4.8
Prop In Lane	1.00		0.06	1.00		0.13	0.55		0.09	0.90		1.00
Lane Grp Cap(c), veh/h	201	593	616	570	961	980	118	0	0	176	0	329
V/C Ratio(X)	0.86	1.32	1.33	0.06	0.42	0.42	0.54	0.00	0.00	0.66	0.00	0.23
Avail Cap(c_a), veh/h	364	593	616	570	961	980	384	0	0	401	0	521
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.51	0.51	0.51	0.88	0.88	0.88	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	50.1	38.1	38.2	26.9	15.4	15.4	51.9	0.0	0.0	49.9	0.0	37.5
Incr Delay (d2), s/veh	2.2	150.9	154.0	0.0	1.2	1.2	1.4	0.0	0.0	1.6	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.9	40.8	42.9	0.7	6.1	6.3	1.8	0.0	0.0	3.3	0.0	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.3	189.1	192.2	26.9	16.6	16.6	53.4	0.0	0.0	51.5	0.0	37.6
LnGrp LOS	D	F	F	C	B	B	D	A	A	D	A	D
Approach Vol, veh/h	1777			848			64			193		
Approach Delay, s/veh	177.1			17.0			53.4			46.1		
Approach LOS	F			B			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	42.4	44.0		16.3	18.4	68.0		12.3				
Change Period (Y+Rc), s	5.3	5.3		4.9	5.3	5.3		4.6				
Max Green Setting (Gmax), s	5.2	38.7		26.0	23.7	20.2		25.0				
Max Q Clear Time (g_c+I1), s	13.6	40.7		9.3	13.1	17.5		6.0				
Green Ext Time (p_c), s	0.0	0.0		0.1	0.0	0.3		0.1				

Intersection Summary

HCM 6th Ctrl Delay 118.5

HCM 6th LOS F

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

9: Range Ave & Guerneville Rd

Lance Drive Residential TIA
Cumulative Plus Project AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	170	897	182	90	501	10	161	110	90	41	120	130
Future Volume (veh/h)	170	897	182	90	501	10	161	110	90	41	120	130
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	181	954	0	96	533	0	102	213	19	44	128	38
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	286	1022		112	673		191	362	32	130	197	56
Arrive On Green	0.16	0.29	0.00	0.06	0.19	0.00	0.11	0.11	0.11	0.02	0.02	0.02
Sat Flow, veh/h	1767	3618	0	1767	3618	0	1767	3350	296	1767	2680	761
Grp Volume(v), veh/h	181	954	0	96	533	0	102	117	115	44	82	84
Grp Sat Flow(s), veh/h/ln	1767	1763	0	1767	1763	0	1767	1856	1790	1767	1763	1678
Q Serve(g_s), s	9.1	25.0	0.0	5.1	13.7	0.0	5.2	5.7	5.8	2.3	4.4	4.7
Cycle Q Clear(g_c), s	9.1	25.0	0.0	5.1	13.7	0.0	5.2	5.7	5.8	2.3	4.4	4.7
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.17	1.00		0.45
Lane Grp Cap(c), veh/h	286	1022		112	673		191	200	193	130	129	123
V/C Ratio(X)	0.63	0.93		0.86	0.79		0.53	0.58	0.60	0.34	0.64	0.68
Avail Cap(c_a), veh/h	286	1058		112	1058		614	645	622	130	130	124
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	0.61	0.61	0.00	0.95	0.95	0.00	1.00	1.00	1.00	0.83	0.83	0.83
Uniform Delay (d), s/veh	37.2	32.8	0.0	44.1	36.6	0.0	40.1	40.3	40.4	44.1	45.1	45.2
Incr Delay (d2), s/veh	2.1	9.4	0.0	42.0	8.8	0.0	0.9	1.0	1.1	0.5	6.3	9.8
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	4.0	11.4	0.0	3.5	6.6	0.0	2.3	2.6	2.6	1.0	2.1	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	39.2	42.3	0.0	86.1	45.5	0.0	41.0	41.3	41.5	44.6	51.4	55.1
LnGrp LOS	D	D		F	D		D	D	D	D	D	E
Approach Vol, veh/h	1135		A	629		A	334		210			
Approach Delay, s/veh	41.8			51.7			41.3		51.4			
Approach LOS	D			D			D		D			
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	1.3	32.8		12.3	20.7	23.4		14.9				
Change Period (Y+Rc), s	5.3	5.3		5.3	5.3	5.3		4.6				
Max Green Setting (Gmax), s	6.0	28.5		7.0	6.0	28.5		33.0				
Max Q Clear Time (g_c+11), s	6.0	27.0		6.7	11.1	15.7		7.8				
Green Ext Time (p_c), s	0.0	0.3		0.0	0.0	0.6		0.2				

Intersection Summary

HCM 6th Ctrl Delay 45.3
HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.













Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

10: Guerneville Rd & Steele Wy

Lance Drive Residential TIA
Cumulative Plus Project AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	946	52	70	550	10	31	20	70	461	20	20
Future Volume (veh/h)	30	946	52	70	550	10	31	20	70	461	20	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	34	1075	39	80	625	10	29	31	18	540	0	17
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	694	1856	927	218	700	11	112	118	199	604	0	885
Arrive On Green	0.39	0.53	0.53	0.06	0.20	0.20	0.06	0.06	0.06	0.17	0.00	0.17
Sat Flow, veh/h	1767	3526	1571	3428	3549	57	1767	1856	1558	3534	0	1567
Grp Volume(v), veh/h	34	1075	39	80	310	325	29	31	18	540	0	17
Grp Sat Flow(s),veh/h/ln	1767	1763	1571	1714	1763	1843	1767	1856	1558	1767	0	1567
Q Serve(g_s), s	1.3	22.8	1.1	2.5	18.9	18.9	1.7	1.8	1.1	16.4	0.0	0.0
Cycle Q Clear(g_c), s	1.3	22.8	1.1	2.5	18.9	18.9	1.7	1.8	1.1	16.4	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.03	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	694	1856	927	218	348	364	112	118	199	604	0	885
V/C Ratio(X)	0.05	0.58	0.04	0.37	0.89	0.89	0.26	0.26	0.09	0.89	0.00	0.02
Avail Cap(c_a), veh/h	694	1856	927	218	476	498	434	455	482	868	0	1002
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.75	0.75	0.75	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	20.7	17.7	9.5	49.4	43.0	43.0	49.0	49.1	42.4	44.6	0.0	10.6
Incr Delay (d2), s/veh	0.0	1.0	0.1	0.4	12.3	11.9	0.4	0.4	0.1	6.7	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	9.0	0.5	1.1	9.2	9.6	0.8	0.8	0.4	7.7	0.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.7	18.7	9.5	49.8	55.3	54.9	49.5	49.5	42.5	51.4	0.0	10.6
LnGrp LOS	C	B	A	D	E	D	D	D	D	D	A	B
Approach Vol, veh/h	1148					715	78			557		
Approach Delay, s/veh	18.5					54.5	47.9			50.1		
Approach LOS	B					D	D			D		
Timer - Assigned Phs	1	2	4		5	6	8					
Phs Duration (G+Y+Rc), s	1.9	62.8	23.7		48.1	26.6	11.6					
Change Period (Y+Rc), s	4.9	4.9	4.9		4.9	4.9	4.6					
Max Green Setting (Gmax), s	7.0	29.7	27.0		7.0	29.7	27.0					
Max Q Clear Time (g_c+14.5), s	14.5	24.8	18.4		3.3	20.9	3.8					
Green Ext Time (p_c), s	0.0	1.0	0.1		0.0	0.5	0.0					

Intersection Summary

HCM 6th Ctrl Delay 36.8

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

11: Cleveland Ave & Guerneville Rd

Lance Drive Residential TIA
Cumulative Plus Project AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↑↑↓		↰↱	↑↑	↱	↰	↑↓		↰	↑↓	
Traffic Volume (veh/h)	70	1407	40	210	990	230	40	110	170	270	80	50
Future Volume (veh/h)	70	1407	40	210	990	230	40	110	170	270	80	50
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	77	1546	41	231	1088	153	44	121	80	297	88	39
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	236	1553	41	298	1144	499	500	590	361	415	142	63
Arrive On Green	0.07	0.31	0.31	0.09	0.32	0.32	0.28	0.28	0.28	0.12	0.12	0.12
Sat Flow, veh/h	3428	5071	134	3428	3526	1538	1767	2084	1276	3534	1212	537
Grp Volume(v), veh/h	77	1030	557	231	1088	153	44	101	100	297	0	127
Grp Sat Flow(s), veh/h/ln	1714	1689	1828	1714	1763	1538	1767	1763	1597	1767	0	1749
Q Serve(g_s), s	2.0	28.9	28.9	6.3	28.6	7.1	1.7	4.1	4.6	7.7	0.0	6.6
Cycle Q Clear(g_c), s	2.0	28.9	28.9	6.3	28.6	7.1	1.7	4.1	4.6	7.7	0.0	6.6
Prop In Lane	1.00		0.07	1.00		1.00	1.00		0.80	1.00		0.31
Lane Grp Cap(c), veh/h	236	1034	560	298	1144	499	500	499	452	415	0	205
V/C Ratio(X)	0.33	1.00	1.00	0.78	0.95	0.31	0.09	0.20	0.22	0.72	0.00	0.62
Avail Cap(c_a), veh/h	253	1034	560	328	1158	505	500	499	452	1008	0	499
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.70	0.70	0.70	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	42.1	32.9	32.9	42.5	31.3	24.1	25.0	25.9	26.1	40.4	0.0	39.9
Incr Delay (d2), s/veh	0.3	26.8	36.8	6.3	12.2	0.1	0.3	0.9	1.1	0.9	0.0	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	15.1	17.9	2.9	13.5	2.5	0.8	1.8	1.9	3.3	0.0	2.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.4	59.6	69.7	48.7	43.6	24.2	25.4	26.8	27.2	41.3	0.0	41.0
LnGrp LOS	D	E	E	D	D	C	C	C	C	D	A	D
Approach Vol, veh/h	1664			1472			245			424		
Approach Delay, s/veh	62.2			42.4			26.7			41.2		
Approach LOS	E			D			C			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	3.2	34.0		31.8	11.4	35.7		16.1				
Change Period (Y+Rc), s	4.9	4.9		4.9	4.9	4.9		4.9				
Max Green Setting (Gmax), s	29.1			10.1	7.0	31.2		27.1				
Max Q Clear Time (g_c+1/3), s	30.9			6.6	4.0	30.6		9.7				
Green Ext Time (p_c), s	0.0	0.0		0.1	0.0	0.2		0.1				

Intersection Summary

HCM 6th Ctrl Delay	49.9
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.
User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 12: US 101 SB Ramps & Guerneville Rd

Lance Drive Residential TIA
Cumulative Plus Project AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑					↑	↑	↑
Traffic Volume (veh/h)	0	1244	603	310	1082	0	0	0	0	420	10	338
Future Volume (veh/h)	0	1244	603	310	1082	0	0	0	0	420	10	338
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1856	1856	1856	1856	0				1856	1856	1856
Adj Flow Rate, veh/h	0	1398	268	348	1216	0				480	0	323
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89				0.89	0.89	0.89
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	1546	472	414	1683	0				1493	0	664
Arrive On Green	0.00	0.31	0.31	0.12	0.48	0.00				0.42	0.00	0.42
Sat Flow, veh/h	0	5233	1545	3428	3618	0				3534	0	1572
Grp Volume(v), veh/h	0	1398	268	348	1216	0				480	0	323
Grp Sat Flow(s),veh/h/ln	0	1689	1545	1714	1763	0				1767	0	1572
Q Serve(g_s), s	0.0	25.2	13.8	9.4	26.1	0.0				8.6	0.0	14.2
Cycle Q Clear(g_c), s	0.0	25.2	13.8	9.4	26.1	0.0				8.6	0.0	14.2
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1546	472	414	1683	0				1493	0	664
V/C Ratio(X)	0.00	0.90	0.57	0.84	0.72	0.00				0.32	0.00	0.49
Avail Cap(c_a), veh/h	0	1925	587	545	2082	0				1493	0	664
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.09	0.09	0.66	0.66	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	31.7	27.7	40.9	19.8	0.0				18.3	0.0	19.9
Incr Delay (d2), s/veh	0.0	0.5	0.0	4.8	0.4	0.0				0.6	0.0	2.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	9.9	4.9	4.2	10.0	0.0				3.4	0.0	5.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	32.2	27.8	45.6	20.2	0.0				18.9	0.0	22.5
LnGrp LOS	A	C	C	D	C	A				B	A	C
Approach Vol, veh/h		1666			1564						803	
Approach Delay, s/veh		31.5			25.9						20.3	
Approach LOS		C			C						C	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	6.4	33.9		44.7		50.3						
Change Period (Y+Rc), s	4.9	4.9		4.6		4.9						
Max Green Setting (Gmax), s	5.5	36.1		29.4		56.1						
Max Q Clear Time (g_c+I1), s	11.4	27.2		16.2		28.1						
Green Ext Time (p_c), s	0.0	1.8		0.1		1.8						

Intersection Summary

HCM 6th Ctrl Delay 27.1
HCM 6th LOS C

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 13: US 101 NB Ramps & Guerneville Rd/Steele Ln

Lance Drive Residential TIA
Cumulative Plus Project AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↑↑			↑↑↑		↰	↰↱	↰			
Traffic Volume (veh/h)	473	1191	0	0	953	250	439	10	500	0	0	0
Future Volume (veh/h)	473	1191	0	0	953	250	439	10	500	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1856	1856	0	0	1856	1856	1856	1856	1856			
Adj Flow Rate, veh/h	531	1338	0	0	1071	252	632	0	291			
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89			
Percent Heavy Veh, %	3	3	0	0	3	3	3	3	3			
Cap, veh/h	1220	2457	0	0	1180	277	718	0	319			
Arrive On Green	0.71	1.00	0.00	0.00	0.29	0.29	0.20	0.00	0.20			
Sat Flow, veh/h	3428	3618	0	0	4242	958	3534	0	1572			
Grp Volume(v), veh/h	531	1338	0	0	887	436	632	0	291			
Grp Sat Flow(s),veh/h/ln	1714	1763	0	0	1689	1656	1767	0	1572			
Q Serve(g_s), s	6.1	0.0	0.0	0.0	24.1	24.1	16.5	0.0	17.2			
Cycle Q Clear(g_c), s	6.1	0.0	0.0	0.0	24.1	24.1	16.5	0.0	17.2			
Prop In Lane	1.00		0.00	0.00		0.58	1.00		1.00			
Lane Grp Cap(c), veh/h	1220	2457	0	0	978	479	718	0	319			
V/C Ratio(X)	0.44	0.54	0.00	0.00	0.91	0.91	0.88	0.00	0.91			
Avail Cap(c_a), veh/h	1220	2457	0	0	1177	577	1094	0	487			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.54	0.54	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	9.7	0.0	0.0	0.0	32.5	32.5	36.7	0.0	37.0			
Incr Delay (d2), s/veh	0.0	0.5	0.0	0.0	8.3	15.0	3.8	0.0	11.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	1.8	0.2	0.0	0.0	10.5	11.2	7.1	0.0	7.3			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	9.8	0.5	0.0	0.0	40.8	47.5	40.6	0.0	48.7			
LnGrp LOS	A	A	A	A	D	D	D	A	D			
Approach Vol, veh/h	1869			1323			923					
Approach Delay, s/veh	3.1			43.0			43.1					
Approach LOS	A			D			D					
Timer - Assigned Phs	2			5			6			8		
Phs Duration (G+Y+Rc), s	71.1			38.7			32.4			23.9		
Change Period (Y+Rc), s	4.9			4.9			4.9			4.6		
Max Green Setting (Gmax), s	56.1			18.1			33.1			29.4		
Max Q Clear Time (g_c+I1), s	2.0			8.1			26.1			19.2		
Green Ext Time (p_c), s	2.1			0.1			1.4			0.1		

Intersection Summary

HCM 6th Ctrl Delay	24.9
HCM 6th LOS	C










Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 14: Stony Point Rd/Marlow Rd & W College Ave

Lance Drive Residential TIA
Cumulative Plus Project AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	94	410	170	185	220	150	90	696	192	200	677	81
Future Volume (veh/h)	94	410	170	185	220	150	90	696	192	200	677	81
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	104	456	151	206	244	73	100	773	130	222	752	83
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	244	568	186	336	727	212	126	864	676	218	948	105
Arrive On Green	0.14	0.22	0.22	0.19	0.27	0.27	0.07	0.24	0.24	0.12	0.30	0.30
Sat Flow, veh/h	1767	2595	852	1767	2688	785	1767	3526	1539	1767	3194	352
Grp Volume(v), veh/h	104	308	299	206	158	159	100	773	130	222	415	420
Grp Sat Flow(s),veh/h/ln	1767	1763	1683	1767	1763	1710	1767	1763	1539	1767	1763	1784
Q Serve(g_s), s	5.1	15.7	16.0	10.2	6.8	7.1	5.3	20.1	2.4	11.7	20.6	20.6
Cycle Q Clear(g_c), s	5.1	15.7	16.0	10.2	6.8	7.1	5.3	20.1	2.4	11.7	20.6	20.6
Prop In Lane	1.00		0.51	1.00		0.46	1.00		1.00	1.00		0.20
Lane Grp Cap(c), veh/h	244	386	368	336	477	463	126	864	676	218	523	529
V/C Ratio(X)	0.43	0.80	0.81	0.61	0.33	0.34	0.79	0.90	0.19	1.02	0.79	0.79
Avail Cap(c_a), veh/h	244	482	461	336	508	493	136	891	688	218	527	533
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.36	0.36	0.36	1.00	1.00	1.00	0.51	0.51	0.51
Uniform Delay (d), s/veh	37.5	35.1	35.2	35.3	27.8	27.9	43.4	34.7	5.6	41.7	30.7	30.7
Incr Delay (d2), s/veh	1.2	7.5	8.5	1.2	0.1	0.2	25.4	11.4	0.1	48.7	4.3	4.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.2	7.3	7.1	4.3	2.8	2.8	3.1	9.6	1.0	7.9	8.9	9.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.7	42.6	43.7	36.5	27.9	28.0	68.8	46.1	5.7	90.4	35.0	35.0
LnGrp LOS	D	D	D	D	C	C	E	D	A	F	C	C
Approach Vol, veh/h	711		523			1003			1057			
Approach Delay, s/veh	42.5		31.3			43.1			46.6			
Approach LOS	D		C			D			D			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	83.3	26.1	12.1	33.5	18.4	31.0	17.0	28.6				
Change Period (Y+Rc), s	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3				
Max Green Setting (Gmax), s	22.5	26.0	7.3	28.4	10.7	27.4	11.7	24.0				
Max Q Clear Time (g_c+I1), s	12.2	18.0	7.3	22.6	7.1	9.1	13.7	22.1				
Green Ext Time (p_c), s	0.0	2.2	0.0	2.4	0.1	1.6	0.0	1.0				

Intersection Summary

HCM 6th Ctrl Delay 42.2

HCM 6th LOS D

Notes









User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

15: N Dutton Ave & W College Ave

Lance Drive Residential TIA
Cumulative Plus Project AM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	110	810	110	100	610	337	90	428	120	249	272	60
Future Volume (veh/h)	110	810	110	100	610	337	90	428	120	249	272	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	118	871	107	108	656	297	97	460	106	268	292	41
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	146	941	116	135	710	322	346	544	124	492	851	118
Arrive On Green	0.08	0.30	0.30	0.08	0.30	0.30	0.20	0.19	0.19	0.28	0.27	0.27
Sat Flow, veh/h	1767	3152	387	1767	2354	1066	1767	2837	649	1767	3101	430
Grp Volume(v), veh/h	118	487	491	108	491	462	97	284	282	268	165	168
Grp Sat Flow(s),veh/h/ln	1767	1763	1777	1767	1763	1657	1767	1763	1723	1767	1763	1769
Q Serve(g_s), s	6.2	25.4	25.4	5.7	25.6	25.6	4.4	14.8	15.0	12.3	7.1	7.3
Cycle Q Clear(g_c), s	6.2	25.4	25.4	5.7	25.6	25.6	4.4	14.8	15.0	12.3	7.1	7.3
Prop In Lane	1.00		0.22	1.00		0.64	1.00		0.38	1.00		0.24
Lane Grp Cap(c), veh/h	146	526	531	135	532	500	346	338	330	492	484	485
V/C Ratio(X)	0.81	0.93	0.93	0.80	0.92	0.92	0.28	0.84	0.85	0.54	0.34	0.35
Avail Cap(c_a), veh/h	167	570	574	167	570	536	346	410	401	492	577	579
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.60	0.60	0.60	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.8	32.3	32.3	43.1	32.1	32.1	32.5	37.0	37.1	29.2	27.6	27.6
Incr Delay (d2), s/veh	12.3	13.3	13.2	15.6	19.5	20.4	0.2	10.8	12.1	0.7	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	12.3	12.4	3.0	13.3	12.6	1.9	7.2	7.2	5.1	2.9	3.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.1	45.6	45.5	58.8	51.6	52.5	32.7	47.8	49.2	29.9	27.7	27.8
LnGrp LOS	E	D	D	E	D	D	C	D	D	C	C	C
Approach Vol, veh/h	1096				1061				663		601	
Approach Delay, s/veh	46.6				52.7				46.2		28.7	
Approach LOS	D				D				D		C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	12.3	32.3	21.6	30.0	10.9	32.6	29.5	22.1				
Change Period (Y+Rc), s	3.9	* 3.9	3.0	3.9	3.0	3.9	3.0	3.9				
Max Green Setting (Gmax), s	31.0	* 31	10.4	31.1	9.0	30.7	19.4	22.1				
Max Q Clear Time (g_c+11), s	27.4	27.4	6.4	9.3	8.2	27.6	14.3	17.0				
Green Ext Time (p_c), s	0.0	0.9	0.0	0.6	0.0	0.9	0.1	0.7				

Intersection Summary

HCM 6th Ctrl Delay 45.3

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection												
Intersection Delay, s/veh	8.8											
Intersection LOS	A											




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	8	72	0	20	32	69	0	8	55	116	2	3
Future Vol, veh/h	8	72	0	20	32	69	0	8	55	116	2	3
Peak Hour Factor	0.66	0.66	0.92	0.92	0.66	0.66	0.92	0.92	0.92	0.66	0.92	0.66
Heavy Vehicles, %	3	3	2	2	3	3	2	2	2	3	2	3
Mvmt Flow	12	109	0	22	48	105	0	9	60	176	2	5
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.7	8.6	7.8	9.5
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	10%	17%	96%
Vol Thru, %	13%	90%	26%	2%
Vol Right, %	87%	0%	57%	2%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	63	80	121	121
LT Vol	0	8	20	116
Through Vol	8	72	32	2
RT Vol	55	0	69	3
Lane Flow Rate	68	121	175	182
Geometry Grp	1	1	1	1
Degree of Util (X)	0.082	0.161	0.213	0.247
Departure Headway (Hd)	4.322	4.776	4.379	4.882
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	825	749	818	734
Service Time	2.369	2.814	2.414	2.923
HCM Lane V/C Ratio	0.082	0.162	0.214	0.248
HCM Control Delay	7.8	8.7	8.6	9.5
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.3	0.6	0.8	1




HCM 6th TWSC
17: Iroquois St & Project Driveway (1)

Lance Drive Residential TIA
Cumulative Plus Project AM (95-120 Seconds)

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	7	2	82	106	1
Future Vol, veh/h	2	7	2	82	106	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	8	2	89	115	1
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	209	116	116	0	-	0
Stage 1	116	-	-	-	-	-
Stage 2	93	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	779	936	1473	-	-	-
Stage 1	909	-	-	-	-	-
Stage 2	931	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	778	936	1473	-	-	-
Mov Cap-2 Maneuver	778	-	-	-	-	-
Stage 1	908	-	-	-	-	-
Stage 2	931	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	9.1	0.2		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1473	-	896	-	-	
HCM Lane V/C Ratio	0.001	-	0.011	-	-	
HCM Control Delay (s)	7.4	0	9.1	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	




HCM 6th TWSC
18: Iroquois St & Project Driveway (2)

Lance Drive Residential TIA
Cumulative Plus Project AM (95-120 Seconds)

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	8	3	82	113	0
Future Vol, veh/h	2	8	3	82	113	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	9	3	89	123	0
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	218	123	123	0	-	0
Stage 1	123	-	-	-	-	-
Stage 2	95	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	770	928	1464	-	-	-
Stage 1	902	-	-	-	-	-
Stage 2	929	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	768	928	1464	-	-	-
Mov Cap-2 Maneuver	768	-	-	-	-	-
Stage 1	900	-	-	-	-	-
Stage 2	929	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	9.1	0.3		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1464	-	891	-	-	
HCM Lane V/C Ratio	0.002	-	0.012	-	-	
HCM Control Delay (s)	7.5	0	9.1	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	




HCM 6th TWSC
19: Project Driveway (3) & Lance Dr

Lance Drive Residential TIA
Cumulative Plus Project AM (95-120 Seconds)

Intersection						
Int Delay, s/veh	1.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	232	1	14	107	4	37
Future Vol, veh/h	232	1	14	107	4	37
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	252	1	15	116	4	40
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	253	0	399	253
Stage 1	-	-	-	-	253	-
Stage 2	-	-	-	-	146	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1312	-	607	786
Stage 1	-	-	-	-	789	-
Stage 2	-	-	-	-	881	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1312	-	600	786
Mov Cap-2 Maneuver	-	-	-	-	600	-
Stage 1	-	-	-	-	789	-
Stage 2	-	-	-	-	870	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.9		10	
HCM LOS					B	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	763	-	-	1312	-	
HCM Lane V/C Ratio	0.058	-	-	0.012	-	
HCM Control Delay (s)	10	-	-	7.8	0	
HCM Lane LOS	B	-	-	A	A	
HCM 95th %tile Q(veh)	0.2	-	-	0	-	

HCM 6th TWSC
20: Guerneville Rd & Project Driveway (4)

Lance Drive Residential TIA
Cumulative Plus Project AM (95-120 Seconds)

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	918	649	6	16	8
Future Vol, veh/h	3	918	649	6	16	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	998	705	7	17	9
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	712	0	-	0	1214	356
Stage 1	-	-	-	-	709	-
Stage 2	-	-	-	-	505	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	884	-	-	-	174	640
Stage 1	-	-	-	-	449	-
Stage 2	-	-	-	-	571	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	884	-	-	-	173	640
Mov Cap-2 Maneuver	-	-	-	-	173	-
Stage 1	-	-	-	-	445	-
Stage 2	-	-	-	-	571	-
Approach	EB	WB		SB		
HCM Control Delay, s	0	0		22.7		
HCM LOS				C		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	884	-	-	-	229	
HCM Lane V/C Ratio	0.004	-	-	-	0.114	
HCM Control Delay (s)	9.1	0	-	-	22.7	
HCM Lane LOS	A	A	-	-	C	
HCM 95th %tile Q(veh)	0	-	-	-	0.4	

HCM 6th Signalized Intersection Summary







1: Marlow Rd & Marlow Ct/W Steele Ln

Lance Drive Residential TIA
Cumulative Plus Project AM (120 Seconds)

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔	↔	↔	↕	↔	↔	↕	↕
Traffic Volume (veh/h)	10	10	10	260	10	220	10	601	260	164	580	10
Future Volume (veh/h)	10	10	10	260	10	220	10	601	260	164	580	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		1.00	1.00		0.96	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	12	12	2	311	0	166	12	699	209	191	674	12
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	29	29	5	1536	0	879	24	864	1053	223	1258	22
Arrive On Green	0.04	0.04	0.04	0.43	0.00	0.43	0.01	0.25	0.25	0.13	0.36	0.36
Sat Flow, veh/h	822	822	137	3534	0	1565	1767	3526	1508	1767	3543	63
Grp Volume(v), veh/h	26	0	0	311	0	166	12	699	209	191	335	351
Grp Sat Flow(s),veh/h/ln	1781	0	0	1767	0	1565	1767	1763	1508	1767	1763	1844
Q Serve(g_s), s	1.7	0.0	0.0	6.5	0.0	0.0	0.8	22.4	6.2	12.7	18.2	18.2
Cycle Q Clear(g_c), s	1.7	0.0	0.0	6.5	0.0	0.0	0.8	22.4	6.2	12.7	18.2	18.2
Prop In Lane	0.46		0.08	1.00		1.00	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	63	0	0	1536	0	879	24	864	1053	223	626	655
V/C Ratio(X)	0.41	0.00	0.00	0.20	0.00	0.19	0.49	0.81	0.20	0.86	0.54	0.54
Avail Cap(c_a), veh/h	224	0	0	1536	0	879	149	1040	1128	517	883	923
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.55	0.55	0.55	1.00	1.00	1.00
Uniform Delay (d), s/veh	56.6	0.0	0.0	21.0	0.0	12.9	58.8	42.7	7.1	51.3	30.8	30.8
Incr Delay (d2), s/veh	4.2	0.0	0.0	0.3	0.0	0.5	8.3	2.3	0.1	9.0	0.7	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	0.0	2.8	0.0	2.3	0.4	9.9	5.4	6.1	7.7	8.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.8	0.0	0.0	21.3	0.0	13.4	67.1	45.0	7.2	60.4	31.5	31.5
LnGrp LOS	E	A	A	C	A	B	E	D	A	E	C	C
Approach Vol, veh/h		26			477			920			877	
Approach Delay, s/veh		60.8			18.6			36.7			37.8	
Approach LOS		E			B			D			D	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		56.8	6.5	47.5		9.2	20.1	34.0				
Change Period (Y+Rc), s		4.6	4.9	4.9		4.9	4.9	4.6				
Max Green Setting (Gmax), s		15.4	10.1	60.1		15.1	35.1	35.4				
Max Q Clear Time (g_c+I1), s		8.5	2.8	20.2		3.7	14.7	24.4				
Green Ext Time (p_c), s		1.0	0.0	4.6		0.0	0.5	4.1				
Intersection Summary												
HCM 6th Ctrl Delay			33.6									
HCM 6th LOS			C									
Notes												
User approved pedestrian interval to be less than phase max green.												
User approved volume balancing among the lanes for turning movement.												






















HCM 6th TWSC
2: Iroquois St/Apple Valley Ln & W Steele Ln

Lance Drive Residential TIA
Cumulative Plus Project AM (120 Seconds)

Intersection												
Int Delay, s/veh	9.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	40	420	64	23	360	20	61	10	43	20	10	50
Future Vol, veh/h	40	420	64	23	360	20	61	10	43	20	10	50
Conflicting Peds, #/hr	12	0	24	24	0	12	4	0	4	4	0	4
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	60	-	-	80	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	48	506	77	28	434	24	73	12	52	24	12	60
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	470	0	0	607	0	0	1207	1191	573	1191	1217	462
Stage 1	-	-	-	-	-	-	665	665	-	514	514	-
Stage 2	-	-	-	-	-	-	542	526	-	677	703	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1086	-	-	966	-	-	159	187	517	163	180	598
Stage 1	-	-	-	-	-	-	448	456	-	541	534	-
Stage 2	-	-	-	-	-	-	523	527	-	441	438	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1074	-	-	944	-	-	124	167	503	129	161	589
Mov Cap-2 Maneuver	-	-	-	-	-	-	124	167	-	129	161	-
Stage 1	-	-	-	-	-	-	418	425	-	511	512	-
Stage 2	-	-	-	-	-	-	443	505	-	366	409	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.6			0.5			71.2			26.2		
HCM LOS							F			D		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	179	1074	-	-	944	-	-	265				
HCM Lane V/C Ratio	0.767	0.045	-	-	0.029	-	-	0.364				
HCM Control Delay (s)	71.2	8.5	-	-	8.9	-	-	26.2				
HCM Lane LOS	F	A	-	-	A	-	-	D				
HCM 95th %tile Q(veh)	5	0.1	-	-	0.1	-	-	1.6				

HCM 6th Signalized Intersection Summary 3: Range Ave & W Steele Ln

Lance Drive Residential TIA
Cumulative Plus Project AM (120 Seconds)











												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	491	61	60	320	50	50	210	30	40	180	40
Future Volume (veh/h)	50	491	61	60	320	50	50	210	30	40	180	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.95	1.00		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	57	558	67	68	364	55	57	239	20	45	205	23
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	700	1209	145	544	1169	177	73	420	35	58	403	45
Arrive On Green	0.74	0.74	0.74	0.74	0.74	0.74	0.04	0.13	0.13	0.03	0.13	0.13
Sat Flow, veh/h	959	1624	195	793	1571	237	1767	3282	272	1767	3180	351
Grp Volume(v), veh/h	57	0	625	68	0	419	57	127	132	45	112	116
Grp Sat Flow(s),veh/h/ln	959	0	1819	793	0	1808	1767	1763	1791	1767	1763	1768
Q Serve(g_s), s	2.5	0.0	16.1	4.4	0.0	9.3	3.8	8.1	8.3	3.0	7.1	7.3
Cycle Q Clear(g_c), s	11.8	0.0	16.1	20.4	0.0	9.3	3.8	8.1	8.3	3.0	7.1	7.3
Prop In Lane	1.00		0.11	1.00		0.13	1.00		0.15	1.00		0.20
Lane Grp Cap(c), veh/h	700	0	1354	544	0	1346	73	226	229	58	223	224
V/C Ratio(X)	0.08	0.00	0.46	0.12	0.00	0.31	0.78	0.56	0.57	0.78	0.50	0.52
Avail Cap(c_a), veh/h	700	0	1354	544	0	1346	162	413	419	147	398	399
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.80	0.80	0.80	1.00	1.00	1.00
Uniform Delay (d), s/veh	7.1	0.0	6.0	10.0	0.0	5.1	57.0	49.2	49.2	57.6	48.9	49.0
Incr Delay (d2), s/veh	0.2	0.0	1.1	0.5	0.0	0.6	5.3	0.7	0.7	8.2	0.6	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	5.6	0.8	0.0	3.2	1.8	3.6	3.7	1.5	3.1	3.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	7.3	0.0	7.1	10.4	0.0	5.7	62.3	49.8	49.9	65.8	49.5	49.6
LnGrp LOS	A	A	A	B	A	A	E	D	D	E	D	D
Approach Vol, veh/h		682			487			316			273	
Approach Delay, s/veh		7.1			6.4			52.1			52.3	
Approach LOS		A			A			D			D	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		92.9	8.0	19.1		92.9	7.8	19.3				
Change Period (Y+Rc), s		3.6	3.0	3.9		3.6	3.9	* 3.9				
Max Green Setting (Gmax), s		71.4	11.0	27.1		71.4	10.0	* 28				
Max Q Clear Time (g_c+I1), s		18.1	5.8	9.3		22.4	5.0	10.3				
Green Ext Time (p_c), s		1.5	0.0	0.3		1.1	0.0	0.4				
Intersection Summary												
HCM 6th Ctrl Delay			22.0									
HCM 6th LOS			C									
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

HCM 6th Signalized Intersection Summary

4: Marlow Rd & Guerneville Rd

Lance Drive Residential TIA
Cumulative Plus Project AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	140	538	170	198	342	111	150	560	210	141	590	100
Future Volume (veh/h)	140	538	170	198	342	111	150	560	210	141	590	100
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No				No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	152	585	119	215	372	95	163	609	105	153	641	96
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	180	708	483	243	668	169	192	736	538	245	733	110
Arrive On Green	0.10	0.20	0.20	0.14	0.24	0.24	0.11	0.21	0.21	0.05	0.08	0.08
Sat Flow, veh/h	1767	3526	1558	1767	2784	702	1767	3526	1541	1767	3066	458
Grp Volume(v), veh/h	152	585	119	215	234	233	163	609	105	153	368	369
Grp Sat Flow(s),veh/h/ln	1767	1763	1558	1767	1763	1723	1767	1763	1541	1767	1763	1762
Q Serve(g_s), s	10.1	19.1	2.8	14.3	14.0	14.3	10.9	19.8	0.0	10.2	24.8	24.9
Cycle Q Clear(g_c), s	10.1	19.1	2.8	14.3	14.0	14.3	10.9	19.8	0.0	10.2	24.8	24.9
Prop In Lane	1.00		1.00	1.00		0.41	1.00		1.00	1.00		0.26
Lane Grp Cap(c), veh/h	180	708	483	243	423	413	192	736	538	245	422	421
V/C Ratio(X)	0.85	0.83	0.25	0.88	0.55	0.56	0.85	0.83	0.20	0.62	0.87	0.88
Avail Cap(c_a), veh/h	246	861	551	290	474	464	275	961	636	246	451	451
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	0.98	0.98	0.98	0.44	0.44	0.44	0.90	0.90	0.90
Uniform Delay (d), s/veh	53.0	45.9	7.4	50.8	40.0	40.1	52.5	45.4	27.5	54.2	53.5	53.5
Incr Delay (d2), s/veh	17.5	5.6	0.3	22.9	5.0	5.4	7.6	2.1	0.1	4.4	14.9	15.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.3	8.7	1.7	7.8	6.5	6.5	5.1	8.7	2.1	5.1	13.5	13.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	70.5	51.6	7.7	73.7	45.0	45.4	60.2	47.5	27.5	58.5	68.4	68.7
LnGrp LOS	E	D	A	E	D	D	E	D	C	E	E	E
Approach Vol, veh/h	856		682				877			890		
Approach Delay, s/veh	48.8		54.2				47.5			66.8		
Approach LOS	D		D				D			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	22.2	29.8	18.3	34.0	17.5	34.5	21.9	30.4				
Change Period (Y+Rc), s	5.7	* 5.7	5.3	5.3	5.3	5.7	5.3	5.3				
Max Green Setting (Gmax), s	29.8	* 29	18.7	30.7	16.7	32.3	16.7	32.7				
Max Q Clear Time (g_c+I1), s	11.3	21.1	12.9	26.9	12.1	16.3	12.2	21.8				
Green Ext Time (p_c), s	0.2	2.6	0.2	1.6	0.1	2.3	0.1	3.2				

Intersection Summary

HCM 6th Ctrl Delay 54.4

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary 5: Ridley Ave & Guerneville Rd

Lance Drive Residential TIA
Cumulative Plus Project AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	829	30	76	571	20	50	10	72	40	10	30
Future Volume (veh/h)	30	829	30	76	571	20	50	10	72	40	10	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	0.98		0.97	0.99		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	34	931	33	85	642	21	56	11	33	45	11	9
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	669	2892	103	506	2903	95	130	31	56	154	37	22
Arrive On Green	0.83	0.83	0.83	0.83	0.83	0.83	0.11	0.11	0.11	0.11	0.11	0.11
Sat Flow, veh/h	765	3470	123	578	3483	114	761	288	517	944	336	206
Grp Volume(v), veh/h	34	473	491	85	325	338	100	0	0	65	0	0
Grp Sat Flow(s), veh/h/ln	765	1763	1830	578	1763	1834	1566	0	0	1487	0	0
Q Serve(g_s), s	1.1	7.3	7.3	4.7	4.5	4.5	2.2	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	5.7	7.3	7.3	12.0	4.5	4.5	6.8	0.0	0.0	4.7	0.0	0.0
Prop In Lane	1.00		0.07	1.00		0.06	0.56		0.33	0.69		0.14
Lane Grp Cap(c), veh/h	669	1469	1525	506	1469	1529	217	0	0	213	0	0
V/C Ratio(X)	0.05	0.32	0.32	0.17	0.22	0.22	0.46	0.00	0.00	0.31	0.00	0.00
Avail Cap(c_a), veh/h	669	1469	1525	506	1469	1529	531	0	0	521	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.85	0.85	0.85	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	2.6	2.3	2.3	3.6	2.0	2.0	50.5	0.0	0.0	49.6	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.5	0.5	0.1	0.0	0.0	0.6	0.0	0.0	0.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln0.1	1.6	1.7	0.4	0.9	0.9	2.9	0.0	0.0	1.9	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	2.7	2.8	2.7	3.7	2.1	2.1	51.1	0.0	0.0	49.9	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	D	A	A	D	A	A
Approach Vol, veh/h	998			748			100			65		
Approach Delay, s/veh	2.8			2.3			51.1			49.9		
Approach LOS	A			A			D			D		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	103.9			16.1			103.9			16.1		
Change Period (Y+Rc), s	3.9			3.0			3.9			3.0		
Max Green Setting (Gmax), s	74.1			39.0			74.1			39.0		
Max Q Clear Time (g_c+I1), s	9.3			6.7			14.0			8.8		
Green Ext Time (p_c), s	2.0			0.2			1.7			0.3		

Intersection Summary

HCM 6th Ctrl Delay	6.7
HCM 6th LOS	A

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

6: Lance Dr & Guerneville Rd

Lance Drive Residential TIA
Cumulative Plus Project AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	48	866	30	30	526	99	20	64	80	178	112	119
Future Volume (veh/h)	48	866	30	30	526	99	20	64	80	178	112	119
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	57	1031	35	36	626	98	24	76	59	212	133	127
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	75	1106	38	72	1116	486	91	277	197	252	132	125
Arrive On Green	0.01	0.11	0.11	0.01	0.10	0.10	0.33	0.33	0.33	0.33	0.33	0.33
Sat Flow, veh/h	1767	3476	118	1767	3526	1537	172	844	599	636	402	382
Grp Volume(v), veh/h	57	523	543	36	626	98	159	0	0	472	0	0
Grp Sat Flow(s), veh/h/ln	1767	1763	1831	1767	1763	1537	1615	0	0	1420	0	0
Q Serve(g_s), s	3.9	35.3	35.3	2.4	20.3	7.0	0.0	0.0	0.0	31.3	0.0	0.0
Cycle Q Clear(g_c), s	3.9	35.3	35.3	2.4	20.3	7.0	8.1	0.0	0.0	39.4	0.0	0.0
Prop In Lane	1.00		0.06	1.00		1.00	0.15		0.37	0.45		0.27
Lane Grp Cap(c), veh/h	75	561	583	72	1116	486	565	0	0	510	0	0
V/C Ratio(X)	0.76	0.93	0.93	0.50	0.56	0.20	0.28	0.00	0.00	0.93	0.00	0.00
Avail Cap(c_a), veh/h	143	804	835	158	1636	713	565	0	0	510	0	0
HCM Platoon Ratio	0.33	0.33	0.33	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.96	0.96	0.96	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	58.5	52.4	52.4	58.0	45.8	39.9	29.8	0.0	0.0	41.0	0.0	0.0
Incr Delay (d2), s/veh	5.7	11.4	11.1	1.9	2.0	0.9	0.1	0.0	0.0	22.7	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	18.4	19.1	1.1	9.9	2.8	3.5	0.0	0.0	17.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	64.3	63.8	63.5	59.9	47.8	40.8	29.9	0.0	0.0	63.7	0.0	0.0
LnGrp LOS	E	E	E	E	D	D	C	A	A	E	A	A
Approach Vol, veh/h	1123			760			159			472		
Approach Delay, s/veh	63.7			47.4			29.9			63.7		
Approach LOS	E			D			C			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	40.2	43.5		44.0	10.4	43.3		44.0				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		4.6				
Max Green Setting (Gmax), s	40.2	54.7		39.4	9.7	55.7		39.4				
Max Q Clear Time (g_c+14.4), s	14.4	37.3		41.4	5.9	22.3		10.1				
Green Ext Time (p_c), s	0.0	0.9		0.0	0.0	0.7		0.2				

Intersection Summary

HCM 6th Ctrl Delay 56.6

HCM 6th LOS E

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

7: N Dutton Ave/Westberry Dr & Guerneville Rd

Lance Drive Residential TIA
Cumulative Plus Project AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	1069	155	290	572	10	113	10	440	30	10	10
Future Volume (veh/h)	10	1069	155	290	572	10	113	10	440	30	10	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	12	1288	181	349	689	11	145	0	219	36	12	1
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	29	1172	164	1179	2505	40	202	0	630	65	22	2
Arrive On Green	0.02	0.38	0.38	0.69	1.00	1.00	0.06	0.00	0.06	0.05	0.05	0.05
Sat Flow, veh/h	1767	3099	432	3428	3550	57	3534	0	1564	1310	437	36
Grp Volume(v), veh/h	12	729	740	349	342	358	145	0	219	49	0	0
Grp Sat Flow(s), veh/h/ln	1767	1763	1768	1714	1763	1844	1767	0	1564	1782	0	0
Q Serve(g_s), s	0.8	45.4	45.4	4.8	0.0	0.0	4.8	0.0	0.0	3.2	0.0	0.0
Cycle Q Clear(g_c), s	0.8	45.4	45.4	4.8	0.0	0.0	4.8	0.0	0.0	3.2	0.0	0.0
Prop In Lane	1.00		0.24	1.00		0.03	1.00		1.00	0.73		0.02
Lane Grp Cap(c), veh/h	29	667	669	1179	1244	1301	202	0	630	89	0	0
V/C Ratio(X)	0.41	1.09	1.11	0.30	0.27	0.28	0.72	0.00	0.35	0.55	0.00	0.00
Avail Cap(c_a), veh/h	90	667	669	1179	1244	1301	265	0	658	377	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.79	0.79	0.79	0.90	0.90	0.90	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	58.4	37.3	37.3	13.0	0.0	0.0	55.6	0.0	25.0	55.7	0.0	0.0
Incr Delay (d2), s/veh	2.7	59.4	64.3	0.0	0.5	0.5	3.7	0.0	0.1	2.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	29.6	30.6	1.6	0.2	0.2	2.2	0.0	4.2	1.5	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.1	96.7	101.6	13.1	0.5	0.5	59.3	0.0	25.1	57.7	0.0	0.0
LnGrp LOS	E	F	F	B	A	A	E	A	C	E	A	A
Approach Vol, veh/h	1481			1049			364			49		
Approach Delay, s/veh	98.9			4.7			38.7			57.7		
Approach LOS	F			A			D			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	46.6	50.7		10.6	7.3	90.0		12.2				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		5.3				
Max Green Setting (Gmax), s	45.4	45.4		25.4	6.1	59.0		9.0				
Max Q Clear Time (g_c+I10), s	47.4	47.4		5.2	2.8	2.0		6.8				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	0.5		0.0				

Intersection Summary

HCM 6th Ctrl Delay 57.2

HCM 6th LOS E

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 8: Herbert St/Coffey Ln & Guerneville Rd

Lance Drive Residential TIA
Cumulative Plus Project AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	150	1339	40	30	652	50	30	20	20	90	10	180
Future Volume (veh/h)	150	1339	40	30	652	50	30	20	20	90	10	180
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		0.95	1.00		0.94	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	174	1557	46	35	758	55	35	23	6	105	12	62
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	197	1277	38	534	1847	134	64	42	11	156	18	324
Arrive On Green	0.22	0.73	0.73	0.60	1.00	1.00	0.07	0.07	0.07	0.10	0.10	0.10
Sat Flow, veh/h	1767	3491	103	1767	3321	241	965	634	165	1594	182	1513
Grp Volume(v), veh/h	174	784	819	35	402	411	64	0	0	117	0	62
Grp Sat Flow(s), veh/h/ln	1767	1763	1831	1767	1763	1799	1765	0	0	1776	0	1513
Q Serve(g_s), s	11.4	43.9	43.9	1.0	0.0	0.0	4.2	0.0	0.0	7.6	0.0	4.1
Cycle Q Clear(g_c), s	11.4	43.9	43.9	1.0	0.0	0.0	4.2	0.0	0.0	7.6	0.0	4.1
Prop In Lane	1.00		0.06	1.00		0.13	0.55		0.09	0.90		1.00
Lane Grp Cap(c), veh/h	197	645	670	534	980	1000	118	0	0	174	0	324
V/C Ratio(X)	0.88	1.22	1.22	0.07	0.41	0.41	0.54	0.00	0.00	0.67	0.00	0.19
Avail Cap(c_a), veh/h	199	645	670	534	980	1000	368	0	0	385	0	503
HCM Platoon Ratio	2.00	2.00	2.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.51	0.51	0.51	0.89	0.89	0.89	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	45.8	16.1	16.1	16.8	0.0	0.0	54.2	0.0	0.0	52.2	0.0	39.1
Incr Delay (d2), s/veh	19.6	104.6	107.2	0.0	1.1	1.1	1.4	0.0	0.0	1.7	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.4	24.5	25.9	0.4	0.3	0.3	1.9	0.0	0.0	3.5	0.0	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	65.5	120.7	123.3	16.8	1.1	1.1	55.7	0.0	0.0	53.9	0.0	39.2
LnGrp LOS	E	F	F	B	A	A	E	A	A	D	A	D
Approach Vol, veh/h	1777			848			64			179		
Approach Delay, s/veh	116.5			1.8			55.7			48.8		
Approach LOS	F			A			E			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	41.5	49.2		16.7	18.7	72.0		12.6				
Change Period (Y+Rc), s	5.3	5.3		4.9	5.3	5.3		4.6				
Max Green Setting (Gmax), s	5.0	43.9		26.0	13.5	35.4		25.0				
Max Q Clear Time (g_c+11.0), s	5.0	45.9		9.6	13.4	2.0		6.2				
Green Ext Time (p_c), s	0.0	0.0		0.1	0.0	0.7		0.1				

Intersection Summary

HCM 6th Ctrl Delay	77.0
HCM 6th LOS	E

HCM 6th Signalized Intersection Summary

9: Range Ave & Guerneville Rd

Lance Drive Residential TIA
Cumulative Plus Project AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	170	897	182	90	501	10	161	110	90	41	120	130
Future Volume (veh/h)	170	897	182	90	501	10	161	110	90	41	120	130
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.96	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	181	954	0	96	533	0	102	213	19	44	128	29
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	298	997		119	640		152	288	25	112	181	40
Arrive On Green	0.34	0.57	0.00	0.07	0.18	0.00	0.09	0.09	0.09	0.02	0.02	0.02
Sat Flow, veh/h	1767	3618	0	1767	3618	0	1767	3349	295	1767	2847	622
Grp Volume(v), veh/h	181	954	0	96	533	0	102	117	115	44	77	80
Grp Sat Flow(s), veh/h/ln	1767	1763	0	1767	1763	0	1767	1856	1788	1767	1763	1707
Q Serve(g_s), s	10.2	30.8	0.0	6.4	17.5	0.0	6.7	7.4	7.5	2.9	5.2	5.6
Cycle Q Clear(g_c), s	10.2	30.8	0.0	6.4	17.5	0.0	6.7	7.4	7.5	2.9	5.2	5.6
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.17	1.00		0.36
Lane Grp Cap(c), veh/h	298	997		119	640		152	160	154	112	112	108
V/C Ratio(X)	0.61	0.96		0.81	0.83		0.67	0.73	0.75	0.39	0.69	0.73
Avail Cap(c_a), veh/h	437	1548		246	1166		227	238	230	216	216	209
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	0.63	0.63	0.00	0.95	0.95	0.00	1.00	1.00	1.00	0.79	0.79	0.79
Uniform Delay (d), s/veh	36.5	25.4	0.0	55.2	47.3	0.0	53.2	53.5	53.6	56.5	57.6	57.7
Incr Delay (d2), s/veh	0.5	5.7	0.0	4.5	11.5	0.0	1.9	2.4	2.8	0.7	2.2	2.8
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	8.9	0.0	3.0	8.6	0.0	3.1	3.5	3.5	1.3	2.4	2.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	36.9	31.1	0.0	59.7	58.9	0.0	55.1	55.9	56.4	57.1	59.8	60.6
LnGrp LOS	D	C		E	E		E	E	E	E	E	E
Approach Vol, veh/h	1135		A	629		A	334			201		
Approach Delay, s/veh	32.0			59.0			55.8			59.5		
Approach LOS	C			E			E			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	3.4	39.2		12.9	25.5	27.1		14.9				
Change Period (Y+Rc), s	5.3	5.3		5.3	5.3	5.3		4.6				
Max Green Setting (Gmax), s	6.3	52.7		14.7	29.7	39.7		15.4				
Max Q Clear Time (g_c+1.0), s	13.4	32.8		7.6	12.2	19.5		9.5				
Green Ext Time (p_c), s	0.0	1.2		0.1	0.0	0.7		0.1				

Intersection Summary

HCM 6th Ctrl Delay 45.3
HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.













Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

10: Guerneville Rd & Steele Wy

Lance Drive Residential TIA
Cumulative Plus Project AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	946	52	70	550	10	31	20	70	461	20	20
Future Volume (veh/h)	30	946	52	70	550	10	31	20	70	461	20	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	34	1075	39	80	625	10	29	31	18	540	0	17
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	733	1946	961	200	694	11	106	111	185	598	0	917
Arrive On Green	0.41	0.55	0.55	0.06	0.20	0.20	0.06	0.06	0.06	0.17	0.00	0.17
Sat Flow, veh/h	1767	3526	1571	3428	3549	57	1767	1856	1557	3534	0	1567
Grp Volume(v), veh/h	34	1075	39	80	310	325	29	31	18	540	0	17
Grp Sat Flow(s),veh/h/ln	1767	1763	1571	1714	1763	1843	1767	1856	1557	1767	0	1567
Q Serve(g_s), s	1.4	23.6	1.2	2.7	20.6	20.6	1.9	1.9	1.2	18.0	0.0	0.0
Cycle Q Clear(g_c), s	1.4	23.6	1.2	2.7	20.6	20.6	1.9	1.9	1.2	18.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.03	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	733	1946	961	200	344	360	106	111	185	598	0	917
V/C Ratio(X)	0.05	0.55	0.04	0.40	0.90	0.90	0.27	0.28	0.10	0.90	0.00	0.02
Avail Cap(c_a), veh/h	733	1946	961	203	580	607	398	417	442	798	0	1006
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.80	0.80	0.80	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	20.9	17.3	9.3	54.5	47.1	47.2	53.9	53.9	47.2	48.9	0.0	10.5
Incr Delay (d2), s/veh	0.0	0.9	0.1	0.5	6.0	5.8	0.5	0.5	0.1	9.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	9.4	0.5	1.2	9.5	9.9	0.9	0.9	0.5	8.7	0.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.9	18.2	9.3	55.0	53.2	53.0	54.4	54.5	47.3	58.3	0.0	10.5
LnGrp LOS	C	B	A	D	D	D	D	D	D	E	A	B
Approach Vol, veh/h	1148					715				78	557	
Approach Delay, s/veh	18.0					53.3				52.8	56.8	
Approach LOS	B					D				D	E	
Timer - Assigned Phs	1	2	4		5	6	8					
Phs Duration (G+Y+Rc), s	1.9	71.1	25.2		54.7	28.3	11.8					
Change Period (Y+Rc), s	4.9	4.9	4.9		4.9	4.9	4.6					
Max Green Setting (Gmax),s	39.5		27.1		7.1	39.5	27.0					
Max Q Clear Time (g_c+14),s	25.6		20.0		3.4	22.6	3.9					
Green Ext Time (p_c), s	0.0	1.5	0.1		0.0	0.6	0.0					

Intersection Summary

HCM 6th Ctrl Delay 37.8

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

11: Cleveland Ave & Guerneville Rd

Lance Drive Residential TIA
Cumulative Plus Project AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰ ↱	↑ ↑		↰ ↱	↑ ↑	↱	↰	↑ ↑		↰ ↱	↰ ↱	
Traffic Volume (veh/h)	70	1407	40	210	990	230	40	110	170	270	80	50
Future Volume (veh/h)	70	1407	40	210	990	230	40	110	170	270	80	50
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	77	1546	41	231	1088	153	44	121	80	297	88	39
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	272	1644	44	285	1156	505	562	663	406	394	135	60
Arrive On Green	0.08	0.32	0.32	0.08	0.33	0.33	0.32	0.32	0.32	0.11	0.11	0.11
Sat Flow, veh/h	3428	5071	134	3428	3526	1538	1767	2084	1276	3534	1212	537
Grp Volume(v), veh/h	77	1030	557	231	1088	153	44	101	100	297	0	127
Grp Sat Flow(s), veh/h/ln	1714	1689	1828	1714	1763	1538	1767	1763	1598	1767	0	1748
Q Serve(g_s), s	2.5	35.6	35.6	8.0	36.0	8.9	2.1	5.0	5.5	9.8	0.0	8.4
Cycle Q Clear(g_c), s	2.5	35.6	35.6	8.0	36.0	8.9	2.1	5.0	5.5	9.8	0.0	8.4
Prop In Lane	1.00		0.07	1.00		1.00	1.00		0.80	1.00		0.31
Lane Grp Cap(c), veh/h	272	1095	593	285	1156	505	562	561	508	394	0	195
V/C Ratio(X)	0.28	0.94	0.94	0.81	0.94	0.30	0.08	0.18	0.20	0.75	0.00	0.65
Avail Cap(c_a), veh/h	272	1185	641	374	1413	617	562	561	508	857	0	424
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.69	0.69	0.69	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	52.0	39.4	39.4	54.1	39.2	30.1	28.6	29.6	29.8	51.7	0.0	51.1
Incr Delay (d2), s/veh	0.2	13.2	20.6	5.2	7.7	0.1	0.3	0.7	0.9	1.1	0.0	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	16.4	19.0	3.6	16.4	3.3	0.9	2.2	2.2	4.4	0.0	3.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	52.3	52.6	60.1	59.3	46.9	30.2	28.9	30.3	30.6	52.8	0.0	52.4
LnGrp LOS	D	D	E	E	D	C	C	C	C	D	A	D
Approach Vol, veh/h	1664			1472			245			424		
Approach Delay, s/veh	55.1			47.1			30.2			52.7		
Approach LOS	E			D			C			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.9	43.8		43.1	14.4	44.3		18.3				
Change Period (Y+Rc), s	4.9	4.9		4.9	4.9	4.9		4.9				
Max Green Setting (Gmax), s	42.1			16.1	7.1	48.1		29.1				
Max Q Clear Time (g_c+110, s)	37.6			7.5	4.5	38.0		11.8				
Green Ext Time (p_c), s	0.0	1.3		0.1	0.0	1.4		0.1				

Intersection Summary

HCM 6th Ctrl Delay 50.1

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 12: US 101 SB Ramps & Guerneville Rd

Lance Drive Residential TIA
Cumulative Plus Project AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑					↑	↑	↑
Traffic Volume (veh/h)	0	1244	603	310	1082	0	0	0	0	420	10	338
Future Volume (veh/h)	0	1244	603	310	1082	0	0	0	0	420	10	338
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1856	1856	1856	1856	0				1856	1856	1856
Adj Flow Rate, veh/h	0	1398	268	348	1216	0				480	0	323
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89				0.89	0.89	0.89
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	1521	464	400	1614	0				1636	0	728
Arrive On Green	0.00	0.30	0.30	0.12	0.46	0.00				0.46	0.00	0.46
Sat Flow, veh/h	0	5233	1545	3428	3618	0				3534	0	1572
Grp Volume(v), veh/h	0	1398	268	348	1216	0				480	0	323
Grp Sat Flow(s),veh/h/ln	0	1689	1545	1714	1763	0				1767	0	1572
Q Serve(g_s), s	0.0	32.0	17.6	12.0	34.3	0.0				10.1	0.0	16.7
Cycle Q Clear(g_c), s	0.0	32.0	17.6	12.0	34.3	0.0				10.1	0.0	16.7
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1521	464	400	1614	0				1636	0	728
V/C Ratio(X)	0.00	0.92	0.58	0.87	0.75	0.00				0.29	0.00	0.44
Avail Cap(c_a), veh/h	0	2030	619	546	2118	0				1636	0	728
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.25	0.25	0.70	0.70	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	40.6	35.5	52.1	26.9	0.0				20.0	0.0	21.8
Incr Delay (d2), s/veh	0.0	1.4	0.1	6.3	0.5	0.0				0.5	0.0	2.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	13.2	6.6	5.4	14.0	0.0				4.1	0.0	6.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	42.0	35.6	58.4	27.4	0.0				20.5	0.0	23.7
LnGrp LOS	A	D	D	E	C	A				C	A	C
Approach Vol, veh/h		1666			1564						803	
Approach Delay, s/veh		40.9			34.3						21.8	
Approach LOS		D			C						C	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	48.9	40.9		60.2		59.8						
Change Period (Y+Rc), s	4.9	4.9		4.6		4.9						
Max Green Setting (Gmax), s	48.1			38.4		72.1						
Max Q Clear Time (g_c+I14), s	34.0			18.7		36.3						
Green Ext Time (p_c), s	0.0	2.0		0.1		1.8						

Intersection Summary

HCM 6th Ctrl Delay 34.6
HCM 6th LOS C

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 13: US 101 NB Ramps & Guerneville Rd/Steele Ln

Lance Drive Residential TIA
Cumulative Plus Project AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↑↑			↑↑↑		↰	↰↱	↱			
Traffic Volume (veh/h)	473	1191	0	0	953	250	439	10	500	0	0	0
Future Volume (veh/h)	473	1191	0	0	953	250	439	10	500	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1856	1856	0	0	1856	1856	1856	1856	1856			
Adj Flow Rate, veh/h	531	1338	0	0	1071	252	632	0	291			
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89			
Percent Heavy Veh, %	3	3	0	0	3	3	3	3	3			
Cap, veh/h	1357	2544	0	0	1161	273	704	0	313			
Arrive On Green	0.79	1.00	0.00	0.00	0.28	0.28	0.20	0.00	0.20			
Sat Flow, veh/h	3428	3618	0	0	4242	958	3534	0	1572			
Grp Volume(v), veh/h	531	1338	0	0	887	436	632	0	291			
Grp Sat Flow(s),veh/h/ln	1714	1763	0	0	1689	1656	1767	0	1572			
Q Serve(g_s), s	5.6	0.0	0.0	0.0	30.6	30.6	20.9	0.0	21.8			
Cycle Q Clear(g_c), s	5.6	0.0	0.0	0.0	30.6	30.6	20.9	0.0	21.8			
Prop In Lane	1.00		0.00	0.00		0.58	1.00		1.00			
Lane Grp Cap(c), veh/h	1357	2544	0	0	962	472	704	0	313			
V/C Ratio(X)	0.39	0.53	0.00	0.00	0.92	0.92	0.90	0.00	0.93			
Avail Cap(c_a), veh/h	1357	2544	0	0	1185	581	1160	0	516			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.53	0.53	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	8.1	0.0	0.0	0.0	41.6	41.6	46.8	0.0	47.2			
Incr Delay (d2), s/veh	0.0	0.4	0.0	0.0	9.4	16.7	3.4	0.0	11.0			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	1.7	0.1	0.0	0.0	13.7	14.4	9.2	0.0	9.2			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	8.2	0.4	0.0	0.0	51.0	58.3	50.2	0.0	58.2			
LnGrp LOS	A	A	A	A	D	E	D	A	E			
Approach Vol, veh/h	1869			1323			923					
Approach Delay, s/veh	2.6			53.4			52.7					
Approach LOS	A			D			D					
Timer - Assigned Phs	2			5			6			8		
Phs Duration (G+Y+Rc), s	91.5			52.4			39.1			28.5		
Change Period (Y+Rc), s	4.9			4.9			4.9			4.6		
Max Green Setting (Gmax), s	71.1			24.1			42.1			39.4		
Max Q Clear Time (g_c+I1), s	2.0			7.6			32.6			23.8		
Green Ext Time (p_c), s	2.1			0.1			1.6			0.1		

Intersection Summary

HCM 6th Ctrl Delay	30.2
HCM 6th LOS	C










Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 14: Stony Point Rd/Marlow Rd & W College Ave

Lance Drive Residential TIA
Cumulative Plus Project AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	94	410	170	185	220	150	90	696	192	200	677	81
Future Volume (veh/h)	94	410	170	185	220	150	90	696	192	200	677	81
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	104	456	151	206	244	73	100	773	130	222	752	83
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	332	521	171	423	678	198	124	850	748	251	999	110
Arrive On Green	0.19	0.20	0.20	0.24	0.25	0.25	0.07	0.24	0.24	0.14	0.31	0.31
Sat Flow, veh/h	1767	2594	851	1767	2687	785	1767	3526	1539	1767	3194	352
Grp Volume(v), veh/h	104	309	298	206	158	159	100	773	130	222	415	420
Grp Sat Flow(s),veh/h/ln	1767	1763	1683	1767	1763	1710	1767	1763	1539	1767	1763	1784
Q Serve(g_s), s	6.1	20.3	20.7	12.0	8.8	9.2	6.7	25.6	2.7	14.8	25.4	25.4
Cycle Q Clear(g_c), s	6.1	20.3	20.7	12.0	8.8	9.2	6.7	25.6	2.7	14.8	25.4	25.4
Prop In Lane	1.00		0.51	1.00		0.46	1.00		1.00	1.00		0.20
Lane Grp Cap(c), veh/h	332	354	338	423	445	431	124	850	748	251	551	558
V/C Ratio(X)	0.31	0.87	0.88	0.49	0.36	0.37	0.80	0.91	0.17	0.89	0.75	0.75
Avail Cap(c_a), veh/h	332	383	366	423	504	489	180	887	764	314	577	584
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.38	0.38	0.38	1.00	1.00	1.00	0.55	0.55	0.55
Uniform Delay (d), s/veh	42.0	46.4	46.6	39.3	36.8	37.0	55.0	44.3	6.2	50.5	37.1	37.1
Incr Delay (d2), s/veh	0.5	18.2	20.5	0.3	0.2	0.2	15.5	12.9	0.1	13.2	3.0	3.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	10.5	10.4	5.2	3.8	3.8	3.5	12.4	1.1	7.3	11.1	11.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.6	64.6	67.1	39.6	37.0	37.2	70.4	57.1	6.3	63.7	40.0	40.0
LnGrp LOS	D	E	E	D	D	D	E	E	A	E	D	D
Approach Vol, veh/h	711		523			1003			1057			
Approach Delay, s/veh	62.4		38.1			51.9			45.0			
Approach LOS	E		D			D			D			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	34.0	29.4	13.7	42.8	27.8	35.6	22.3	34.2				
Change Period (Y+Rc), s	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3				
Max Green Setting (Gmax), s	11.8	26.1	12.2	39.3	13.0	34.3	21.3	30.2				
Max Q Clear Time (g_c+14.0), s	11.8	22.7	8.7	27.4	8.1	11.2	16.8	27.6				
Green Ext Time (p_c), s	0.3	1.2	0.1	3.9	0.1	1.7	0.2	1.4				

Intersection Summary

HCM 6th Ctrl Delay 49.8

HCM 6th LOS D

Notes









User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

15: N Dutton Ave & W College Ave

Lance Drive Residential TIA
Cumulative Plus Project AM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	110	810	110	100	610	337	90	428	120	249	272	60
Future Volume (veh/h)	110	810	110	100	610	337	90	428	120	249	272	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	118	871	107	108	656	297	97	460	106	268	292	41
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	143	938	115	134	705	319	432	517	118	570	806	112
Arrive On Green	0.08	0.30	0.30	0.08	0.30	0.30	0.24	0.18	0.18	0.32	0.26	0.26
Sat Flow, veh/h	1767	3152	387	1767	2354	1066	1767	2836	649	1767	3101	430
Grp Volume(v), veh/h	118	487	491	108	491	462	97	285	281	268	165	168
Grp Sat Flow(s),veh/h/ln	1767	1763	1777	1767	1763	1657	1767	1763	1722	1767	1763	1768
Q Serve(g_s), s	7.9	32.2	32.2	7.2	32.5	32.5	5.3	18.9	19.2	14.5	9.1	9.4
Cycle Q Clear(g_c), s	7.9	32.2	32.2	7.2	32.5	32.5	5.3	18.9	19.2	14.5	9.1	9.4
Prop In Lane	1.00		0.22	1.00		0.64	1.00		0.38	1.00		0.24
Lane Grp Cap(c), veh/h	143	524	529	134	528	497	432	321	314	570	458	460
V/C Ratio(X)	0.83	0.93	0.93	0.81	0.93	0.93	0.22	0.89	0.90	0.47	0.36	0.37
Avail Cap(c_a), veh/h	177	604	609	177	604	568	432	383	375	570	574	576
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.58	0.58	0.58	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.3	40.9	40.9	54.6	40.8	40.8	36.2	47.9	48.0	32.5	36.2	36.3
Incr Delay (d2), s/veh	11.7	12.2	12.1	13.9	18.7	19.5	0.1	17.2	19.3	0.2	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.9	15.4	15.6	3.7	16.5	15.7	2.3	9.7	9.8	6.1	3.9	4.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	66.0	53.1	53.0	68.6	59.5	60.3	36.3	65.1	67.2	32.7	36.4	36.5
LnGrp LOS	E	D	D	E	E	E	D	E	E	C	D	D
Approach Vol, veh/h	1096				1061		663				601	
Approach Delay, s/veh	54.4				60.8		61.8				34.8	
Approach LOS	D				E		E				C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	3.0	39.6	32.4	35.1	12.7	39.9	41.7	25.8				
Change Period (Y+Rc), s	3.9	* 3.9	3.0	3.9	3.0	3.9	3.0	3.9				
Max Green Setting (Gmax), s	41.0	* 41	14.0	39.1	12.0	41.1	27.0	26.1				
Max Q Clear Time (g_c+19.2), s	34.2	34.2	7.3	11.4	9.9	34.5	16.5	21.2				
Green Ext Time (p_c), s	0.0	1.5	0.0	0.6	0.0	1.5	0.1	0.6				

Intersection Summary

HCM 6th Ctrl Delay 54.4

HCM 6th LOS D

Notes





User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection

Intersection Delay, s/veh 8.8

Intersection LOS A




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	8	72	0	20	32	69	0	8	55	116	2	3
Future Vol, veh/h	8	72	0	20	32	69	0	8	55	116	2	3
Peak Hour Factor	0.66	0.66	0.92	0.92	0.66	0.66	0.92	0.92	0.92	0.66	0.92	0.66
Heavy Vehicles, %	3	3	2	2	3	3	2	2	2	3	2	3
Mvmt Flow	12	109	0	22	48	105	0	9	60	176	2	5
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.7	8.6	7.8	9.5
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	10%	17%	96%
Vol Thru, %	13%	90%	26%	2%
Vol Right, %	87%	0%	57%	2%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	63	80	121	121
LT Vol	0	8	20	116
Through Vol	8	72	32	2
RT Vol	55	0	69	3
Lane Flow Rate	68	121	175	182
Geometry Grp	1	1	1	1
Degree of Util (X)	0.082	0.161	0.213	0.247
Departure Headway (Hd)	4.322	4.776	4.379	4.882
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	825	749	818	734
Service Time	2.369	2.814	2.414	2.923
HCM Lane V/C Ratio	0.082	0.162	0.214	0.248
HCM Control Delay	7.8	8.7	8.6	9.5
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.3	0.6	0.8	1




HCM 6th TWSC
17: Iroquois St & Project Driveway (1)

Lance Drive Residential TIA
Cumulative Plus Project AM (120 Seconds)

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	7	2	82	106	1
Future Vol, veh/h	2	7	2	82	106	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	8	2	89	115	1
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	209	116	116	0	-	0
Stage 1	116	-	-	-	-	-
Stage 2	93	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	779	936	1473	-	-	-
Stage 1	909	-	-	-	-	-
Stage 2	931	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	778	936	1473	-	-	-
Mov Cap-2 Maneuver	778	-	-	-	-	-
Stage 1	908	-	-	-	-	-
Stage 2	931	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	9.1	0.2		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1473	-	896	-	-	
HCM Lane V/C Ratio	0.001	-	0.011	-	-	
HCM Control Delay (s)	7.4	0	9.1	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	




HCM 6th TWSC
18: Iroquois St & Project Driveway (2)

Lance Drive Residential TIA
Cumulative Plus Project AM (120 Seconds)

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	8	3	82	113	0
Future Vol, veh/h	2	8	3	82	113	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	9	3	89	123	0
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	218	123	123	0	-	0
Stage 1	123	-	-	-	-	-
Stage 2	95	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	770	928	1464	-	-	-
Stage 1	902	-	-	-	-	-
Stage 2	929	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	768	928	1464	-	-	-
Mov Cap-2 Maneuver	768	-	-	-	-	-
Stage 1	900	-	-	-	-	-
Stage 2	929	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	9.1	0.3		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1464	-	891	-	-	
HCM Lane V/C Ratio	0.002	-	0.012	-	-	
HCM Control Delay (s)	7.5	0	9.1	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	

HCM 6th TWSC
19: Project Driveway (3) & Lance Dr

Lance Drive Residential TIA
Cumulative Plus Project AM (120 Seconds)

Intersection						
Int Delay, s/veh	1.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	232	1	14	107	4	37
Future Vol, veh/h	232	1	14	107	4	37
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	252	1	15	116	4	40
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	253	0	399	253
Stage 1	-	-	-	-	253	-
Stage 2	-	-	-	-	146	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1312	-	607	786
Stage 1	-	-	-	-	789	-
Stage 2	-	-	-	-	881	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1312	-	600	786
Mov Cap-2 Maneuver	-	-	-	-	600	-
Stage 1	-	-	-	-	789	-
Stage 2	-	-	-	-	870	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.9		10	
HCM LOS					B	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	763	-	-	1312	-	
HCM Lane V/C Ratio	0.058	-	-	0.012	-	
HCM Control Delay (s)	10	-	-	7.8	0	
HCM Lane LOS	B	-	-	A	A	
HCM 95th %tile Q(veh)	0.2	-	-	0	-	

HCM 6th TWSC
20: Guerneville Rd & Project Driveway (4)























Lance Drive Residential TIA
Cumulative Plus Project AM (120 Seconds)

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕↕	↕↕		↕	
Traffic Vol, veh/h	3	918	649	6	16	8
Future Vol, veh/h	3	918	649	6	16	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	998	705	7	17	9
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	712	0	-	0	1214	356
Stage 1	-	-	-	-	709	-
Stage 2	-	-	-	-	505	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	884	-	-	-	174	640
Stage 1	-	-	-	-	449	-
Stage 2	-	-	-	-	571	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	884	-	-	-	173	640
Mov Cap-2 Maneuver	-	-	-	-	173	-
Stage 1	-	-	-	-	445	-
Stage 2	-	-	-	-	571	-
Approach	EB	WB		SB		
HCM Control Delay, s	0	0		22.7		
HCM LOS				C		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	884	-	-	-	-	229
HCM Lane V/C Ratio	0.004	-	-	-	-	0.114
HCM Control Delay (s)	9.1	0	-	-	-	22.7
HCM Lane LOS	A	A	-	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	-	0.4

HCM 6th Signalized Intersection Summary







1: Marlow Rd & Marlow Ct/W Steele Ln

Lance Drive Residential TIA
Cumulative Plus Project AM (120-140 Seconds)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	10	10	260	10	220	10	601	260	164	580	10
Future Volume (veh/h)	10	10	10	260	10	220	10	601	260	164	580	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.94	1.00		1.00	1.00		0.96	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	12	12	2	311	0	166	12	699	209	191	674	11
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	31	31	5	1665	0	931	24	821	1092	217	1208	20
Arrive On Green	0.04	0.04	0.04	0.47	0.00	0.47	0.01	0.23	0.23	0.12	0.34	0.34
Sat Flow, veh/h	822	822	137	3534	0	1565	1767	3526	1506	1767	3549	58
Grp Volume(v), veh/h	26	0	0	311	0	166	12	699	209	191	335	350
Grp Sat Flow(s),veh/h/ln	1780	0	0	1767	0	1565	1767	1763	1506	1767	1763	1845
Q Serve(g_s), s	2.0	0.0	0.0	7.1	0.0	0.0	0.9	26.6	6.7	14.9	21.6	21.7
Cycle Q Clear(g_c), s	2.0	0.0	0.0	7.1	0.0	0.0	0.9	26.6	6.7	14.9	21.6	21.7
Prop In Lane	0.46		0.08	1.00		1.00	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	67	0	0	1665	0	931	24	821	1092	217	600	628
V/C Ratio(X)	0.39	0.00	0.00	0.19	0.00	0.18	0.51	0.85	0.19	0.88	0.56	0.56
Avail Cap(c_a), veh/h	243	0	0	1665	0	931	77	992	1165	329	744	779
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.54	0.54	0.54	1.00	1.00	1.00
Uniform Delay (d), s/veh	65.8	0.0	0.0	21.5	0.0	12.9	68.6	51.4	7.1	60.4	37.6	37.6
Incr Delay (d2), s/veh	3.7	0.0	0.0	0.2	0.0	0.4	8.9	3.5	0.0	15.9	0.8	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	0.0	3.1	0.0	2.5	0.5	12.1	6.5	7.6	9.4	9.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	69.5	0.0	0.0	21.7	0.0	13.3	77.5	54.8	7.2	76.3	38.4	38.4
LnGrp LOS	E	A	A	C	A	B	E	D	A	E	D	D
Approach Vol, veh/h		26			477			920			876	
Approach Delay, s/veh		69.5			18.8			44.3			46.7	
Approach LOS		E			B			D			D	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		70.6	6.8	52.5		10.1	22.1	37.2				
Change Period (Y+Rc), s		4.6	4.9	4.9		4.9	4.9	4.6				
Max Green Setting (Gmax), s		36.4	6.1	59.1		19.1	26.1	39.4				
Max Q Clear Time (g_c+I1), s		9.1	2.9	23.7		4.0	16.9	28.6				
Green Ext Time (p_c), s		1.7	0.0	4.5		0.1	0.3	4.0				
Intersection Summary												
HCM 6th Ctrl Delay				40.2								
HCM 6th LOS				D								
Notes												
User approved pedestrian interval to be less than phase max green.												
User approved volume balancing among the lanes for turning movement.												






















HCM 6th TWSC
2: Iroquois St/Apple Valley Ln & W Steele Ln

Lance Drive Residential TIA
Cumulative Plus Project AM (120-140 Seconds)

Intersection												
Int Delay, s/veh	9.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	40	420	64	23	360	20	61	10	43	20	10	50
Future Vol, veh/h	40	420	64	23	360	20	61	10	43	20	10	50
Conflicting Peds, #/hr	12	0	24	24	0	12	4	0	4	4	0	4
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	60	-	-	80	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	48	506	77	28	434	24	73	12	52	24	12	60
Major/Minor	Major1		Major2			Minor1			Minor2			
Conflicting Flow All	470	0	0	607	0	0	1207	1191	573	1191	1217	462
Stage 1	-	-	-	-	-	-	665	665	-	514	514	-
Stage 2	-	-	-	-	-	-	542	526	-	677	703	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	1086	-	-	966	-	-	159	187	517	163	180	598
Stage 1	-	-	-	-	-	-	448	456	-	541	534	-
Stage 2	-	-	-	-	-	-	523	527	-	441	438	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1074	-	-	944	-	-	124	167	503	129	161	589
Mov Cap-2 Maneuver	-	-	-	-	-	-	124	167	-	129	161	-
Stage 1	-	-	-	-	-	-	418	425	-	511	512	-
Stage 2	-	-	-	-	-	-	443	505	-	366	409	-
Approach	EB		WB			NB			SB			
HCM Control Delay, s	0.6		0.5			71.2			26.2			
HCM LOS						F			D			
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	179	1074	-	-	944	-	-	265				
HCM Lane V/C Ratio	0.767	0.045	-	-	0.029	-	-	0.364				
HCM Control Delay (s)	71.2	8.5	-	-	8.9	-	-	26.2				
HCM Lane LOS	F	A	-	-	A	-	-	D				
HCM 95th %tile Q(veh)	5	0.1	-	-	0.1	-	-	1.6				

HCM 6th Signalized Intersection Summary 3: Range Ave & W Steele Ln

Lance Drive Residential TIA
Cumulative Plus Project AM (120-140 Seconds)











												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	491	61	60	320	50	50	210	30	40	180	40
Future Volume (veh/h)	50	491	61	60	320	50	50	210	30	40	180	40
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.95	1.00		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	57	558	67	68	364	55	57	239	20	45	205	29
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	718	1244	149	562	1203	182	73	394	33	58	363	50
Arrive On Green	0.77	0.77	0.77	0.77	0.77	0.77	0.04	0.12	0.12	0.03	0.12	0.12
Sat Flow, veh/h	959	1624	195	793	1571	237	1767	3281	272	1767	3082	428
Grp Volume(v), veh/h	57	0	625	68	0	419	57	127	132	45	116	118
Grp Sat Flow(s),veh/h/ln	959	0	1820	793	0	1808	1767	1763	1790	1767	1763	1747
Q Serve(g_s), s	2.7	0.0	17.2	4.7	0.0	9.9	4.5	9.6	9.8	3.5	8.7	9.0
Cycle Q Clear(g_c), s	12.6	0.0	17.2	21.8	0.0	9.9	4.5	9.6	9.8	3.5	8.7	9.0
Prop In Lane	1.00		0.11	1.00		0.13	1.00		0.15	1.00		0.24
Lane Grp Cap(c), veh/h	718	0	1393	562	0	1385	73	212	215	58	208	206
V/C Ratio(X)	0.08	0.00	0.45	0.12	0.00	0.30	0.78	0.60	0.61	0.78	0.56	0.58
Avail Cap(c_a), veh/h	718	0	1393	562	0	1385	189	404	410	126	341	338
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.79	0.79	0.79	1.00	1.00	1.00
Uniform Delay (d), s/veh	6.9	0.0	5.8	9.7	0.0	5.0	66.5	58.4	58.5	67.2	58.3	58.4
Incr Delay (d2), s/veh	0.2	0.0	1.0	0.4	0.0	0.6	5.3	0.8	0.8	8.1	0.9	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	6.1	0.9	0.0	3.5	2.1	4.3	4.4	1.7	3.9	4.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	7.1	0.0	6.9	10.2	0.0	5.6	71.8	59.2	59.3	75.3	59.2	59.4
LnGrp LOS	A	A	A	B	A	A	E	E	E	E	E	E
Approach Vol, veh/h	682			487			316			279		
Approach Delay, s/veh	6.9			6.2			61.5			61.9		
Approach LOS	A			A			E			E		
Timer - Assigned Phs	2		3	4		6	7	8				
Phs Duration (G+Y+Rc), s	110.8		8.8	20.4		110.8	8.5	20.7				
Change Period (Y+Rc), s	3.6		3.0	3.9		3.6	3.9	* 3.9				
Max Green Setting (Gmax), s	87.4		15.0	27.1		87.4	10.0	* 32				
Max Q Clear Time (g_c+I1), s	19.2		6.5	11.0		23.8	5.5	11.8				
Green Ext Time (p_c), s	1.5		0.0	0.4		1.1	0.0	0.4				
Intersection Summary												
HCM 6th Ctrl Delay	25.2											
HCM 6th LOS	C											
Notes												

HCM 6th Signalized Intersection Summary

4: Marlow Rd & Guerneville Rd

Lance Drive Residential TIA
Cumulative Plus Project AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	140	538	170	198	342	111	150	560	210	141	590	100
Future Volume (veh/h)	140	538	170	198	342	111	150	560	210	141	590	100
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	152	585	119	215	372	95	163	609	105	153	641	96
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	179	693	475	241	655	165	190	730	534	244	729	109
Arrive On Green	0.10	0.20	0.20	0.14	0.24	0.24	0.11	0.21	0.21	0.14	0.24	0.24
Sat Flow, veh/h	1767	3526	1558	1767	2783	702	1767	3526	1541	1767	3066	458
Grp Volume(v), veh/h	152	585	119	215	234	233	163	609	105	153	368	369
Grp Sat Flow(s),veh/h/ln	1767	1763	1558	1767	1763	1723	1767	1763	1541	1767	1763	1762
Q Serve(g_s), s	11.0	20.8	3.0	15.5	15.2	15.6	11.8	21.5	0.0	10.6	26.2	26.2
Cycle Q Clear(g_c), s	11.0	20.8	3.0	15.5	15.2	15.6	11.8	21.5	0.0	10.6	26.2	26.2
Prop In Lane	1.00		1.00	1.00		0.41	1.00		1.00	1.00		0.26
Lane Grp Cap(c), veh/h	179	693	475	241	415	405	190	730	534	244	419	419
V/C Ratio(X)	0.85	0.84	0.25	0.89	0.56	0.58	0.86	0.83	0.20	0.63	0.88	0.88
Avail Cap(c_a), veh/h	265	849	544	295	454	444	268	974	640	265	484	484
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.98	0.98	0.98	0.47	0.47	0.47	0.89	0.89	0.89
Uniform Delay (d), s/veh	57.5	50.3	7.7	55.2	43.8	44.0	57.1	49.4	30.0	52.9	47.7	47.8
Incr Delay (d2), s/veh	15.5	6.6	0.3	23.2	5.4	5.7	9.2	2.3	0.1	3.7	13.8	14.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.6	9.6	1.9	8.4	7.2	7.2	5.7	9.5	2.3	4.9	13.0	13.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	73.0	56.9	8.0	78.4	49.2	49.7	66.3	51.8	30.1	56.5	61.5	61.9
LnGrp LOS	E	E	A	E	D	D	E	D	C	E	E	E
Approach Vol, veh/h	856		682			877			890			
Approach Delay, s/veh	53.0		58.6			51.9			60.8			
Approach LOS	D		E			D			E			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	31.5	31.2	19.2	36.2	18.4	36.3	23.2	32.2				
Change Period (Y+Rc), s	5.7	* 5.7	5.3	5.3	5.3	5.7	5.3	5.3				
Max Green Setting (Gmax), s	31.5	* 31	19.7	35.7	19.5	33.5	19.5	35.9				
Max Q Clear Time (g_c+I1), s	22.8	22.8	13.8	28.2	13.0	17.6	12.6	23.5				
Green Ext Time (p_c), s	0.2	2.7	0.2	2.6	0.2	2.3	0.2	3.4				

Intersection Summary

HCM 6th Ctrl Delay 55.9

HCM 6th LOS E

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary 5: Ridley Ave & Guerneville Rd

Lance Drive Residential TIA
Cumulative Plus Project AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	829	30	76	571	20	50	10	72	40	10	30
Future Volume (veh/h)	30	829	30	76	571	20	50	10	72	40	10	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	0.98		0.97	0.99		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	34	931	33	85	642	21	56	11	33	45	11	9
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	699	2937	104	508	2949	96	121	29	54	140	33	21
Arrive On Green	0.85	0.85	0.85	1.00	1.00	1.00	0.10	0.10	0.10	0.10	0.10	0.10
Sat Flow, veh/h	765	3470	123	578	3483	114	776	277	518	923	320	200
Grp Volume(v), veh/h	34	473	491	85	325	338	100	0	0	65	0	0
Grp Sat Flow(s),veh/h/ln	765	1763	1830	578	1763	1834	1571	0	0	1443	0	0
Q Serve(g_s), s	1.0	7.9	7.9	1.7	0.0	0.0	2.2	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	1.0	7.9	7.9	9.5	0.0	0.0	8.0	0.0	0.0	5.8	0.0	0.0
Prop In Lane	1.00		0.07	1.00		0.06	0.56		0.33	0.69		0.14
Lane Grp Cap(c), veh/h	699	1492	1549	508	1492	1553	204	0	0	194	0	0
V/C Ratio(X)	0.05	0.32	0.32	0.17	0.22	0.22	0.49	0.00	0.00	0.34	0.00	0.00
Avail Cap(c_a), veh/h	699	1492	1549	508	1492	1553	499	0	0	484	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.86	0.86	0.86	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	1.7	2.3	2.3	0.3	0.0	0.0	59.6	0.0	0.0	58.7	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.5	0.5	0.1	0.0	0.0	0.7	0.0	0.0	0.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln0.1	1.9	2.0	0.0	0.0	0.0	0.0	3.5	0.0	0.0	2.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	1.8	2.7	2.7	0.4	0.0	0.0	60.3	0.0	0.0	59.1	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	E	A	A	E	A	A
Approach Vol, veh/h	998			748			100			65		
Approach Delay, s/veh	2.7			0.1			60.3			59.1		
Approach LOS	A			A			E			E		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	122.4			17.6			122.4			17.6		
Change Period (Y+Rc), s	3.9			3.0			3.9			3.0		
Max Green Setting (Gmax), s	90.1			43.0			90.1			43.0		
Max Q Clear Time (g_c+I1), s	9.9			7.8			11.5			10.0		
Green Ext Time (p_c), s	2.0			0.2			1.7			0.3		

Intersection Summary

HCM 6th Ctrl Delay	6.6
HCM 6th LOS	A

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

6: Lance Dr & Guerneville Rd

Lance Drive Residential TIA
Cumulative Plus Project AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	48	866	30	30	526	99	20	64	80	178	112	119
Future Volume (veh/h)	48	866	30	30	526	99	20	64	80	178	112	119
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	57	1031	35	36	626	98	24	76	59	212	133	127
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	72	1060	36	67	1064	464	89	275	198	246	131	125
Arrive On Green	0.08	0.61	0.61	0.01	0.10	0.10	0.33	0.33	0.33	0.33	0.33	0.33
Sat Flow, veh/h	1767	3476	118	1767	3526	1537	180	830	596	628	394	376
Grp Volume(v), veh/h	57	523	543	36	626	98	159	0	0	472	0	0
Grp Sat Flow(s), veh/h/ln	1767	1763	1831	1767	1763	1537	1607	0	0	1399	0	0
Q Serve(g_s), s	4.4	39.8	39.8	2.8	23.8	8.2	0.0	0.0	0.0	37.0	0.0	0.0
Cycle Q Clear(g_c), s	4.4	39.8	39.8	2.8	23.8	8.2	9.4	0.0	0.0	46.4	0.0	0.0
Prop In Lane	1.00		0.06	1.00		1.00	0.15		0.37	0.45		0.27
Lane Grp Cap(c), veh/h	72	538	558	67	1064	464	562	0	0	501	0	0
V/C Ratio(X)	0.79	0.97	0.97	0.54	0.59	0.21	0.28	0.00	0.00	0.94	0.00	0.00
Avail Cap(c_a), veh/h	135	852	885	135	1705	743	562	0	0	501	0	0
HCM Platoon Ratio	2.00	2.00	2.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.96	0.96	0.96	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	63.7	26.7	26.7	67.9	54.7	47.7	34.4	0.0	0.0	48.0	0.0	0.0
Incr Delay (d2), s/veh	6.9	15.3	14.9	2.4	2.3	1.0	0.1	0.0	0.0	26.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	13.2	13.7	1.3	11.6	3.4	4.1	0.0	0.0	20.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	70.5	42.0	41.7	70.3	57.0	48.7	34.5	0.0	0.0	74.1	0.0	0.0
LnGrp LOS	E	D	D	E	E	D	C	A	A	E	A	A
Approach Vol, veh/h	1123			760			159			472		
Approach Delay, s/veh	43.3			56.6			34.5			74.1		
Approach LOS	D			E			C			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	48.0			51.0	11.0	47.5		51.0				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		4.6				
Max Green Setting (Gmax), s	67.7			46.4	10.7	67.7		46.4				
Max Q Clear Time (g_c+14), s	41.8			48.4	6.4	25.8		11.4				
Green Ext Time (p_c), s	0.0	0.9		0.0	0.0	0.7		0.2				

Intersection Summary

HCM 6th Ctrl Delay 52.5

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

7: N Dutton Ave/Westberry Dr & Guerneville Rd

Lance Drive Residential TIA
Cumulative Plus Project AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	1069	155	290	572	10	113	10	440	30	10	10
Future Volume (veh/h)	10	1069	155	290	572	10	113	10	440	30	10	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.99	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	12	1288	181	349	689	11	145	0	219	36	12	1
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	28	1226	171	1226	2617	42	194	0	648	60	20	2
Arrive On Green	0.02	0.40	0.40	0.72	1.00	1.00	0.05	0.00	0.05	0.05	0.05	0.05
Sat Flow, veh/h	1767	3099	432	3428	3550	57	3534	0	1564	1309	436	36
Grp Volume(v), veh/h	12	729	740	349	342	358	145	0	219	49	0	0
Grp Sat Flow(s), veh/h/ln	1767	1763	1768	1714	1763	1844	1767	0	1564	1782	0	0
Q Serve(g_s), s	0.9	55.4	55.4	5.1	0.0	0.0	5.7	0.0	0.0	3.8	0.0	0.0
Cycle Q Clear(g_c), s	0.9	55.4	55.4	5.1	0.0	0.0	5.7	0.0	0.0	3.8	0.0	0.0
Prop In Lane	1.00		0.24	1.00		0.03	1.00		1.00	0.73		0.02
Lane Grp Cap(c), veh/h	28	698	700	1226	1300	1359	194	0	648	81	0	0
V/C Ratio(X)	0.42	1.04	1.06	0.28	0.26	0.26	0.75	0.00	0.34	0.60	0.00	0.00
Avail Cap(c_a), veh/h	77	698	700	1226	1300	1359	220	0	659	353	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.79	0.79	0.79	0.91	0.91	0.91	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	68.2	42.3	42.3	13.5	0.0	0.0	65.2	0.0	28.1	65.6	0.0	0.0
Incr Delay (d2), s/veh	2.9	42.6	46.7	0.0	0.4	0.4	9.6	0.0	0.1	2.7	0.0	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	0.4	31.5	32.4	1.8	0.2	0.2	2.8	0.0	5.0	1.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	71.2	84.9	89.0	13.6	0.4	0.4	74.8	0.0	28.2	68.2	0.0	0.0
LnGrp LOS	E	F	F	B	A	A	E	A	C	E	A	A
Approach Vol, veh/h	1481			1049			364			49		
Approach Delay, s/veh	86.9			4.8			46.8			68.2		
Approach LOS	F			A			D			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	55.4	60.7		11.0	7.5	108.5		13.0				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		5.3				
Max Green Setting (Gmax), s	55.4	55.4		27.7	6.1	77.0		8.7				
Max Q Clear Time (g_c+I1), s	57.4	57.4		5.8	2.9	2.0		7.7				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	0.5		0.0				

Intersection Summary

HCM 6th Ctrl Delay 52.3

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

8: Herbert St/Coffey Ln & Guerneville Rd

Lance Drive Residential TIA
Cumulative Plus Project AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	150	1339	40	30	652	50	30	20	20	90	10	180
Future Volume (veh/h)	150	1339	40	30	652	50	30	20	20	90	10	180
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.96	1.00		0.94	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	174	1557	46	35	758	55	35	23	6	105	12	62
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	194	1556	46	444	1949	141	63	41	11	150	17	316
Arrive On Green	0.22	0.89	0.89	0.25	0.59	0.59	0.07	0.07	0.07	0.09	0.09	0.09
Sat Flow, veh/h	1767	3491	103	1767	3321	241	965	634	165	1594	182	1511
Grp Volume(v), veh/h	174	784	819	35	402	411	64	0	0	117	0	62
Grp Sat Flow(s), veh/h/ln	1767	1763	1831	1767	1763	1799	1765	0	0	1776	0	1511
Q Serve(g_s), s	13.4	61.2	62.4	2.1	17.1	17.1	4.9	0.0	0.0	8.9	0.0	4.8
Cycle Q Clear(g_c), s	13.4	61.2	62.4	2.1	17.1	17.1	4.9	0.0	0.0	8.9	0.0	4.8
Prop In Lane	1.00		0.06	1.00		0.13	0.55		0.09	0.90		1.00
Lane Grp Cap(c), veh/h	194	786	816	444	1035	1056	115	0	0	168	0	316
V/C Ratio(X)	0.90	1.00	1.00	0.08	0.39	0.39	0.56	0.00	0.00	0.70	0.00	0.20
Avail Cap(c_a), veh/h	263	786	816	444	1035	1056	316	0	0	334	0	457
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.53	0.53	0.53	0.91	0.91	0.91	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	53.8	7.5	7.6	40.1	15.5	15.5	63.5	0.0	0.0	61.5	0.0	46.2
Incr Delay (d2), s/veh	12.6	22.9	23.7	0.0	1.0	1.0	1.6	0.0	0.0	2.0	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.9	8.0	8.6	0.9	6.9	7.1	2.3	0.0	0.0	4.1	0.0	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	66.4	30.4	31.3	40.1	16.5	16.5	65.0	0.0	0.0	63.4	0.0	46.3
LnGrp LOS	E	C	F	D	B	B	E	A	A	E	A	D
Approach Vol, veh/h	1777			848			64			179		
Approach Delay, s/veh	34.4			17.4			65.0			57.5		
Approach LOS	C			B			E			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	40.5	67.7		18.1	20.7	87.5		13.7				
Change Period (Y+Rc), s	5.3	5.3		4.9	5.3	5.3		4.6				
Max Green Setting (Gmax), s	62.4			26.3	20.8	47.7		25.1				
Max Q Clear Time (g_c+14), s	64.4			10.9	15.4	19.1		6.9				
Green Ext Time (p_c), s	0.0	0.0		0.1	0.0	0.7		0.1				
Intersection Summary												
HCM 6th Ctrl Delay				31.5								
HCM 6th LOS				C								

HCM 6th Signalized Intersection Summary

9: Range Ave & Guerneville Rd

Lance Drive Residential TIA
Cumulative Plus Project AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	170	897	182	90	501	10	161	110	90	41	120	130
Future Volume (veh/h)	170	897	182	90	501	10	161	110	90	41	120	130
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	181	954	0	96	533	0	102	213	19	44	128	29
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	310	1020		119	640		180	341	30	111	179	39
Arrive On Green	0.18	0.29	0.00	0.07	0.18	0.00	0.10	0.10	0.10	0.06	0.06	0.06
Sat Flow, veh/h	1767	3618	0	1767	3618	0	1767	3350	295	1767	2847	622
Grp Volume(v), veh/h	181	954	0	96	533	0	102	117	115	44	77	80
Grp Sat Flow(s),veh/h/ln	1767	1763	0	1767	1763	0	1767	1856	1790	1767	1763	1706
Q Serve(g_s), s	11.3	31.6	0.0	6.4	17.5	0.0	6.6	7.2	7.4	2.9	5.2	5.5
Cycle Q Clear(g_c), s	11.3	31.6	0.0	6.4	17.5	0.0	6.6	7.2	7.4	2.9	5.2	5.5
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.17	1.00		0.36
Lane Grp Cap(c), veh/h	310	1020		119	640		180	189	182	111	111	107
V/C Ratio(X)	0.58	0.94		0.81	0.83		0.57	0.62	0.63	0.40	0.70	0.74
Avail Cap(c_a), veh/h	310	1307		158	1072		492	516	498	161	160	155
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.64	0.64	0.00	0.96	0.96	0.00	1.00	1.00	1.00	0.76	0.76	0.76
Uniform Delay (d), s/veh	45.5	41.5	0.0	55.2	47.4	0.0	51.4	51.7	51.7	54.1	55.1	55.3
Incr Delay (d2), s/veh	1.2	6.7	0.0	14.5	11.6	0.0	1.0	1.2	1.3	0.6	2.3	3.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.0	14.2	0.0	3.3	8.6	0.0	3.0	3.4	3.4	1.3	2.3	2.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.7	48.2	0.0	69.7	59.0	0.0	52.4	52.9	53.1	54.7	57.4	59.0
LnGrp LOS	D	D		E	E		D	D	D	D	E	E
Approach Vol, veh/h	1135		A	629		A	334		201			
Approach Delay, s/veh	48.0			60.6			52.8		57.4			
Approach LOS	D			E			D		E			
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	3.4	40.0		12.8	26.3	27.1		16.8				
Change Period (Y+Rc), s	5.3	5.3		5.3	5.3	5.3		4.6				
Max Green Setting (Gmax), s	44.5	44.5		10.9	18.7	36.5		33.4				
Max Q Clear Time (g_c+1/3), s	33.6	33.6		7.5	13.3	19.5		9.4				
Green Ext Time (p_c), s	0.0	1.1		0.0	0.0	0.7		0.2				

Intersection Summary

HCM 6th Ctrl Delay	53.0
HCM 6th LOS	D

Notes

- User approved pedestrian interval to be less than phase max green.
- User approved volume balancing among the lanes for turning movement.
- Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

10: Guerneville Rd & Steele Wy

Lance Drive Residential TIA
Cumulative Plus Project AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	946	52	70	550	10	31	20	70	461	20	20
Future Volume (veh/h)	30	946	52	70	550	10	31	20	70	461	20	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.97	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	34	1075	39	80	625	10	29	31	18	540	0	15
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	797	2089	1015	171	679	11	94	99	161	588	0	970
Arrive On Green	0.45	0.59	0.59	0.05	0.19	0.19	0.05	0.05	0.05	0.17	0.00	0.17
Sat Flow, veh/h	1767	3526	1571	3428	3549	57	1767	1856	1555	3534	0	1567
Grp Volume(v), veh/h	34	1075	39	80	310	325	29	31	18	540	0	15
Grp Sat Flow(s),veh/h/ln	1767	1763	1571	1714	1763	1843	1767	1856	1555	1767	0	1567
Q Serve(g_s), s	1.5	25.0	1.3	3.2	24.2	24.2	2.2	2.3	1.5	21.0	0.0	0.0
Cycle Q Clear(g_c), s	1.5	25.0	1.3	3.2	24.2	24.2	2.2	2.3	1.5	21.0	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.03	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	797	2089	1015	171	337	353	94	99	161	588	0	970
V/C Ratio(X)	0.04	0.51	0.04	0.47	0.92	0.92	0.31	0.31	0.11	0.92	0.00	0.02
Avail Cap(c_a), veh/h	797	2089	1015	198	631	660	346	363	383	886	0	1102
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.80	0.80	0.80	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	21.5	16.7	9.0	64.7	55.6	55.6	63.8	63.8	57.0	57.4	0.0	10.3
Incr Delay (d2), s/veh	0.0	0.7	0.1	0.7	4.4	4.2	0.7	0.7	0.1	8.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	10.1	0.5	1.4	11.1	11.6	1.0	1.1	0.6	10.1	0.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.5	17.4	9.1	65.4	59.9	59.8	64.5	64.5	57.1	65.4	0.0	10.3
LnGrp LOS	C	B	A	E	E	E	E	E	E	E	A	B
Approach Vol, veh/h	1148			715			78			555		
Approach Delay, s/veh	17.3			60.5			62.8			63.9		
Approach LOS	B			E			E			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	1.9	87.9		28.2	68.1	31.7		12.1				
Change Period (Y+Rc), s	4.9	4.9		4.9	4.9	4.9		4.6				
Max Green Setting (Gmax), s	50.1			35.1	8.1	50.1		27.4				
Max Q Clear Time (g_c+1/5), s	27.0			23.0	3.5	26.2		4.3				
Green Ext Time (p_c), s	0.0	1.5		0.1	0.0	0.6		0.0				

Intersection Summary

HCM 6th Ctrl Delay 41.4

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

11: Cleveland Ave & Guerneville Rd

Lance Drive Residential TIA
Cumulative Plus Project AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↑↑↓		↰↱	↑↑	↱	↰	↑↑		↰	↱↱	
Traffic Volume (veh/h)	70	1407	40	210	990	230	40	110	170	270	80	50
Future Volume (veh/h)	70	1407	40	210	990	230	40	110	170	270	80	50
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	77	1546	41	231	1088	153	44	121	80	297	88	39
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	270	1641	44	277	1148	501	614	725	444	381	131	58
Arrive On Green	0.08	0.32	0.32	0.08	0.33	0.33	0.35	0.35	0.35	0.11	0.11	0.11
Sat Flow, veh/h	3428	5071	134	3428	3526	1538	1767	2085	1277	3534	1211	537
Grp Volume(v), veh/h	77	1030	557	231	1088	153	44	101	100	297	0	127
Grp Sat Flow(s), veh/h/ln	1714	1689	1828	1714	1763	1538	1767	1763	1599	1767	0	1748
Q Serve(g_s), s	3.0	41.5	41.5	9.3	42.1	10.4	2.3	5.5	6.1	11.5	0.0	9.8
Cycle Q Clear(g_c), s	3.0	41.5	41.5	9.3	42.1	10.4	2.3	5.5	6.1	11.5	0.0	9.8
Prop In Lane	1.00		0.07	1.00		1.00	1.00		0.80	1.00		0.31
Lane Grp Cap(c), veh/h	270	1093	592	277	1148	501	614	613	556	381	0	189
V/C Ratio(X)	0.29	0.94	0.94	0.83	0.95	0.31	0.07	0.16	0.18	0.78	0.00	0.67
Avail Cap(c_a), veh/h	270	1257	680	394	1488	649	614	613	556	1088	0	538
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.68	0.68	0.68	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	60.8	46.1	46.1	63.4	46.0	35.3	30.5	31.6	31.8	60.8	0.0	60.1
Incr Delay (d2), s/veh	0.2	12.2	19.1	4.9	7.4	0.1	0.2	0.6	0.7	1.3	0.0	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	19.0	21.7	4.2	19.4	3.9	1.1	2.5	2.5	5.2	0.0	4.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.0	58.2	65.2	68.4	53.5	35.4	30.8	32.2	32.5	62.1	0.0	61.6
LnGrp LOS	E	E	E	E	D	D	C	C	C	E	A	E
Approach Vol, veh/h	1664			1472			245			424		
Approach Delay, s/veh	60.7			53.9			32.0			62.0		
Approach LOS	E			D			C			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.2	50.2		53.6	15.9	50.5		20.0				
Change Period (Y+Rc), s	4.9	4.9		4.9	4.9	4.9		4.9				
Max Green Setting (Gmax), s	6.5	52.1		9.1	9.1	59.1		43.1				
Max Q Clear Time (g_c+I1), s	11.3	43.5		8.1	5.0	44.1		13.5				
Green Ext Time (p_c), s	0.0	1.8		0.0	0.0	1.5		0.1				

Intersection Summary

HCM 6th Ctrl Delay 56.4

HCM 6th LOS E

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 12: US 101 SB Ramps & Guerneville Rd

Lance Drive Residential TIA
Cumulative Plus Project AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑					↑	↑	↑
Traffic Volume (veh/h)	0	1244	603	310	1082	0	0	0	0	420	10	338
Future Volume (veh/h)	0	1244	603	310	1082	0	0	0	0	420	10	338
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1856	1856	1856	1856	0				1856	1856	1856
Adj Flow Rate, veh/h	0	1398	268	348	1216	0				480	0	323
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89				0.89	0.89	0.89
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	1505	459	393	1575	0				1716	0	763
Arrive On Green	0.00	0.30	0.30	0.11	0.45	0.00				0.49	0.00	0.49
Sat Flow, veh/h	0	5233	1545	3428	3618	0				3534	0	1572
Grp Volume(v), veh/h	0	1398	268	348	1216	0				480	0	323
Grp Sat Flow(s),veh/h/ln	0	1689	1545	1714	1763	0				1767	0	1572
Q Serve(g_s), s	0.0	37.5	20.7	14.0	40.8	0.0				11.3	0.0	18.6
Cycle Q Clear(g_c), s	0.0	37.5	20.7	14.0	40.8	0.0				11.3	0.0	18.6
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1505	459	393	1575	0				1716	0	763
V/C Ratio(X)	0.00	0.93	0.58	0.89	0.77	0.00				0.28	0.00	0.42
Avail Cap(c_a), veh/h	0	2066	630	566	2143	0				1716	0	763
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.28	0.28	0.72	0.72	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	47.8	41.8	61.1	32.7	0.0				21.4	0.0	23.3
Incr Delay (d2), s/veh	0.0	1.7	0.1	6.6	0.6	0.0				0.4	0.0	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	15.8	7.9	6.4	17.2	0.0				4.7	0.0	7.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	49.5	42.0	67.7	33.3	0.0				21.9	0.0	25.0
LnGrp LOS	A	D	D	E	C	A				C	A	C
Approach Vol, veh/h		1666			1564						803	
Approach Delay, s/veh		48.3			40.9						23.1	
Approach LOS		D			D						C	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	30.9	46.5		72.6		67.4						
Change Period (Y+Rc), s	4.9	4.9		4.6		4.9						
Max Green Setting (Gmax), s	28.5	57.1		45.4		85.1						
Max Q Clear Time (g_c+I10), s	11.0	39.5		20.6		42.8						
Green Ext Time (p_c), s	0.0	2.1		0.1		1.8						

Intersection Summary

HCM 6th Ctrl Delay 40.4
HCM 6th LOS D

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 13: US 101 NB Ramps & Guerneville Rd/Steele Ln

Lance Drive Residential TIA
Cumulative Plus Project AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↑↑			↑↑↑		↰	↰↱	↰			
Traffic Volume (veh/h)	473	1191	0	0	953	250	439	10	500	0	0	0
Future Volume (veh/h)	473	1191	0	0	953	250	439	10	500	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1856	1856	0	0	1856	1856	1856	1856	1856			
Adj Flow Rate, veh/h	531	1338	0	0	1071	252	632	0	291			
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89			
Percent Heavy Veh, %	3	3	0	0	3	3	3	3	3			
Cap, veh/h	1431	2591	0	0	1151	271	697	0	310			
Arrive On Green	0.83	1.00	0.00	0.00	0.28	0.28	0.20	0.00	0.20			
Sat Flow, veh/h	3428	3618	0	0	4242	958	3534	0	1572			
Grp Volume(v), veh/h	531	1338	0	0	887	436	632	0	291			
Grp Sat Flow(s),veh/h/ln	1714	1763	0	0	1689	1656	1767	0	1572			
Q Serve(g_s), s	5.2	0.0	0.0	0.0	35.8	35.9	24.5	0.0	25.5			
Cycle Q Clear(g_c), s	5.2	0.0	0.0	0.0	35.8	35.9	24.5	0.0	25.5			
Prop In Lane	1.00		0.00	0.00		0.58	1.00		1.00			
Lane Grp Cap(c), veh/h	1431	2591	0	0	954	468	697	0	310			
V/C Ratio(X)	0.37	0.52	0.00	0.00	0.93	0.93	0.91	0.00	0.94			
Avail Cap(c_a), veh/h	1431	2591	0	0	1209	592	1171	0	521			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.53	0.53	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	7.2	0.0	0.0	0.0	48.9	48.9	54.9	0.0	55.3			
Incr Delay (d2), s/veh	0.0	0.4	0.0	0.0	9.8	17.2	3.5	0.0	11.6			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	1.5	0.1	0.0	0.0	16.2	16.9	11.0	0.0	10.9			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	7.2	0.4	0.0	0.0	58.7	66.1	58.4	0.0	67.0			
LnGrp LOS	A	A	A	A	E	E	E	A	E			
Approach Vol, veh/h	1869			1323			923					
Approach Delay, s/veh	2.3			61.2			61.1					
Approach LOS	A			E			E					
Timer - Assigned Phs	2			5			6			8		
Phs Duration (G+Y+Rc), s	107.8			63.3			44.4			32.2		
Change Period (Y+Rc), s	4.9			4.9			4.9			4.6		
Max Green Setting (Gmax), s	84.1			29.1			50.1			46.4		
Max Q Clear Time (g_c+I1), s	2.0			7.2			37.9			27.5		
Green Ext Time (p_c), s	2.1			0.1			1.7			0.1		

Intersection Summary

HCM 6th Ctrl Delay	34.4
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 14: Stony Point Rd/Marlow Rd & W College Ave

Lance Drive Residential TIA
Cumulative Plus Project AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	94	410	170	185	220	150	90	696	192	200	677	81
Future Volume (veh/h)	94	410	170	185	220	150	90	696	192	200	677	81
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	104	456	151	206	244	73	100	773	130	222	752	81
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	377	526	173	464	677	198	122	858	788	247	1006	108
Arrive On Green	0.21	0.20	0.20	0.26	0.25	0.25	0.07	0.24	0.24	0.14	0.31	0.31
Sat Flow, veh/h	1767	2594	851	1767	2687	785	1767	3526	1539	1767	3203	345
Grp Volume(v), veh/h	104	309	298	206	158	159	100	773	130	222	414	419
Grp Sat Flow(s), veh/h/ln	1767	1763	1683	1767	1763	1710	1767	1763	1539	1767	1763	1785
Q Serve(g_s), s	6.9	23.7	24.1	13.6	10.3	10.7	7.8	29.7	3.1	17.3	29.5	29.5
Cycle Q Clear(g_c), s	6.9	23.7	24.1	13.6	10.3	10.7	7.8	29.7	3.1	17.3	29.5	29.5
Prop In Lane	1.00		0.51	1.00		0.46	1.00		1.00	1.00		0.19
Lane Grp Cap(c), veh/h	377	357	341	464	444	431	122	858	788	247	553	561
V/C Ratio(X)	0.28	0.86	0.88	0.44	0.36	0.37	0.82	0.90	0.17	0.90	0.75	0.75
Avail Cap(c_a), veh/h	377	437	417	464	477	463	196	924	816	312	578	585
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.43	0.43	0.43	1.00	1.00	1.00	0.58	0.58	0.58
Uniform Delay (d), s/veh	46.0	53.9	54.1	43.1	43.0	43.2	64.3	51.3	6.8	59.2	43.0	43.1
Incr Delay (d2), s/veh	0.4	14.0	16.0	0.3	0.2	0.2	13.2	11.3	0.1	15.3	3.0	3.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	11.7	11.6	5.9	4.5	4.5	3.9	14.3	1.3	8.7	13.1	13.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.4	67.9	70.1	43.4	43.2	43.4	77.4	62.6	6.9	74.6	46.1	46.0
LnGrp LOS	D	E	E	D	D	D	E	E	A	E	D	D
Approach Vol, veh/h	711				523				1003			
Approach Delay, s/veh	65.7				43.3				56.9			
Approach LOS	E				D				E			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	42.1	33.7	15.0	49.3	35.2	40.6	24.9	39.4				
Change Period (Y+Rc), s	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3				
Max Green Setting (Gmax), s	27.3	34.7	15.5	45.9	19.5	37.9	24.7	36.7				
Max Q Clear Time (g_c+I1), s	11.6	26.1	9.8	31.5	8.9	12.7	19.3	31.7				
Green Ext Time (p_c), s	0.3	2.3	0.1	4.3	0.2	1.7	0.3	2.3				

Intersection Summary

HCM 6th Ctrl Delay 55.1

HCM 6th LOS E

Notes









User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

15: N Dutton Ave & W College Ave

Lance Drive Residential TIA
Cumulative Plus Project AM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	110	810	110	100	610	337	90	428	120	249	272	60
Future Volume (veh/h)	110	810	110	100	610	337	90	428	120	249	272	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No				No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	118	871	107	108	656	297	97	460	106	268	292	41
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	140	932	114	136	705	319	511	516	118	602	724	100
Arrive On Green	0.08	0.30	0.30	0.08	0.30	0.30	0.29	0.18	0.18	0.34	0.23	0.23
Sat Flow, veh/h	1767	3152	387	1767	2354	1066	1767	2836	649	1767	3101	430
Grp Volume(v), veh/h	118	487	491	108	491	462	97	285	281	268	165	168
Grp Sat Flow(s),veh/h/ln	1767	1763	1777	1767	1763	1657	1767	1763	1722	1767	1763	1768
Q Serve(g_s), s	9.2	37.7	37.7	8.4	37.9	37.9	5.8	22.0	22.4	16.5	11.0	11.3
Cycle Q Clear(g_c), s	9.2	37.7	37.7	8.4	37.9	37.9	5.8	22.0	22.4	16.5	11.0	11.3
Prop In Lane	1.00		0.22	1.00		0.64	1.00		0.38	1.00		0.24
Lane Grp Cap(c), veh/h	140	521	525	136	528	496	511	321	313	602	411	413
V/C Ratio(X)	0.84	0.93	0.93	0.80	0.93	0.93	0.19	0.89	0.90	0.45	0.40	0.41
Avail Cap(c_a), veh/h	189	618	623	252	681	640	511	530	518	602	568	570
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.61	0.61	0.61	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	63.6	48.0	48.0	63.6	47.6	47.6	37.4	55.9	56.0	35.9	45.4	45.5
Incr Delay (d2), s/veh	11.0	12.8	12.7	4.0	15.1	15.8	0.1	5.8	7.0	0.2	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.6	18.2	18.3	3.9	18.7	17.7	2.5	10.3	10.3	7.1	4.8	5.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	74.5	60.8	60.7	67.6	62.7	63.5	37.5	61.7	63.0	36.0	45.6	45.7
LnGrp LOS	E	E	E	E	E	E	D	E	E	D	D	D
Approach Vol, veh/h	1096		1061			663			601			
Approach Delay, s/veh	62.2		63.5			58.7			41.4			
Approach LOS	E		E			E			D			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	4.6	45.3	43.5	36.6	14.1	45.8	50.7	29.4				
Change Period (Y+Rc), s	3.9	* 3.9	3.0	3.9	3.0	3.9	3.0	3.9				
Max Green Setting (Gmax), s	49.0	* 49	12.0	45.1	15.0	54.1	15.0	42.1				
Max Q Clear Time (g_c+I10), s	39.7	39.7	7.8	13.3	11.2	39.9	18.5	24.4				
Green Ext Time (p_c), s	0.0	1.7	0.0	0.6	0.0	2.0	0.0	1.1				

Intersection Summary

HCM 6th Ctrl Delay 58.3

HCM 6th LOS E

Notes





User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection

Intersection Delay, s/veh 8.8

Intersection LOS A




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	8	72	0	20	32	69	0	8	55	116	2	3
Future Vol, veh/h	8	72	0	20	32	69	0	8	55	116	2	3
Peak Hour Factor	0.66	0.66	0.92	0.92	0.66	0.66	0.92	0.92	0.92	0.66	0.92	0.66
Heavy Vehicles, %	3	3	2	2	3	3	2	2	2	3	2	3
Mvmt Flow	12	109	0	22	48	105	0	9	60	176	2	5
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.7	8.6	7.8	9.5
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	10%	17%	96%
Vol Thru, %	13%	90%	26%	2%
Vol Right, %	87%	0%	57%	2%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	63	80	121	121
LT Vol	0	8	20	116
Through Vol	8	72	32	2
RT Vol	55	0	69	3
Lane Flow Rate	68	121	175	182
Geometry Grp	1	1	1	1
Degree of Util (X)	0.082	0.161	0.213	0.247
Departure Headway (Hd)	4.322	4.776	4.379	4.882
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	825	749	818	734
Service Time	2.369	2.814	2.414	2.923
HCM Lane V/C Ratio	0.082	0.162	0.214	0.248
HCM Control Delay	7.8	8.7	8.6	9.5
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.3	0.6	0.8	1




HCM 6th TWSC
17: Iroquois St & Project Driveway (1)

Lance Drive Residential TIA
Cumulative Plus Project AM (120-140 Seconds)

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	7	2	82	106	1
Future Vol, veh/h	2	7	2	82	106	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	8	2	89	115	1
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	209	116	116	0	-	0
Stage 1	116	-	-	-	-	-
Stage 2	93	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	779	936	1473	-	-	-
Stage 1	909	-	-	-	-	-
Stage 2	931	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	778	936	1473	-	-	-
Mov Cap-2 Maneuver	778	-	-	-	-	-
Stage 1	908	-	-	-	-	-
Stage 2	931	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	9.1	0.2		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1473	-	896	-	-	
HCM Lane V/C Ratio	0.001	-	0.011	-	-	
HCM Control Delay (s)	7.4	0	9.1	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	




HCM 6th TWSC
18: Iroquois St & Project Driveway (2)

Lance Drive Residential TIA
Cumulative Plus Project AM (120-140 Seconds)

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	8	3	82	113	0
Future Vol, veh/h	2	8	3	82	113	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	9	3	89	123	0
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	218	123	123	0	-	0
Stage 1	123	-	-	-	-	-
Stage 2	95	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	770	928	1464	-	-	-
Stage 1	902	-	-	-	-	-
Stage 2	929	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	768	928	1464	-	-	-
Mov Cap-2 Maneuver	768	-	-	-	-	-
Stage 1	900	-	-	-	-	-
Stage 2	929	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	9.1	0.3		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1464	-	891	-	-	
HCM Lane V/C Ratio	0.002	-	0.012	-	-	
HCM Control Delay (s)	7.5	0	9.1	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	




HCM 6th TWSC
19: Project Driveway (3) & Lance Dr

Lance Drive Residential TIA
Cumulative Plus Project AM (120-140 Seconds)

Intersection						
Int Delay, s/veh	1.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	232	1	14	107	4	37
Future Vol, veh/h	232	1	14	107	4	37
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	252	1	15	116	4	40
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	253	0	399	253
Stage 1	-	-	-	-	253	-
Stage 2	-	-	-	-	146	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1312	-	607	786
Stage 1	-	-	-	-	789	-
Stage 2	-	-	-	-	881	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1312	-	600	786
Mov Cap-2 Maneuver	-	-	-	-	600	-
Stage 1	-	-	-	-	789	-
Stage 2	-	-	-	-	870	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0.9		10	
HCM LOS					B	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	763	-	-	1312	-	
HCM Lane V/C Ratio	0.058	-	-	0.012	-	
HCM Control Delay (s)	10	-	-	7.8	0	
HCM Lane LOS	B	-	-	A	A	
HCM 95th %tile Q(veh)	0.2	-	-	0	-	

HCM 6th TWSC
20: Guerneville Rd & Project Driveway (4)























Lance Drive Residential TIA
Cumulative Plus Project AM (120-140 Seconds)

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	918	649	6	16	8
Future Vol, veh/h	3	918	649	6	16	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	998	705	7	17	9
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	712	0	-	0	1214	356
Stage 1	-	-	-	-	709	-
Stage 2	-	-	-	-	505	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	884	-	-	-	174	640
Stage 1	-	-	-	-	449	-
Stage 2	-	-	-	-	571	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	884	-	-	-	173	640
Mov Cap-2 Maneuver	-	-	-	-	173	-
Stage 1	-	-	-	-	445	-
Stage 2	-	-	-	-	571	-
Approach	EB	WB		SB		
HCM Control Delay, s	0	0		22.7		
HCM LOS				C		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	884	-	-	-	229	
HCM Lane V/C Ratio	0.004	-	-	-	0.114	
HCM Control Delay (s)	9.1	0	-	-	22.7	
HCM Lane LOS	A	A	-	-	C	
HCM 95th %tile Q(veh)	0	-	-	-	0.4	

HCM 6th Signalized Intersection Summary







1: Marlow Rd & Marlow Ct/W Steele Ln

Lance Drive Residential TIA
Cumulative Plus Project PM (95-120 Seconds)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	0	10	200	10	178	10	751	200	142	851	10
Future Volume (veh/h)	10	0	10	200	10	178	10	751	200	142	851	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	11	0	0	219	0	118	11	791	150	149	896	11
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	60	0	0	1728	0	854	23	877	1147	98	1039	13
Arrive On Green	0.03	0.00	0.00	0.49	0.00	0.49	0.01	0.25	0.25	0.06	0.29	0.29
Sat Flow, veh/h	1767	0	0	3534	0	1568	1767	3526	1519	1767	3566	44
Grp Volume(v), veh/h	11	0	0	219	0	118	11	791	150	149	443	464
Grp Sat Flow(s),veh/h/ln	1767	0	0	1767	0	1568	1767	1763	1519	1767	1763	1847
Q Serve(g_s), s	0.7	0.0	0.0	3.7	0.0	0.0	0.7	23.9	3.2	6.1	26.2	26.2
Cycle Q Clear(g_c), s	0.7	0.0	0.0	3.7	0.0	0.0	0.7	23.9	3.2	6.1	26.2	26.2
Prop In Lane	1.00		0.00	1.00		1.00	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	60	0	0	1728	0	854	23	877	1147	98	514	538
V/C Ratio(X)	0.18	0.00	0.00	0.13	0.00	0.14	0.48	0.90	0.13	1.52	0.86	0.86
Avail Cap(c_a), veh/h	408	0	0	1728	0	854	154	917	1164	98	514	538
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.58	0.58	0.58	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.6	0.0	0.0	15.3	0.0	12.3	53.9	40.0	4.2	52.0	36.9	36.9
Incr Delay (d2), s/veh	1.4	0.0	0.0	0.2	0.0	0.3	8.7	7.3	0.0	279.2	14.0	13.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.0	1.5	0.0	1.5	0.4	11.0	3.3	10.3	13.0	13.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	53.1	0.0	0.0	15.5	0.0	12.7	62.7	47.3	4.2	331.2	50.9	50.4
LnGrp LOS	D	A	A	B	A	B	E	D	A	F	D	D
Approach Vol, veh/h		11			337			952			1056	
Approach Delay, s/veh		53.1			14.5			40.7			90.2	
Approach LOS		D			B			D			F	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		58.4	6.3	36.9		8.4	11.0	32.3				
Change Period (Y+Rc), s		4.6	4.9	4.9		4.6	4.9	4.9				
Max Green Setting (Gmax), s		30.9	9.6	25.1		25.4	6.1	28.6				
Max Q Clear Time (g_c+I1), s		5.7	2.7	28.2		2.7	8.1	25.9				
Green Ext Time (p_c), s		1.1	0.0	0.0		0.0	0.0	1.5				
Intersection Summary												
HCM 6th Ctrl Delay				59.2								
HCM 6th LOS				E								
Notes												
User approved pedestrian interval to be less than phase max green.												
User approved volume balancing among the lanes for turning movement.												

HCM 6th TWSC
2: Iroquois St/Apple Valley Ln & W Steele Ln

Lance Drive Residential TIA
Cumulative Plus Project PM (95-120 Seconds)

Intersection												
Int Delay, s/veh	7.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	30	340	64	65	530	50	59	10	39	30	20	30
Future Vol, veh/h	30	340	64	65	530	50	59	10	39	30	20	30
Conflicting Peds, #/hr	9	0	9	9	0	9	1	0	2	2	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	60	-	-	80	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	32	358	67	68	558	53	62	11	41	32	21	32






















Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	620	0	0	434	0	0	1213	1221	403	1214	1228	595
Stage 1	-	-	-	-	-	-	465	465	-	730	730	-
Stage 2	-	-	-	-	-	-	748	756	-	484	498	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	956	-	-	1120	-	-	158	179	645	158	177	502
Stage 1	-	-	-	-	-	-	576	561	-	412	426	-
Stage 2	-	-	-	-	-	-	403	415	-	562	543	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	948	-	-	1110	-	-	122	159	638	129	158	497
Mov Cap-2 Maneuver	-	-	-	-	-	-	122	159	-	129	158	-
Stage 1	-	-	-	-	-	-	552	537	-	395	397	-
Stage 2	-	-	-	-	-	-	335	386	-	497	520	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.6			0.9			55.4			37.9		
HCM LOS							F			E		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	178	948	-	-	1110	-	-	191
HCM Lane V/C Ratio	0.639	0.033	-	-	0.062	-	-	0.441
HCM Control Delay (s)	55.4	8.9	-	-	8.5	-	-	37.9
HCM Lane LOS	F	A	-	-	A	-	-	E
HCM 95th %tile Q(veh)	3.6	0.1	-	-	0.2	-	-	2.1

HCM 6th Signalized Intersection Summary 3: Range Ave & W Steele Ln

Lance Drive Residential TIA
Cumulative Plus Project PM (95-120 Seconds)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	371	81	70	502	60	102	240	50	70	510	60
Future Volume (veh/h)	50	371	81	70	502	60	102	240	50	70	510	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.97	1.00		0.93
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	52	386	79	73	523	60	106	250	34	73	531	51
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	441	925	189	525	1015	116	133	482	65	183	623	60
Arrive On Green	0.62	0.62	0.62	0.62	0.62	0.62	0.08	0.16	0.16	0.10	0.19	0.19
Sat Flow, veh/h	825	1489	305	919	1633	187	1767	3109	417	1767	3227	309
Grp Volume(v), veh/h	52	0	465	73	0	583	106	140	144	73	289	293
Grp Sat Flow(s),veh/h/ln	825	0	1794	919	0	1821	1767	1763	1763	1767	1763	1773
Q Serve(g_s), s	3.6	0.0	12.6	4.2	0.0	17.0	5.6	6.9	7.1	3.7	15.0	15.2
Cycle Q Clear(g_c), s	20.5	0.0	12.6	16.8	0.0	17.0	5.6	6.9	7.1	3.7	15.0	15.2
Prop In Lane	1.00		0.17	1.00		0.10	1.00		0.24	1.00		0.17
Lane Grp Cap(c), veh/h	441	0	1114	525	0	1131	133	273	273	183	340	342
V/C Ratio(X)	0.12	0.00	0.42	0.14	0.00	0.52	0.80	0.51	0.53	0.40	0.85	0.86
Avail Cap(c_a), veh/h	441	0	1114	525	0	1131	223	466	466	205	447	450
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.32	0.32	0.32	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.7	0.0	9.2	13.5	0.0	10.0	43.2	36.8	36.9	39.8	37.0	37.1
Incr Delay (d2), s/veh	0.5	0.0	1.2	0.6	0.0	1.7	1.3	0.2	0.2	0.5	9.2	9.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	4.7	0.9	0.0	6.4	2.4	2.9	3.0	1.6	7.1	7.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.3	0.0	10.4	14.0	0.0	11.7	44.5	37.0	37.1	40.3	46.2	46.8
LnGrp LOS	B	A	B	B	A	B	D	D	D	D	D	D
Approach Vol, veh/h	517			656			390			655		
Approach Delay, s/veh	11.0			12.0			39.1			45.8		
Approach LOS	B			B			D			D		
Timer - Assigned Phs	2		3	4		6	7	8				
Phs Duration (G+Y+Rc), s	62.6		10.2	22.2		62.6	13.8	18.6				
Change Period (Y+Rc), s	3.6		3.0	3.9		3.6	3.9	* 3.9				
Max Green Setting (Gmax), s	48.4		12.0	24.1		48.4	11.0	* 25				
Max Q Clear Time (g_c+I1), s	22.5		7.6	17.2		19.0	5.7	9.1				
Green Ext Time (p_c), s	1.1		0.0	0.7		1.4	0.0	0.4				
Intersection Summary												
HCM 6th Ctrl Delay	26.5											
HCM 6th LOS	C											
Notes												











* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary

4: Marlow Rd & Guerneville Rd

Lance Drive Residential TIA
Cumulative Plus Project PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	200	506	150	330	556	141	160	720	223	81	840	90
Future Volume (veh/h)	200	506	150	330	556	141	160	720	223	81	840	90
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	211	533	78	347	585	129	168	758	147	85	884	88
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	218	690	445	280	674	148	162	908	646	232	961	96
Arrive On Green	0.12	0.20	0.20	0.16	0.24	0.24	0.09	0.26	0.26	0.13	0.30	0.30
Sat Flow, veh/h	1767	3526	1538	1767	2860	629	1767	3526	1539	1767	3232	322
Grp Volume(v), veh/h	211	533	78	347	360	354	168	758	147	85	482	490
Grp Sat Flow(s),veh/h/ln	1767	1763	1538	1767	1763	1725	1767	1763	1539	1767	1763	1791
Q Serve(g_s), s	11.3	13.6	1.8	15.1	18.6	18.7	8.7	19.3	0.0	4.2	25.1	25.1
Cycle Q Clear(g_c), s	11.3	13.6	1.8	15.1	18.6	18.7	8.7	19.3	0.0	4.2	25.1	25.1
Prop In Lane	1.00		1.00	1.00		0.36	1.00		1.00	1.00		0.18
Lane Grp Cap(c), veh/h	218	690	445	280	415	406	162	908	646	232	524	533
V/C Ratio(X)	0.97	0.77	0.18	1.24	0.87	0.87	1.04	0.83	0.23	0.37	0.92	0.92
Avail Cap(c_a), veh/h	218	865	521	280	447	438	162	1054	710	232	536	545
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.95	0.95	0.95	0.46	0.46	0.46	0.63	0.63	0.63
Uniform Delay (d), s/veh	41.5	36.2	8.6	40.0	34.9	34.9	43.2	33.4	17.9	37.6	32.3	32.3
Incr Delay (d2), s/veh	52.1	3.4	0.2	132.5	20.1	20.9	58.2	2.5	0.1	0.6	14.8	14.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.9	5.9	0.8	16.6	9.9	9.9	6.3	8.2	2.0	1.8	12.4	12.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	93.6	39.6	8.8	172.5	54.9	55.8	101.4	35.8	17.9	38.2	47.0	46.9
LnGrp LOS	F	D	A	F	D	E	F	D	B	D	D	D
Approach Vol, veh/h	822			1061			1073			1057		
Approach Delay, s/veh	50.5			93.7			43.6			46.3		
Approach LOS	D			F			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	20.8	24.3	14.0	33.6	17.0	28.1	17.8	29.8				
Change Period (Y+Rc), s	5.7	* 5.7	5.3	5.3	5.3	5.7	5.3	5.3				
Max Green Setting (Gmax), s	22.5	* 23	8.7	28.9	11.7	24.1	9.2	28.4				
Max Q Clear Time (g_c+I1), s	15.6	15.6	10.7	27.1	13.3	20.7	6.2	21.3				
Green Ext Time (p_c), s	0.0	2.2	0.0	1.0	0.0	1.3	0.0	3.0				

Intersection Summary

HCM 6th Ctrl Delay 59.0

HCM 6th LOS E

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary

5: Ridley Ave & Guerneville Rd

Lance Drive Residential TIA
Cumulative Plus Project PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	800	40	84	977	20	20	10	57	20	10	20
Future Volume (veh/h)	20	800	40	84	977	20	20	10	57	20	10	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	22	860	42	90	1051	22	22	11	10	22	11	0
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	527	2963	145	579	3057	64	96	36	23	117	46	0
Arrive On Green	0.87	0.87	0.87	1.00	1.00	1.00	0.06	0.06	0.06	0.06	0.06	0.00
Sat Flow, veh/h	521	3421	167	613	3529	74	636	587	371	882	748	0
Grp Volume(v), veh/h	22	443	459	90	525	548	43	0	0	33	0	0
Grp Sat Flow(s),veh/h/ln	521	1763	1825	613	1763	1840	1594	0	0	1629	0	0
Q Serve(g_s), s	0.6	4.3	4.3	0.9	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.6	4.3	4.3	5.1	0.0	0.0	2.3	0.0	0.0	1.6	0.0	0.0
Prop In Lane	1.00		0.09	1.00		0.04	0.51		0.23	0.67		0.00
Lane Grp Cap(c), veh/h	527	1527	1581	579	1527	1594	155	0	0	163	0	0
V/C Ratio(X)	0.04	0.29	0.29	0.16	0.34	0.34	0.28	0.00	0.00	0.20	0.00	0.00
Avail Cap(c_a), veh/h	527	1527	1581	579	1527	1594	526	0	0	530	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.81	0.81	0.81	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.9	1.1	1.1	0.1	0.0	0.0	42.9	0.0	0.0	42.6	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.4	0.4	0.0	0.0	0.0	0.4	0.0	0.0	0.2	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.3	0.3	0.0	0.0	0.0	1.0	0.0	0.0	0.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	1.0	1.5	1.5	0.2	0.0	0.0	43.3	0.0	0.0	42.9	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	D	A	A	D	A	A
Approach Vol, veh/h	924			1163			43			33		
Approach Delay, s/veh	1.5			0.1			43.3			42.9		
Approach LOS	A			A			D			D		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	86.2			8.8			86.2			8.8		
Change Period (Y+Rc), s	3.9			3.0			3.9			3.0		
Max Green Setting (Gmax), s	59.1			29.0			59.1			29.0		
Max Q Clear Time (g_c+I1), s	6.3			3.6			7.1			4.3		
Green Ext Time (p_c), s	1.9			0.1			2.6			0.1		

Intersection Summary

HCM 6th Ctrl Delay	2.2
HCM 6th LOS	A

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary 6: Lance Dr & Guerneville Rd

Lance Drive Residential TIA
Cumulative Plus Project PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	118	693	20	70	1040	248	10	43	50	141	48	76
Future Volume (veh/h)	118	693	20	70	1040	248	10	43	50	141	48	76
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.99	0.99		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	123	722	20	73	1083	241	10	45	15	147	50	67
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	151	791	22	330	1153	502	69	254	76	224	64	78
Arrive On Green	0.11	0.30	0.30	0.25	0.44	0.44	0.20	0.20	0.20	0.20	0.20	0.20
Sat Flow, veh/h	1767	3501	97	1767	3526	1536	128	1251	376	815	316	384
Grp Volume(v), veh/h	123	363	379	73	1083	241	70	0	0	264	0	0
Grp Sat Flow(s), veh/h/ln	1767	1763	1836	1767	1763	1536	1756	0	0	1514	0	0
Q Serve(g_s), s	6.5	18.9	18.9	3.1	27.9	10.6	0.0	0.0	0.0	12.8	0.0	0.0
Cycle Q Clear(g_c), s	6.5	18.9	18.9	3.1	27.9	10.6	3.1	0.0	0.0	15.8	0.0	0.0
Prop In Lane	1.00		0.05	1.00		1.00	0.14		0.21	0.56		0.25
Lane Grp Cap(c), veh/h	151	398	415	330	1153	502	399	0	0	366	0	0
V/C Ratio(X)	0.81	0.91	0.91	0.22	0.94	0.48	0.18	0.00	0.00	0.72	0.00	0.00
Avail Cap(c_a), veh/h	162	737	767	330	1473	642	613	0	0	553	0	0
HCM Platoon Ratio	1.33	1.33	1.33	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.80	0.80	0.80	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	41.4	32.3	32.3	30.2	25.9	21.1	31.4	0.0	0.0	36.2	0.0	0.0
Incr Delay (d2), s/veh	22.8	3.5	3.4	0.1	13.1	2.6	0.1	0.0	0.0	1.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	7.4	7.7	1.3	11.7	3.7	1.3	0.0	0.0	6.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	64.1	35.8	35.7	30.3	39.0	23.7	31.5	0.0	0.0	37.3	0.0	0.0
LnGrp LOS	E	D	D	C	D	C	C	A	A	D	A	A
Approach Vol, veh/h	865			1397			70			264		
Approach Delay, s/veh	39.8			35.9			31.5			37.3		
Approach LOS	D			D			C			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	23.0	26.8		23.9	13.4	36.4		23.9				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		4.6				
Max Green Setting (Gmax), s	39.7	39.7		31.4	8.7	39.7		31.4				
Max Q Clear Time (g_c+15), s	20.9	20.9		17.8	8.5	29.9		5.1				
Green Ext Time (p_c), s	0.0	0.6		0.3	0.0	1.2		0.1				

Intersection Summary

HCM 6th Ctrl Delay 37.2

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

7: N Dutton Ave/Westberry Dr & Guerneville Rd

Lance Drive Residential TIA
Cumulative Plus Project PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	799	145	530	1077	30	221	10	520	10	10	10
Future Volume (veh/h)	10	799	145	530	1077	30	221	10	520	10	10	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.99	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	11	859	148	570	1158	31	246	0	208	11	11	7
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	28	801	138	1409	2321	62	212	0	740	30	30	19
Arrive On Green	0.02	0.27	0.27	0.41	0.66	0.66	0.06	0.00	0.06	0.05	0.05	0.05
Sat Flow, veh/h	1767	2996	516	3428	3505	94	3534	0	1557	658	658	419
Grp Volume(v), veh/h	11	505	502	570	582	607	246	0	208	29	0	0
Grp Sat Flow(s), veh/h/ln	1767	1763	1749	1714	1763	1836	1767	0	1557	1736	0	0
Q Serve(g_s), s	0.6	25.4	25.4	11.2	15.8	15.8	5.7	0.0	0.0	1.5	0.0	0.0
Cycle Q Clear(g_c), s	0.6	25.4	25.4	11.2	15.8	15.8	5.7	0.0	0.0	1.5	0.0	0.0
Prop In Lane	1.00		0.30	1.00		0.05	1.00		1.00	0.38		0.24
Lane Grp Cap(c), veh/h	28	471	468	1409	1168	1216	212	0	740	80	0	0
V/C Ratio(X)	0.39	1.07	1.07	0.40	0.50	0.50	1.16	0.00	0.28	0.36	0.00	0.00
Avail Cap(c_a), veh/h	112	471	468	1409	1168	1216	212	0	740	506	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.91	0.91	0.91	0.37	0.37	0.37	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	46.3	34.8	34.8	19.8	8.1	8.1	44.7	0.0	15.3	44.0	0.0	0.0
Incr Delay (d2), s/veh	3.0	60.4	60.5	0.0	0.6	0.5	111.7	0.0	0.1	1.0	0.0	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	18.2	18.1	4.2	5.0	5.2	5.7	0.0	2.6	0.7	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.3	95.2	95.3	19.8	8.7	8.6	156.3	0.0	15.4	45.0	0.0	0.0
LnGrp LOS	D	F	F	B	A	A	F	A	B	D	A	A
Approach Vol, veh/h	1018			1759			454			29		
Approach Delay, s/veh	94.8			12.3			91.8			45.0		
Approach LOS	F			B			F			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	44.3	30.7		9.0	6.8	68.2		11.0				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		5.3				
Max Green Setting (Gmax), s	55.8	25.4		27.7	6.0	35.1		5.7				
Max Q Clear Time (g_c+I1), s	113.2	27.4		3.5	2.6	17.8		7.7				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	1.0		0.0				

Intersection Summary

HCM 6th Ctrl Delay 49.4

HCM 6th LOS D

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 8: Herbert St/Coffey Ln & Guerneville Rd

Lance Drive Residential TIA
Cumulative Plus Project PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	201	1048	70	60	1357	110	50	30	40	120	30	270
Future Volume (veh/h)	201	1048	70	60	1357	110	50	30	40	120	30	270
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.99	1.00		0.94	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	218	1139	72	65	1475	116	54	33	26	130	33	94
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	181	1107	70	456	1605	125	88	54	42	186	47	356
Arrive On Green	0.10	0.33	0.33	0.26	0.48	0.48	0.11	0.11	0.11	0.13	0.13	0.13
Sat Flow, veh/h	1767	3358	212	1767	3310	259	819	501	394	1423	361	1491
Grp Volume(v), veh/h	218	597	614	65	782	809	113	0	0	163	0	94
Grp Sat Flow(s), veh/h/ln	1767	1763	1807	1767	1763	1806	1714	0	0	1784	0	1491
Q Serve(g_s), s	11.8	37.9	37.9	3.3	47.2	48.1	7.2	0.0	0.0	10.1	0.0	5.9
Cycle Q Clear(g_c), s	11.8	37.9	37.9	3.3	47.2	48.1	7.2	0.0	0.0	10.1	0.0	5.9
Prop In Lane	1.00		0.12	1.00		0.14	0.48		0.23	0.80		1.00
Lane Grp Cap(c), veh/h	181	581	596	456	855	876	184	0	0	233	0	356
V/C Ratio(X)	1.20	1.03	1.03	0.14	0.91	0.92	0.61	0.00	0.00	0.70	0.00	0.26
Avail Cap(c_a), veh/h	181	581	596	456	855	876	373	0	0	403	0	499
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.73	0.73	0.73	0.62	0.62	0.62	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	51.6	38.5	38.6	32.9	27.4	27.7	49.1	0.0	0.0	47.9	0.0	36.1
Incr Delay (d2), s/veh	122.9	39.4	39.5	0.0	10.9	11.6	1.2	0.0	0.0	1.4	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	22.0	22.6	1.4	21.0	22.1	3.2	0.0	0.0	4.5	0.0	2.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	174.5	77.9	78.0	32.9	38.3	39.3	50.3	0.0	0.0	49.3	0.0	36.2
LnGrp LOS	F	F	F	C	D	D	D	A	A	D	A	D
Approach Vol, veh/h	1429			1656			113			257		
Approach Delay, s/veh	92.7			38.6			50.3			44.5		
Approach LOS	F			D			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	35.0	43.2		19.9	17.1	61.1		16.9				
Change Period (Y+Rc), s	5.3	5.3		4.9	5.3	5.3		4.6				
Max Green Setting (Gmax), s	60.0	37.9		26.0	11.8	32.1		25.0				
Max Q Clear Time (g_c+1/3), s	15.3	39.9		12.1	13.8	50.1		9.2				
Green Ext Time (p_c), s	0.0	0.0		0.1	0.0	0.0		0.1				

Intersection Summary

HCM 6th Ctrl Delay	61.8
HCM 6th LOS	E

HCM 6th Signalized Intersection Summary

9: Range Ave & Guerneville Rd

Lance Drive Residential TIA
Cumulative Plus Project PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	180	756	242	100	954	22	333	190	170	101	270	290
Future Volume (veh/h)	180	756	242	100	954	22	333	190	170	101	270	290
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	188	788	0	104	994	0	216	382	102	105	281	141
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	351	1528		112	1051		324	517	136	184	235	114
Arrive On Green	0.20	0.43	0.00	0.06	0.30	0.00	0.18	0.18	0.18	0.03	0.03	0.03
Sat Flow, veh/h	1767	3618	0	1767	3618	0	1767	2816	741	1767	2256	1090
Grp Volume(v), veh/h	188	788	0	104	994	0	216	250	234	105	217	205
Grp Sat Flow(s), veh/h/ln	1767	1763	0	1767	1763	0	1767	1856	1702	1767	1763	1584
Q Serve(g_s), s	9.1	15.5	0.0	5.6	26.2	0.0	10.8	12.1	12.4	5.6	9.9	9.9
Cycle Q Clear(g_c), s	9.1	15.5	0.0	5.6	26.2	0.0	10.8	12.1	12.4	5.6	9.9	9.9
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.44	1.00		0.69
Lane Grp Cap(c), veh/h	351	1528		112	1051		324	340	312	184	184	165
V/C Ratio(X)	0.54	0.52		0.93	0.95		0.67	0.73	0.75	0.57	1.18	1.24
Avail Cap(c_a), veh/h	351	1528		112	1058		560	588	539	184	184	165
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	0.74	0.74	0.00	0.87	0.87	0.00	1.00	1.00	1.00	0.56	0.56	0.56
Uniform Delay (d), s/veh	34.2	19.6	0.0	44.3	32.6	0.0	36.1	36.6	36.7	43.8	45.9	45.9
Incr Delay (d2), s/veh	0.6	0.9	0.0	58.0	14.5	0.0	0.9	1.2	1.4	1.5	108.9	133.8
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	6.1	0.0	4.2	12.8	0.0	4.7	5.5	5.2	2.5	10.1	10.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.8	20.6	0.0	102.3	47.1	0.0	37.0	37.8	38.1	45.3	154.8	179.7
LnGrp LOS	C	C		F	D		D	D	D	D	F	F
Approach Vol, veh/h	976		A	1098		A	700			527		
Approach Delay, s/veh	23.3			52.3			37.6			142.7		
Approach LOS	C			D			D			F		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	1.3	46.5		15.2	24.1	33.6		22.0				
Change Period (Y+Rc), s	5.3	5.3		5.3	5.3	5.3		4.6				
Max Green Setting (Gmax), s	6.0	28.5		9.9	6.0	28.5		30.1				
Max Q Clear Time (g_c+11), s	6.0	17.5		11.9	11.1	28.2		14.4				
Green Ext Time (p_c), s	0.0	0.9		0.0	0.0	0.1		0.4				

Intersection Summary

HCM 6th Ctrl Delay 55.0

HCM 6th LOS E

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

10: Guerneville Rd & Steele Wy

Lance Drive Residential TIA
Cumulative Plus Project PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	885	122	160	963	12	83	50	190	381	60	30
Future Volume (veh/h)	20	885	122	160	963	12	83	50	190	381	60	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	20	903	97	163	983	12	68	75	102	433	0	15
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	548	1818	949	221	963	12	169	177	249	526	0	715
Arrive On Green	0.31	0.52	0.52	0.06	0.27	0.27	0.10	0.10	0.10	0.15	0.00	0.15
Sat Flow, veh/h	1767	3526	1550	3428	3567	44	1767	1856	1538	3534	0	1530
Grp Volume(v), veh/h	20	903	97	163	486	509	68	75	102	433	0	15
Grp Sat Flow(s), veh/h/ln	1767	1763	1550	1714	1763	1847	1767	1856	1538	1767	0	1530
Q Serve(g_s), s	0.9	18.3	2.9	5.1	29.7	29.7	4.0	4.2	6.6	13.1	0.0	0.0
Cycle Q Clear(g_c), s	0.9	18.3	2.9	5.1	29.7	29.7	4.0	4.2	6.6	13.1	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.02	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	548	1818	949	221	476	499	169	177	249	526	0	715
V/C Ratio(X)	0.04	0.50	0.10	0.74	1.02	1.02	0.40	0.42	0.41	0.82	0.00	0.02
Avail Cap(c_a), veh/h	548	1818	949	221	476	499	434	455	479	868	0	863
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.66	0.66	0.66	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	26.5	17.4	8.9	50.5	40.1	40.2	46.8	46.9	41.5	45.4	0.0	16.3
Incr Delay (d2), s/veh	0.0	0.6	0.1	10.7	46.6	45.7	0.6	0.6	0.4	1.3	0.0	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	0.4	7.2	1.2	2.5	18.7	19.4	1.8	2.0	2.5	5.8	0.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	26.5	18.0	9.0	61.3	86.8	85.8	47.4	47.5	41.9	46.7	0.0	16.3
LnGrp LOS	C	B	A	E	F	F	D	D	D	D	A	B
Approach Vol, veh/h	1020			1158			245			448		
Approach Delay, s/veh	17.3			82.8			45.1			45.6		
Approach LOS	B			F			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	2.0	61.6		21.3	39.0	34.6		15.1				
Change Period (Y+Rc), s	4.9	4.9		4.9	4.9	4.9		4.6				
Max Green Setting (Gmax), s	29.6			27.0	7.0	29.7		27.0				
Max Q Clear Time (g_c+11), s	20.3			15.1	2.9	31.7		8.6				
Green Ext Time (p_c), s	0.0	1.1		0.1	0.0	0.0		0.1				

Intersection Summary

HCM 6th Ctrl Delay 50.5

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

11: Cleveland Ave & Guerneville Rd

Lance Drive Residential TIA
Cumulative Plus Project PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↑↑↑		↔↔	↑↑	↔	↔	↑↑		↔	↑↑	
Traffic Volume (veh/h)	140	1246	90	370	1465	240	110	160	280	490	410	140
Future Volume (veh/h)	140	1246	90	370	1465	240	110	160	280	490	410	140
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.98	1.00		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	146	1298	86	385	1526	184	115	167	98	355	644	127
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	247	1494	99	456	1303	569	200	245	135	422	715	141
Arrive On Green	0.07	0.31	0.31	0.04	0.12	0.12	0.11	0.11	0.11	0.24	0.24	0.24
Sat Flow, veh/h	3428	4844	321	3428	3526	1539	1767	2164	1193	1767	2995	590
Grp Volume(v), veh/h	146	905	479	385	1526	184	115	134	131	355	398	373
Grp Sat Flow(s), veh/h/ln	1714	1689	1788	1714	1763	1539	1767	1763	1595	1767	1856	1730
Q Serve(g_s), s	3.9	24.0	24.1	10.6	35.1	10.4	5.9	6.9	7.5	18.2	19.8	19.9
Cycle Q Clear(g_c), s	3.9	24.0	24.1	10.6	35.1	10.4	5.9	6.9	7.5	18.2	19.8	19.9
Prop In Lane	1.00		0.18	1.00		1.00	1.00		0.75	1.00		0.34
Lane Grp Cap(c), veh/h	247	1042	551	456	1303	569	200	200	181	422	443	413
V/C Ratio(X)	0.59	0.87	0.87	0.84	1.17	0.32	0.57	0.67	0.72	0.84	0.90	0.90
Avail Cap(c_a), veh/h	256	1042	551	798	1303	569	200	200	181	467	490	457
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.39	0.39	0.39	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.7	31.0	31.0	44.4	41.7	30.9	39.9	40.4	40.7	34.5	35.1	35.1
Incr Delay (d2), s/veh	2.2	7.7	13.4	0.7	80.7	0.0	11.4	16.5	22.2	11.0	17.3	18.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	10.5	11.9	4.8	31.0	4.2	3.2	3.9	4.0	8.8	10.7	10.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.9	38.7	44.4	45.1	122.4	30.9	51.3	56.9	62.9	45.4	52.4	53.8
LnGrp LOS	D	D	D	D	F	C	D	E	E	D	D	D
Approach Vol, veh/h	1530			2095			380			1126		
Approach Delay, s/veh	41.1			100.2			57.3			50.6		
Approach LOS	D			F			E			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.5	34.2		15.7	11.8	40.0		27.6				
Change Period (Y+Rc), s	4.9	4.9		4.9	4.9	4.9		4.9				
Max Green Setting (Gmax), s	22.5	20.1		8.1	7.1	35.1		25.1				
Max Q Clear Time (g_c+I1), s	11.6	26.1		9.5	5.9	37.1		21.9				
Green Ext Time (p_c), s	0.1	0.0		0.0	0.0	0.0		0.4				

Intersection Summary

HCM 6th Ctrl Delay 68.5

HCM 6th LOS E

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 12: US 101 SB Ramps & Guerneville Rd

Lance Drive Residential TIA
Cumulative Plus Project PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑					↑	↑	↑
Traffic Volume (veh/h)	0	1379	667	350	1662	0	0	0	0	350	80	423
Future Volume (veh/h)	0	1379	667	350	1662	0	0	0	0	350	80	423
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1856	1856	1856	1856	0				1856	1856	1856
Adj Flow Rate, veh/h	0	1422	297	361	1713	0				420	0	402
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	1692	508	426	1798	0				1379	0	613
Arrive On Green	0.00	0.33	0.33	0.12	0.51	0.00				0.39	0.00	0.39
Sat Flow, veh/h	0	5233	1521	3428	3618	0				3534	0	1572
Grp Volume(v), veh/h	0	1422	297	361	1713	0				420	0	402
Grp Sat Flow(s),veh/h/ln	0	1689	1521	1714	1763	0				1767	0	1572
Q Serve(g_s), s	0.0	24.7	15.4	9.8	44.0	0.0				7.8	0.0	19.9
Cycle Q Clear(g_c), s	0.0	24.7	15.4	9.8	44.0	0.0				7.8	0.0	19.9
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1692	508	426	1798	0				1379	0	613
V/C Ratio(X)	0.00	0.84	0.58	0.85	0.95	0.00				0.30	0.00	0.66
Avail Cap(c_a), veh/h	0	1925	578	516	2052	0				1379	0	613
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.26	0.26	0.45	0.45	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	29.3	26.2	40.7	22.2	0.0				20.1	0.0	23.7
Incr Delay (d2), s/veh	0.0	0.7	0.1	4.4	5.1	0.0				0.6	0.0	5.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	9.7	5.4	4.3	17.6	0.0				3.1	0.0	7.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	30.0	26.3	45.1	27.3	0.0				20.6	0.0	29.1
LnGrp LOS	A	C	C	D	C	A				C	A	C
Approach Vol, veh/h		1719			2074						822	
Approach Delay, s/veh		29.4			30.4						24.8	
Approach LOS		C			C						C	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	6.7	36.6		41.7		53.3						
Change Period (Y+Rc), s	4.9	4.9		4.6		4.9						
Max Green Setting (Gmax), s	4.3	36.1		30.2		55.3						
Max Q Clear Time (g_c+I1), s	11.8	26.7		21.9		46.0						
Green Ext Time (p_c), s	0.0	1.9		0.1		2.4						

Intersection Summary

HCM 6th Ctrl Delay	29.0
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 13: US 101 NB Ramps & Guerneville Rd/Steele Ln

Lance Drive Residential TIA
Cumulative Plus Project PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↑↑			↑↑↑		↰	↰↱	↰			
Traffic Volume (veh/h)	501	1228	0	0	1193	280	819	10	400	0	0	0
Future Volume (veh/h)	501	1228	0	0	1193	280	819	10	400	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1856	1856	0	0	1856	1856	1856	1856	1856			
Adj Flow Rate, veh/h	522	1279	0	0	1243	265	966	0	236			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	3	3	0	0	3	3	3	3	3			
Cap, veh/h	812	2152	0	0	1340	286	1024	0	455			
Arrive On Green	0.47	1.00	0.00	0.00	0.32	0.32	0.29	0.00	0.29			
Sat Flow, veh/h	3428	3618	0	0	4330	887	3534	0	1572			
Grp Volume(v), veh/h	522	1279	0	0	1008	500	966	0	236			
Grp Sat Flow(s),veh/h/ln	1714	1763	0	0	1689	1673	1767	0	1572			
Q Serve(g_s), s	10.9	0.0	0.0	0.0	27.4	27.4	25.4	0.0	11.9			
Cycle Q Clear(g_c), s	10.9	0.0	0.0	0.0	27.4	27.4	25.4	0.0	11.9			
Prop In Lane	1.00		0.00	0.00		0.53	1.00		1.00			
Lane Grp Cap(c), veh/h	812	2152	0	0	1087	539	1024	0	455			
V/C Ratio(X)	0.64	0.59	0.00	0.00	0.93	0.93	0.94	0.00	0.52			
Avail Cap(c_a), veh/h	812	2152	0	0	1177	583	1168	0	520			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.62	0.62	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	21.9	0.0	0.0	0.0	31.1	31.1	33.0	0.0	28.2			
Incr Delay (d2), s/veh	0.8	0.8	0.0	0.0	11.5	19.7	13.2	0.0	0.3			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	3.5	0.2	0.0	0.0	12.4	13.5	12.0	0.0	4.3			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.8	0.8	0.0	0.0	42.7	50.8	46.2	0.0	28.5			
LnGrp LOS	C	A	A	A	D	D	D	A	C			
Approach Vol, veh/h	1801			1508			1202					
Approach Delay, s/veh	7.1			45.4			42.7					
Approach LOS	A			D			D					
Timer - Assigned Phs	2			5			6			8		
Phs Duration (G+Y+Rc), s	62.9			27.4			35.5			32.1		
Change Period (Y+Rc), s	4.9			4.9			4.9			4.6		
Max Green Setting (Gmax), s	54.1			16.1			33.1			31.4		
Max Q Clear Time (g_c+I1), s	2.0			12.9			29.4			27.4		
Green Ext Time (p_c), s	1.9			0.1			1.2			0.1		

Intersection Summary

HCM 6th Ctrl Delay	29.4
HCM 6th LOS	C










Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 14: Stony Point Rd/Marlow Rd & W College Ave

Lance Drive Residential TIA
Cumulative Plus Project PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	93	290	130	264	400	230	190	910	306	190	982	128
Future Volume (veh/h)	93	290	130	264	400	230	190	910	306	190	982	128
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	98	305	97	278	421	176	200	958	199	200	1034	124
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	238	388	121	352	513	212	235	1094	792	212	941	113
Arrive On Green	0.13	0.15	0.15	0.20	0.21	0.21	0.13	0.31	0.31	0.12	0.30	0.30
Sat Flow, veh/h	1767	2632	820	1767	2420	1000	1767	3526	1545	1767	3163	379
Grp Volume(v), veh/h	98	202	200	278	305	292	200	958	199	200	576	582
Grp Sat Flow(s),veh/h/ln	1767	1763	1689	1767	1763	1657	1767	1763	1545	1767	1763	1780
Q Serve(g_s), s	4.8	10.5	10.9	14.2	15.7	16.0	10.5	24.4	2.9	10.7	28.3	28.3
Cycle Q Clear(g_c), s	4.8	10.5	10.9	14.2	15.7	16.0	10.5	24.4	2.9	10.7	28.3	28.3
Prop In Lane	1.00		0.49	1.00		0.60	1.00		1.00	1.00		0.21
Lane Grp Cap(c), veh/h	238	260	249	352	374	351	235	1094	792	212	524	530
V/C Ratio(X)	0.41	0.78	0.80	0.79	0.82	0.83	0.85	0.88	0.25	0.94	1.10	1.10
Avail Cap(c_a), veh/h	238	328	315	352	388	364	292	1176	829	212	524	530
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.11	0.11	0.11	1.00	1.00	1.00	0.24	0.24	0.24
Uniform Delay (d), s/veh	37.7	39.0	39.1	36.2	35.7	35.8	40.3	31.0	3.9	41.5	33.4	33.4
Incr Delay (d2), s/veh	1.1	8.8	11.1	1.4	1.5	1.8	17.7	7.3	0.2	18.0	51.9	52.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	5.0	5.1	6.0	6.6	6.4	5.6	10.9	1.1	5.5	18.9	19.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.8	47.8	50.3	37.6	37.2	37.6	58.0	38.3	4.1	59.5	85.2	85.8
LnGrp LOS	D	D	D	D	D	D	E	D	A	E	F	F
Approach Vol, veh/h	500			875			1357			1358		
Approach Delay, s/veh	47.0			37.5			36.2			81.7		
Approach LOS	D			D			D			F		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	24.2	19.3	17.9	33.6	18.1	25.4	16.7	34.8				
Change Period (Y+Rc), s	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3				
Max Green Setting (Gmax), s	17.7	17.7	15.7	27.4	9.8	20.9	11.4	31.7				
Max Q Clear Time (g_c+I16), s	12.9	12.9	12.5	30.3	6.8	18.0	12.7	26.4				
Green Ext Time (p_c), s	0.0	0.9	0.2	0.0	0.1	1.0	0.0	3.0				

Intersection Summary

HCM 6th Ctrl Delay 52.9

HCM 6th LOS D









Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary 15: N Dutton Ave & W College Ave

Lance Drive Residential TIA
Cumulative Plus Project PM (95-120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	670	120	220	900	213	170	406	150	365	596	160
Future Volume (veh/h)	100	670	120	220	900	213	170	406	150	365	596	160
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	104	698	113	229	938	207	177	423	121	380	621	141
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	130	737	119	260	934	206	285	503	142	474	834	189
Arrive On Green	0.07	0.24	0.24	0.15	0.33	0.33	0.16	0.19	0.19	0.27	0.29	0.29
Sat Flow, veh/h	1767	3030	490	1767	2862	631	1767	2699	764	1767	2844	644
Grp Volume(v), veh/h	104	406	405	229	577	568	177	275	269	380	384	378
Grp Sat Flow(s),veh/h/ln	1767	1763	1758	1767	1763	1730	1767	1763	1700	1767	1763	1725
Q Serve(g_s), s	5.5	21.5	21.5	12.1	31.0	31.0	8.9	14.3	14.5	19.0	18.7	18.8
Cycle Q Clear(g_c), s	5.5	21.5	21.5	12.1	31.0	31.0	8.9	14.3	14.5	19.0	18.7	18.8
Prop In Lane	1.00		0.28	1.00		0.36	1.00		0.45	1.00		0.37
Lane Grp Cap(c), veh/h	130	429	427	260	575	565	285	328	317	474	517	506
V/C Ratio(X)	0.80	0.95	0.95	0.88	1.00	1.01	0.62	0.84	0.85	0.80	0.74	0.75
Avail Cap(c_a), veh/h	130	429	427	260	575	565	318	408	394	474	517	506
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.71	0.71	0.71	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.3	35.3	35.4	39.7	32.0	32.0	37.1	37.3	37.4	32.4	30.3	30.4
Incr Delay (d2), s/veh	20.1	23.9	24.2	26.4	38.4	39.3	1.9	9.8	11.5	8.8	5.1	5.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	11.7	11.7	7.0	18.6	18.4	3.9	6.9	6.9	8.9	8.3	8.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	63.4	59.3	59.6	66.0	70.4	71.3	39.0	47.1	48.9	41.2	35.5	35.7
LnGrp LOS	E	E	E	E	F	F	D	D	D	D	D	D
Approach Vol, veh/h	915			1374			721			1142		
Approach Delay, s/veh	59.9			70.0			45.8			37.4		
Approach LOS	E			E			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.9	27.0	18.3	31.8	10.0	34.9	28.5	21.6				
Change Period (Y+Rc), s	3.9	* 3.9	3.0	3.9	3.0	3.9	3.0	3.9				
Max Green Setting (Gmax), s	4.0	* 23	17.1	27.0	7.0	30.1	22.1	22.0				
Max Q Clear Time (g_c+14, s)	14.5	23.5	10.9	20.8	7.5	33.0	21.0	16.5				
Green Ext Time (p_c), s	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.7				

Intersection Summary

HCM 6th Ctrl Delay 54.6

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Intersection Delay, s/veh	9
Intersection LOS	A




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	7	50	0	62	78	109	0	6	36	95	7	13
Future Vol, veh/h	7	50	0	62	78	109	0	6	36	95	7	13
Peak Hour Factor	0.86	0.86	0.92	0.92	0.86	0.86	0.92	0.92	0.92	0.86	0.92	0.86
Heavy Vehicles, %	3	3	2	2	3	3	2	2	2	3	2	3
Mvmt Flow	8	58	0	67	91	127	0	7	39	110	8	15
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.2	9.4	7.7	9
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	12%	25%	83%
Vol Thru, %	14%	88%	31%	6%
Vol Right, %	86%	0%	44%	11%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	42	57	249	115
LT Vol	0	7	62	95
Through Vol	6	50	78	7
RT Vol	36	0	109	13
Lane Flow Rate	46	66	285	133
Geometry Grp	1	1	1	1
Degree of Util (X)	0.055	0.087	0.335	0.181
Departure Headway (Hd)	4.373	4.716	4.235	4.881
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	817	759	849	735
Service Time	2.411	2.748	2.258	2.914
HCM Lane V/C Ratio	0.056	0.087	0.336	0.181
HCM Control Delay	7.7	8.2	9.4	9
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.2	0.3	1.5	0.7




HCM 6th TWSC
17: Iroquois St & Project Driveway (1)

Lance Drive Residential TIA
Cumulative Plus Project PM (95-120 Seconds)

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	5	8	107	106	3
Future Vol, veh/h	1	5	8	107	106	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	5	9	116	115	3
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	251	117	118	0	-	0
Stage 1	117	-	-	-	-	-
Stage 2	134	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	738	935	1470	-	-	-
Stage 1	908	-	-	-	-	-
Stage 2	892	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	733	935	1470	-	-	-
Mov Cap-2 Maneuver	733	-	-	-	-	-
Stage 1	902	-	-	-	-	-
Stage 2	892	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	9.1	0.5		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1470	-	894	-	-	
HCM Lane V/C Ratio	0.006	-	0.007	-	-	
HCM Control Delay (s)	7.5	0	9.1	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	




HCM 6th TWSC
18: Iroquois St & Project Driveway (2)

Lance Drive Residential TIA
Cumulative Plus Project PM (95-120 Seconds)

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	6	9	113	109	2
Future Vol, veh/h	2	6	9	113	109	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	7	10	123	118	2
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	262	119	120	0	-	0
Stage 1	119	-	-	-	-	-
Stage 2	143	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	727	933	1468	-	-	-
Stage 1	906	-	-	-	-	-
Stage 2	884	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	722	933	1468	-	-	-
Mov Cap-2 Maneuver	722	-	-	-	-	-
Stage 1	900	-	-	-	-	-
Stage 2	884	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	9.2	0.6		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1468	-	869	-	-	
HCM Lane V/C Ratio	0.007	-	0.01	-	-	
HCM Control Delay (s)	7.5	0	9.2	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	




HCM 6th TWSC
19: Project Driveway (3) & Lance Dr

Lance Drive Residential TIA
Cumulative Plus Project PM (95-120 Seconds)

Intersection						
Int Delay, s/veh	1.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	178	3	43	246	3	27
Future Vol, veh/h	178	3	43	246	3	27
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	193	3	47	267	3	29
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	196	0	556	195
Stage 1	-	-	-	-	195	-
Stage 2	-	-	-	-	361	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1377	-	492	846
Stage 1	-	-	-	-	838	-
Stage 2	-	-	-	-	705	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1377	-	472	846
Mov Cap-2 Maneuver	-	-	-	-	472	-
Stage 1	-	-	-	-	838	-
Stage 2	-	-	-	-	677	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		1.1		9.8	
HCM LOS					A	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	784	-	-	1377	-	
HCM Lane V/C Ratio	0.042	-	-	0.034	-	
HCM Control Delay (s)	9.8	-	-	7.7	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0.1	-	-	0.1	-	

HCM 6th TWSC
20: Guerneville Rd & Project Driveway (4)























Lance Drive Residential TIA
Cumulative Plus Project PM (95-120 Seconds)

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	9	808	1086	20	13	5
Future Vol, veh/h	9	808	1086	20	13	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	878	1180	22	14	5
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	1202	0	-	0	1650	601
Stage 1	-	-	-	-	1191	-
Stage 2	-	-	-	-	459	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	576	-	-	-	90	443
Stage 1	-	-	-	-	251	-
Stage 2	-	-	-	-	603	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	576	-	-	-	87	443
Mov Cap-2 Maneuver	-	-	-	-	87	-
Stage 1	-	-	-	-	242	-
Stage 2	-	-	-	-	603	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.3	0		43.8		
HCM LOS				E		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	576	-	-	-	112	
HCM Lane V/C Ratio	0.017	-	-	-	0.175	
HCM Control Delay (s)	11.4	0.2	-	-	43.8	
HCM Lane LOS	B	A	-	-	E	
HCM 95th %tile Q(veh)	0.1	-	-	-	0.6	

HCM 6th Signalized Intersection Summary







1: Marlow Rd & Marlow Ct/W Steele Ln

Lance Drive Residential TIA
Cumulative Plus Project PM (120 Seconds)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	0	10	200	10	178	10	751	200	142	851	10
Future Volume (veh/h)	10	0	10	200	10	178	10	751	200	142	851	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	11	0	0	219	0	118	11	791	150	149	896	10
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	48	0	0	1605	0	872	23	913	1107	180	1242	14
Arrive On Green	0.03	0.00	0.00	0.45	0.00	0.45	0.01	0.26	0.26	0.10	0.35	0.35
Sat Flow, veh/h	1767	0	0	3534	0	1567	1767	3526	1519	1767	3570	40
Grp Volume(v), veh/h	11	0	0	219	0	118	11	791	150	149	442	464
Grp Sat Flow(s),veh/h/ln	1767	0	0	1767	0	1567	1767	1763	1519	1767	1763	1848
Q Serve(g_s), s	0.7	0.0	0.0	4.3	0.0	0.0	0.7	25.7	3.8	9.9	26.2	26.2
Cycle Q Clear(g_c), s	0.7	0.0	0.0	4.3	0.0	0.0	0.7	25.7	3.8	9.9	26.2	26.2
Prop In Lane	1.00		0.00	1.00		1.00	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	48	0	0	1605	0	872	23	913	1107	180	613	643
V/C Ratio(X)	0.23	0.00	0.00	0.14	0.00	0.14	0.49	0.87	0.14	0.83	0.72	0.72
Avail Cap(c_a), veh/h	227	0	0	1605	0	872	149	1031	1158	517	883	925
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.61	0.61	0.61	1.00	1.00	1.00
Uniform Delay (d), s/veh	57.2	0.0	0.0	19.1	0.0	12.8	58.8	42.5	5.5	52.9	34.1	34.1
Incr Delay (d2), s/veh	2.4	0.0	0.0	0.2	0.0	0.3	9.6	4.6	0.0	9.3	1.6	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	1.8	0.0	1.6	0.4	11.6	3.6	4.8	11.3	11.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.6	0.0	0.0	19.2	0.0	13.1	68.4	47.1	5.5	62.2	35.7	35.6
LnGrp LOS	E	A	A	B	A	B	E	D	A	E	D	D
Approach Vol, veh/h		11			337			952			1055	
Approach Delay, s/veh		59.6			17.1			40.8			39.4	
Approach LOS		E			B			D			D	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		59.1	6.4	46.7		7.8	17.1	36.0				
Change Period (Y+Rc), s		4.6	4.9	4.9		4.6	4.9	4.9				
Max Green Setting (Gmax), s		15.4	10.1	60.1		15.4	35.1	35.1				
Max Q Clear Time (g_c+I1), s		6.3	2.7	28.2		2.7	11.9	27.7				
Green Ext Time (p_c), s		0.8	0.0	6.4		0.0	0.4	3.4				
Intersection Summary												
HCM 6th Ctrl Delay				36.9								
HCM 6th LOS				D								
Notes												
User approved pedestrian interval to be less than phase max green.												
User approved volume balancing among the lanes for turning movement.												






















HCM 6th TWSC
2: Iroquois St/Apple Valley Ln & W Steele Ln

Lance Drive Residential TIA
Cumulative Plus Project PM (120 Seconds)

Intersection												
Int Delay, s/veh	7.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	30	340	64	65	530	50	59	10	39	30	20	30
Future Vol, veh/h	30	340	64	65	530	50	59	10	39	30	20	30
Conflicting Peds, #/hr	9	0	9	9	0	9	1	0	2	2	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	60	-	-	80	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	32	358	67	68	558	53	62	11	41	32	21	32
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	620	0	0	434	0	0	1213	1221	403	1214	1228	595
Stage 1	-	-	-	-	-	-	465	465	-	730	730	-
Stage 2	-	-	-	-	-	-	748	756	-	484	498	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	956	-	-	1120	-	-	158	179	645	158	177	502
Stage 1	-	-	-	-	-	-	576	561	-	412	426	-
Stage 2	-	-	-	-	-	-	403	415	-	562	543	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	948	-	-	1110	-	-	122	159	638	129	158	497
Mov Cap-2 Maneuver	-	-	-	-	-	-	122	159	-	129	158	-
Stage 1	-	-	-	-	-	-	552	537	-	395	397	-
Stage 2	-	-	-	-	-	-	335	386	-	497	520	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.6			0.9			55.4			37.9		
HCM LOS							F			E		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	178	948	-	-	1110	-	-	191				
HCM Lane V/C Ratio	0.639	0.033	-	-	0.062	-	-	0.441				
HCM Control Delay (s)	55.4	8.9	-	-	8.5	-	-	37.9				
HCM Lane LOS	F	A	-	-	A	-	-	E				
HCM 95th %tile Q(veh)	3.6	0.1	-	-	0.2	-	-	2.1				

HCM 6th Signalized Intersection Summary 3: Range Ave & W Steele Ln











Lance Drive Residential TIA
Cumulative Plus Project PM (120 Seconds)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	371	81	70	502	60	102	240	50	70	510	60
Future Volume (veh/h)	50	371	81	70	502	60	102	240	50	70	510	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.99	1.00		0.96	1.00		0.93
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	52	386	79	73	523	60	106	250	34	73	531	50
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	464	973	199	549	1067	122	130	436	58	196	599	56
Arrive On Green	0.65	0.65	0.65	0.65	0.65	0.65	0.07	0.14	0.14	0.11	0.19	0.19
Sat Flow, veh/h	825	1489	305	919	1633	187	1767	3107	416	1767	3233	303
Grp Volume(v), veh/h	52	0	465	73	0	583	106	140	144	73	289	292
Grp Sat Flow(s),veh/h/ln	825	0	1794	919	0	1821	1767	1763	1761	1767	1763	1773
Q Serve(g_s), s	4.1	0.0	14.5	4.8	0.0	19.6	7.1	8.9	9.2	4.6	19.1	19.3
Cycle Q Clear(g_c), s	23.7	0.0	14.5	19.4	0.0	19.6	7.1	8.9	9.2	4.6	19.1	19.3
Prop In Lane	1.00		0.17	1.00		0.10	1.00		0.24	1.00		0.17
Lane Grp Cap(c), veh/h	464	0	1173	549	0	1190	130	247	247	196	327	329
V/C Ratio(X)	0.11	0.00	0.40	0.13	0.00	0.49	0.81	0.57	0.58	0.37	0.88	0.89
Avail Cap(c_a), veh/h	464	0	1173	549	0	1190	236	560	559	196	486	489
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.48	0.48	0.48	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.6	0.0	9.7	14.3	0.0	10.6	54.8	48.2	48.3	49.5	47.6	47.7
Incr Delay (d2), s/veh	0.5	0.0	1.0	0.5	0.0	1.4	2.3	0.4	0.4	0.4	9.0	9.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	5.6	1.1	0.0	7.7	3.2	3.9	4.0	2.0	9.0	9.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.1	0.0	10.7	14.8	0.0	12.0	57.0	48.5	48.7	49.9	56.6	57.4
LnGrp LOS	B	A	B	B	A	B	E	D	D	D	E	E
Approach Vol, veh/h	517				656				390			
Approach Delay, s/veh	11.4				12.3				50.9			
Approach LOS	B				B				D			
Timer - Assigned Phs												
	2	3	4			6	7	8				
Phs Duration (G+Y+Rc), s	82.0	11.8	26.1			82.0	17.2	20.7				
Change Period (Y+Rc), s	3.6	3.0	3.9			3.6	3.9	* 3.9				
Max Green Setting (Gmax), s	60.4	16.0	33.1			60.4	11.0	* 38				
Max Q Clear Time (g_c+I1), s	25.7	9.1	21.3			21.6	6.6	11.2				
Green Ext Time (p_c), s	1.1	0.0	0.9			1.4	0.0	0.5				
Intersection Summary												
HCM 6th Ctrl Delay	31.8											
HCM 6th LOS	C											
Notes												

HCM 6th Signalized Intersection Summary 4: Marlow Rd & Guerneville Rd

Lance Drive Residential TIA
Cumulative Plus Project PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	200	506	150	330	556	141	160	720	223	81	840	90
Future Volume (veh/h)	200	506	150	330	556	141	160	720	223	81	840	90
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	211	533	78	347	585	129	168	758	147	85	884	89
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	239	662	442	349	725	159	172	891	699	236	931	94
Arrive On Green	0.14	0.19	0.19	0.20	0.25	0.25	0.10	0.25	0.25	0.09	0.19	0.19
Sat Flow, veh/h	1767	3526	1537	1767	2860	629	1767	3526	1539	1767	3228	325
Grp Volume(v), veh/h	211	533	78	347	360	354	168	758	147	85	483	490
Grp Sat Flow(s),veh/h/ln	1767	1763	1537	1767	1763	1726	1767	1763	1539	1767	1763	1790
Q Serve(g_s), s	14.1	17.4	2.1	23.5	23.0	23.1	11.4	24.6	0.0	5.4	32.5	32.5
Cycle Q Clear(g_c), s	14.1	17.4	2.1	23.5	23.0	23.1	11.4	24.6	0.0	5.4	32.5	32.5
Prop In Lane	1.00		1.00	1.00		0.36	1.00		1.00	1.00		0.18
Lane Grp Cap(c), veh/h	239	662	442	349	447	437	172	891	699	236	508	516
V/C Ratio(X)	0.88	0.80	0.18	0.99	0.81	0.81	0.98	0.85	0.21	0.36	0.95	0.95
Avail Cap(c_a), veh/h	284	831	516	349	480	470	172	1064	775	236	510	518
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67
Upstream Filter(I)	1.00	1.00	1.00	0.95	0.95	0.95	0.50	0.50	0.50	0.80	0.80	0.80
Uniform Delay (d), s/veh	51.0	46.6	10.8	48.1	42.0	42.1	54.0	42.7	20.0	49.8	47.5	47.5
Incr Delay (d2), s/veh	23.4	4.7	0.2	45.3	13.7	14.3	41.6	3.0	0.1	0.7	23.8	23.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.7	7.9	1.0	14.5	11.4	11.3	7.0	10.8	2.4	2.5	18.0	18.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	74.4	51.3	11.0	93.4	55.7	56.3	95.7	45.7	20.1	50.6	71.4	71.1
LnGrp LOS	E	D	B	F	E	E	F	D	C	D	E	E
Approach Vol, veh/h	822			1061			1073			1058		
Approach Delay, s/veh	53.4			68.3			50.0			69.6		
Approach LOS	D			E			D			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	29.4	28.2	17.0	39.9	21.5	36.1	21.3	35.6				
Change Period (Y+Rc), s	5.7	* 5.7	5.3	5.3	5.3	5.7	5.3	5.3				
Max Green Setting (Gmax), s	28.3	* 28	11.7	34.7	19.3	32.7	10.2	36.2				
Max Q Clear Time (g_c+Q), s	25.5	19.4	13.4	34.5	16.1	25.1	7.4	26.6				
Green Ext Time (p_c), s	0.0	2.4	0.0	0.1	0.2	2.5	0.0	3.7				

Intersection Summary

HCM 6th Ctrl Delay 60.7
HCM 6th LOS E

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary 5: Ridley Ave & Guerneville Rd

Lance Drive Residential TIA
Cumulative Plus Project PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	800	40	84	977	20	20	10	57	20	10	20
Future Volume (veh/h)	20	800	40	84	977	20	20	10	57	20	10	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No		No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	22	860	42	90	1051	22	22	11	10	22	11	0
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	500	3045	149	583	3142	66	80	30	20	97	39	0
Arrive On Green	0.89	0.89	0.89	0.89	0.89	0.89	0.05	0.05	0.05	0.05	0.05	0.00
Sat Flow, veh/h	521	3421	167	613	3529	74	665	569	374	908	740	0
Grp Volume(v), veh/h	22	443	459	90	525	548	43	0	0	33	0	0
Grp Sat Flow(s), veh/h/ln	521	1763	1825	613	1763	1840	1609	0	0	1648	0	0
Q Serve(g_s), s	0.8	4.4	4.4	3.0	5.6	5.6	0.8	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	6.4	4.4	4.4	7.5	5.6	5.6	2.9	0.0	0.0	2.1	0.0	0.0
Prop In Lane	1.00		0.09	1.00		0.04	0.51		0.23	0.67		0.00
Lane Grp Cap(c), veh/h	500	1569	1625	583	1569	1638	129	0	0	136	0	0
V/C Ratio(X)	0.04	0.28	0.28	0.15	0.33	0.33	0.33	0.00	0.00	0.24	0.00	0.00
Avail Cap(c_a), veh/h	500	1569	1625	583	1569	1638	468	0	0	471	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.82	0.82	0.82	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	1.5	1.0	1.0	1.5	1.0	1.0	55.2	0.0	0.0	54.9	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.4	0.4	0.0	0.0	0.0	0.6	0.0	0.0	0.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.4	0.4	0.2	0.3	0.3	1.3	0.0	0.0	1.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	1.7	1.3	1.3	1.6	1.1	1.1	55.8	0.0	0.0	55.2	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	E	A	A	E	A	A
Approach Vol, veh/h	924				1163				43		33	
Approach Delay, s/veh	1.3				1.1				55.8		55.2	
Approach LOS	A				A				E		E	
Timer - Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	110.7		9.3		110.7		9.3					
Change Period (Y+Rc), s	3.9		3.0		3.9		3.0					
Max Green Setting (Gmax), s	80.1		33.0		80.1		33.0					
Max Q Clear Time (g_c+I1), s	8.4		4.1		9.5		4.9					
Green Ext Time (p_c), s	1.9		0.1		2.6		0.1					

Intersection Summary

HCM 6th Ctrl Delay	3.1
HCM 6th LOS	A

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

6: Lance Dr & Guerneville Rd

Lance Drive Residential TIA
Cumulative Plus Project PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	118	693	20	70	1040	248	10	43	50	141	48	76
Future Volume (veh/h)	118	693	20	70	1040	248	10	43	50	141	48	76
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.99	0.99		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	123	722	20	73	1083	241	10	45	15	147	50	67
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	149	792	22	331	1160	505	61	238	72	209	58	75
Arrive On Green	0.03	0.07	0.07	0.13	0.22	0.22	0.19	0.19	0.19	0.19	0.19	0.19
Sat Flow, veh/h	1767	3501	97	1767	3526	1536	138	1224	372	834	298	385
Grp Volume(v), veh/h	123	363	379	73	1083	241	70	0	0	264	0	0
Grp Sat Flow(s), veh/h/ln	1767	1763	1836	1767	1763	1536	1735	0	0	1518	0	0
Q Serve(g_s), s	8.3	24.6	24.6	4.5	36.2	16.4	0.0	0.0	0.0	16.3	0.0	0.0
Cycle Q Clear(g_c), s	8.3	24.6	24.6	4.5	36.2	16.4	3.9	0.0	0.0	20.2	0.0	0.0
Prop In Lane	1.00		0.05	1.00		1.00	0.14		0.21	0.56		0.25
Lane Grp Cap(c), veh/h	149	399	415	331	1160	505	371	0	0	342	0	0
V/C Ratio(X)	0.82	0.91	0.91	0.22	0.93	0.48	0.19	0.00	0.00	0.77	0.00	0.00
Avail Cap(c_a), veh/h	202	848	883	331	1695	738	512	0	0	464	0	0
HCM Platoon Ratio	0.33	0.33	0.33	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.85	0.85	0.85	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	57.4	54.3	54.3	44.6	45.5	37.8	40.5	0.0	0.0	46.7	0.0	0.0
Incr Delay (d2), s/veh	13.5	3.4	3.3	0.1	13.0	2.7	0.1	0.0	0.0	3.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.4	12.0	12.5	2.0	18.3	6.8	1.8	0.0	0.0	8.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	70.9	57.7	57.6	44.7	58.5	40.5	40.6	0.0	0.0	50.3	0.0	0.0
LnGrp LOS	E	E	E	D	E	D	D	A	A	D	A	A
Approach Vol, veh/h	865			1397			70			264		
Approach Delay, s/veh	59.6			54.6			40.6			50.3		
Approach LOS	E			D			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	27.8	32.5		27.9	15.4	44.8		27.9				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		4.6				
Max Green Setting (Gmax), s	27.8	57.7		33.4	13.7	57.7		33.4				
Max Q Clear Time (g_c+10), s	10.5	26.6		22.2	10.3	38.2		5.9				
Green Ext Time (p_c), s	0.0	0.6		0.3	0.0	1.3		0.1				

Intersection Summary

HCM 6th Ctrl Delay 55.5

HCM 6th LOS E

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

7: N Dutton Ave/Westberry Dr & Guerneville Rd

Lance Drive Residential TIA
Cumulative Plus Project PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	799	145	530	1077	30	221	10	520	10	10	10
Future Volume (veh/h)	10	799	145	530	1077	30	221	10	520	10	10	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.99	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	11	859	148	570	1158	31	246	0	208	11	11	7
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	27	897	155	1378	2405	64	301	0	765	28	28	18
Arrive On Green	0.02	0.30	0.30	0.80	1.00	1.00	0.09	0.00	0.09	0.04	0.04	0.04
Sat Flow, veh/h	1767	2996	516	3428	3505	94	3534	0	1561	658	658	419
Grp Volume(v), veh/h	11	505	502	570	582	607	246	0	208	29	0	0
Grp Sat Flow(s),veh/h/ln	1767	1763	1750	1714	1763	1836	1767	0	1561	1734	0	0
Q Serve(g_s), s	0.7	33.8	33.8	5.9	0.0	0.0	8.2	0.0	0.0	2.0	0.0	0.0
Cycle Q Clear(g_c), s	0.7	33.8	33.8	5.9	0.0	0.0	8.2	0.0	0.0	2.0	0.0	0.0
Prop In Lane	1.00		0.30	1.00		0.05	1.00		1.00	0.38		0.24
Lane Grp Cap(c), veh/h	27	528	524	1378	1209	1259	301	0	765	74	0	0
V/C Ratio(X)	0.41	0.96	0.96	0.41	0.48	0.48	0.82	0.00	0.27	0.39	0.00	0.00
Avail Cap(c_a), veh/h	88	535	531	1378	1209	1259	345	0	785	400	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.92	0.92	0.92	0.44	0.44	0.44	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	58.5	41.3	41.3	7.6	0.0	0.0	54.0	0.0	18.2	55.9	0.0	0.0
Incr Delay (d2), s/veh	3.3	28.5	28.6	0.0	0.6	0.6	11.1	0.0	0.1	1.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	18.3	18.2	1.6	0.2	0.2	4.1	0.0	3.3	0.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.8	69.7	69.9	7.6	0.6	0.6	65.0	0.0	18.2	57.2	0.0	0.0
LnGrp LOS	E	E	E	A	A	A	E	A	B	E	A	A
Approach Vol, veh/h	1018			1759			454			29		
Approach Delay, s/veh	69.7			2.9			43.6			57.2		
Approach LOS	E			A			D			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	53.6	41.2		9.7	7.1	87.6		15.5				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		5.3				
Max Green Setting (Gmax), s	27.7	36.4		27.7	6.0	54.1		11.7				
Max Q Clear Time (g_c+11), s	35.8			4.0	2.7	2.0		10.2				
Green Ext Time (p_c), s	0.1	0.1		0.0	0.0	1.0		0.0				

Intersection Summary

HCM 6th Ctrl Delay 29.9

HCM 6th LOS C

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 8: Herbert St/Coffey Ln & Guerneville Rd

Lance Drive Residential TIA
Cumulative Plus Project PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	201	1048	70	60	1357	110	50	30	40	120	30	270
Future Volume (veh/h)	201	1048	70	60	1357	110	50	30	40	120	30	270
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.99	1.00		0.94	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	218	1139	72	65	1475	116	54	33	26	130	33	94
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	158	1161	73	445	1682	132	87	53	42	183	47	332
Arrive On Green	0.18	0.69	0.69	0.25	0.51	0.51	0.11	0.11	0.11	0.13	0.13	0.13
Sat Flow, veh/h	1767	3358	212	1767	3310	259	819	500	394	1423	361	1491
Grp Volume(v), veh/h	218	597	614	65	782	809	113	0	0	163	0	94
Grp Sat Flow(s), veh/h/ln	1767	1763	1807	1767	1763	1806	1714	0	0	1784	0	1491
Q Serve(g_s), s	10.7	39.0	39.2	3.4	47.0	47.9	7.6	0.0	0.0	10.5	0.0	6.3
Cycle Q Clear(g_c), s	10.7	39.0	39.2	3.4	47.0	47.9	7.6	0.0	0.0	10.5	0.0	6.3
Prop In Lane	1.00		0.12	1.00		0.14	0.48		0.23	0.80		1.00
Lane Grp Cap(c), veh/h	158	609	625	445	896	918	182	0	0	230	0	332
V/C Ratio(X)	1.38	0.98	0.98	0.15	0.87	0.88	0.62	0.00	0.00	0.71	0.00	0.28
Avail Cap(c_a), veh/h	158	623	639	445	896	918	357	0	0	387	0	463
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.74	0.74	0.74	0.57	0.57	0.57	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	49.3	18.1	18.2	34.9	26.1	26.3	51.3	0.0	0.0	50.1	0.0	39.2
Incr Delay (d2), s/veh	199.0	27.0	27.0	0.0	7.0	7.3	1.3	0.0	0.0	1.5	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	11.3	11.6	1.5	20.1	21.0	3.3	0.0	0.0	4.7	0.0	2.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	248.3	45.2	45.1	34.9	33.0	33.6	52.6	0.0	0.0	51.6	0.0	39.3
LnGrp LOS	F	D	D	C	C	C	D	A	A	D	A	D
Approach Vol, veh/h	1429			1656			113			257		
Approach Delay, s/veh	76.1			33.4			52.6			47.1		
Approach LOS	E			C			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	35.5	46.8		20.4	16.0	66.3		17.3				
Change Period (Y+Rc), s	5.3	5.3		4.9	5.3	5.3		4.6				
Max Green Setting (Gmax), s	6.5	42.4		26.0	10.7	38.2		25.0				
Max Q Clear Time (g_c+1/4), s	15.4	41.2		12.5	12.7	49.9		9.6				
Green Ext Time (p_c), s	0.0	0.3		0.1	0.0	0.0		0.1				
Intersection Summary												
HCM 6th Ctrl Delay	52.7											
HCM 6th LOS	D											

HCM 6th Signalized Intersection Summary

9: Range Ave & Guerneville Rd

Lance Drive Residential TIA
Cumulative Plus Project PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	180	756	242	100	954	22	333	190	170	101	270	290
Future Volume (veh/h)	180	756	242	100	954	22	333	190	170	101	270	290
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	188	788	0	104	994	0	216	382	102	105	281	130
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	403	1551		128	1002		314	500	132	246	324	145
Arrive On Green	0.46	0.88	0.00	0.07	0.28	0.00	0.18	0.18	0.18	0.05	0.05	0.05
Sat Flow, veh/h	1767	3618	0	1767	3618	0	1767	2815	741	1767	2331	1042
Grp Volume(v), veh/h	188	788	0	104	994	0	216	250	234	105	210	201
Grp Sat Flow(s),veh/h/ln	1767	1763	0	1767	1763	0	1767	1856	1701	1767	1763	1610
Q Serve(g_s), s	8.8	5.8	0.0	7.0	33.7	0.0	13.7	15.4	15.7	6.9	14.2	14.9
Cycle Q Clear(g_c), s	8.8	5.8	0.0	7.0	33.7	0.0	13.7	15.4	15.7	6.9	14.2	14.9
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.44	1.00		0.65
Lane Grp Cap(c), veh/h	403	1551		128	1002		314	330	302	246	245	224
V/C Ratio(X)	0.47	0.51		0.81	0.99		0.69	0.76	0.77	0.43	0.86	0.90
Avail Cap(c_a), veh/h	403	1551		143	1002		486	510	468	246	245	224
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	0.71	0.71	0.00	0.87	0.87	0.00	1.00	1.00	1.00	0.54	0.54	0.54
Uniform Delay (d), s/veh	27.6	4.4	0.0	54.9	42.8	0.0	46.2	46.9	47.1	52.6	56.1	56.4
Incr Delay (d2), s/veh	0.2	0.8	0.0	21.3	24.5	0.0	1.0	1.4	1.6	0.2	14.3	20.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	1.5	0.0	3.8	17.8	0.0	6.1	7.2	6.8	3.2	7.7	7.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.8	5.2	0.0	76.1	67.3	0.0	47.2	48.3	48.7	52.8	70.3	77.3
LnGrp LOS	C	A		E	E		D	D	D	D	E	E
Approach Vol, veh/h	976		A	1098		A	700			516		
Approach Delay, s/veh	9.6			68.2			48.1			69.5		
Approach LOS	A			E			D			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.0	58.1		22.0	32.7	39.4		25.9				
Change Period (Y+Rc), s	5.3	5.3		5.3	5.3	5.3		4.6				
Max Green Setting (Gmax), s	40.1	40.1		16.7	15.7	34.1		33.0				
Max Q Clear Time (g_c+1.9, s)	7.8	7.8		16.9	10.8	35.7		17.7				
Green Ext Time (p_c), s	0.0	0.9		0.0	0.0	0.0		0.4				

Intersection Summary

HCM 6th Ctrl Delay 46.7
HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

10: Guerneville Rd & Steele Wy

Lance Drive Residential TIA
Cumulative Plus Project PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	885	122	160	963	12	83	50	190	381	60	30
Future Volume (veh/h)	20	885	122	160	963	12	83	50	190	381	60	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	20	903	97	163	983	12	68	75	102	433	0	19
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	543	1888	977	218	1041	13	166	174	244	517	0	707
Arrive On Green	0.31	0.54	0.54	0.06	0.29	0.29	0.09	0.09	0.09	0.15	0.00	0.15
Sat Flow, veh/h	1767	3526	1550	3428	3567	44	1767	1856	1537	3534	0	1529
Grp Volume(v), veh/h	20	903	97	163	486	509	68	75	102	433	0	19
Grp Sat Flow(s), veh/h/ln	1767	1763	1550	1714	1763	1847	1767	1856	1537	1767	0	1529
Q Serve(g_s), s	1.0	19.2	3.0	5.6	32.3	32.3	4.4	4.6	7.2	14.3	0.0	0.0
Cycle Q Clear(g_c), s	1.0	19.2	3.0	5.6	32.3	32.3	4.4	4.6	7.2	14.3	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.02	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	543	1888	977	218	514	539	166	174	244	517	0	707
V/C Ratio(X)	0.04	0.48	0.10	0.75	0.94	0.94	0.41	0.43	0.42	0.84	0.00	0.03
Avail Cap(c_a), veh/h	543	1888	977	271	580	608	398	417	446	798	0	829
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.69	0.69	0.69	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	29.1	17.4	8.8	55.3	41.5	41.5	51.3	51.4	45.7	49.8	0.0	18.1
Incr Delay (d2), s/veh	0.0	0.6	0.1	6.2	22.1	21.4	0.6	0.6	0.4	2.7	0.0	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	0.4	7.7	1.3	2.6	16.9	17.6	2.0	2.2	2.8	6.5	0.0	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	29.1	18.0	8.9	61.5	63.7	63.0	51.9	52.0	46.1	52.5	0.0	18.1
LnGrp LOS	C	B	A	E	E	E	D	D	D	D	A	B
Approach Vol, veh/h	1020			1158			245			452		
Approach Delay, s/veh	17.3			63.0			49.5			51.1		
Approach LOS	B			E			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	2.5	69.2		22.5	41.8	39.9		15.8				
Change Period (Y+Rc), s	4.9	4.9		4.9	4.9	4.9		4.6				
Max Green Setting (Gmax), s	2.5	37.1		27.1	7.1	39.5		27.0				
Max Q Clear Time (g_c+11), s	2.5	21.2		16.3	3.0	34.3		9.2				
Green Ext Time (p_c), s	0.0	1.2		0.1	0.0	0.7		0.1				

Intersection Summary

HCM 6th Ctrl Delay 43.8

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

11: Cleveland Ave & Guerneville Rd

Lance Drive Residential TIA
Cumulative Plus Project PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	RT	LT	RT	RT	LT	RT	RT	LT	RT	RT	LT	RT
Traffic Volume (veh/h)	140	1246	90	370	1465	240	110	160	280	490	410	140
Future Volume (veh/h)	140	1246	90	370	1465	240	110	160	280	490	410	140
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.98	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	146	1298	86	385	1526	184	115	167	98	355	644	127
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	199	1565	104	437	1384	604	272	334	184	410	696	137
Arrive On Green	0.06	0.32	0.32	0.13	0.39	0.39	0.15	0.15	0.15	0.23	0.23	0.23
Sat Flow, veh/h	3428	4844	321	3428	3526	1540	1767	2169	1199	1767	2995	590
Grp Volume(v), veh/h	146	905	479	385	1526	184	115	134	131	355	399	372
Grp Sat Flow(s), veh/h/ln	1714	1689	1788	1714	1763	1540	1767	1763	1606	1767	1856	1729
Q Serve(g_s), s	5.0	29.7	29.7	13.2	47.1	9.9	7.1	8.3	9.0	23.2	25.2	25.3
Cycle Q Clear(g_c), s	5.0	29.7	29.7	13.2	47.1	9.9	7.1	8.3	9.0	23.2	25.2	25.3
Prop In Lane	1.00		0.18	1.00		1.00	1.00		0.75	1.00		0.34
Lane Grp Cap(c), veh/h	199	1091	578	437	1384	604	272	271	247	410	431	402
V/C Ratio(X)	0.73	0.83	0.83	0.88	1.10	0.30	0.42	0.49	0.53	0.86	0.92	0.93
Avail Cap(c_a), veh/h	203	1091	578	717	1384	604	272	271	247	546	574	535
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.42	0.42	0.42	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	55.6	37.6	37.6	51.5	36.5	25.1	46.0	46.5	46.8	44.3	45.0	45.1
Incr Delay (d2), s/veh	11.0	5.1	9.3	1.8	51.5	0.0	4.8	6.3	8.0	8.7	15.4	16.7
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	12.8	14.2	5.7	29.4	3.6	3.5	4.1	4.2	11.0	13.3	12.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	66.6	42.7	46.8	53.3	88.0	25.2	50.7	52.8	54.8	53.0	60.5	61.8
LnGrp LOS	E	D	D	D	F	C	D	D	D	D	E	E
Approach Vol, veh/h	1530			2095			380			1126		
Approach Delay, s/veh	46.3			76.1			52.8			58.6		
Approach LOS	D			E			D			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	30.2	43.7		23.4	11.9	52.0		32.8				
Change Period (Y+Rc), s	4.9	4.9		4.9	4.9	4.9		4.9				
Max Green Setting (Gmax), s	25.5	29.1		9.1	7.1	47.1		37.1				
Max Q Clear Time (g_c+I1), s	11.5	31.7		11.0	7.0	49.1		27.3				
Green Ext Time (p_c), s	0.1	0.0		0.0	0.0	0.0		0.6				

Intersection Summary

HCM 6th Ctrl Delay 61.6

HCM 6th LOS E

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 12: US 101 SB Ramps & Guerneville Rd

Lance Drive Residential TIA
Cumulative Plus Project PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑					↑	↑	↑
Traffic Volume (veh/h)	0	1379	667	350	1662	0	0	0	0	350	80	423
Future Volume (veh/h)	0	1379	667	350	1662	0	0	0	0	350	80	423
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1856	1856	1856	1856	0				1856	1856	1856
Adj Flow Rate, veh/h	0	1422	297	361	1713	0				420	0	402
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	1746	525	413	1784	0				1466	0	652
Arrive On Green	0.00	0.34	0.34	0.12	0.51	0.00				0.41	0.00	0.41
Sat Flow, veh/h	0	5233	1522	3428	3618	0				3534	0	1572
Grp Volume(v), veh/h	0	1422	297	361	1713	0				420	0	402
Grp Sat Flow(s),veh/h/ln	0	1689	1522	1714	1763	0				1767	0	1572
Q Serve(g_s), s	0.0	30.7	19.1	12.4	56.0	0.0				9.5	0.0	24.1
Cycle Q Clear(g_c), s	0.0	30.7	19.1	12.4	56.0	0.0				9.5	0.0	24.1
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1746	525	413	1784	0				1466	0	652
V/C Ratio(X)	0.00	0.81	0.57	0.87	0.96	0.00				0.29	0.00	0.62
Avail Cap(c_a), veh/h	0	1988	597	546	2089	0				1466	0	652
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.34	0.34	0.51	0.51	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	35.8	32.0	51.9	28.5	0.0				23.3	0.0	27.6
Incr Delay (d2), s/veh	0.0	0.7	0.1	5.3	6.2	0.0				0.5	0.0	4.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	12.5	6.9	5.6	23.8	0.0				3.9	0.0	9.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	36.5	32.1	57.2	34.6	0.0				23.8	0.0	31.9
LnGrp LOS	A	D	C	E	C	A				C	A	C
Approach Vol, veh/h		1719			2074						822	
Approach Delay, s/veh		35.8			38.6						27.8	
Approach LOS		D			D						C	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	9.4	46.3		54.4		65.6						
Change Period (Y+Rc), s	4.9	4.9		4.6		4.9						
Max Green Setting (Gmax), s	9.4	47.1		39.4		71.1						
Max Q Clear Time (g_c+I1), s	4.4	32.7		26.1		58.0						
Green Ext Time (p_c), s	0.0	2.1		0.1		2.7						

Intersection Summary

HCM 6th Ctrl Delay 35.6
HCM 6th LOS D

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 13: US 101 NB Ramps & Guerneville Rd/Steele Ln

Lance Drive Residential TIA
Cumulative Plus Project PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↑↑			↑↑↑		↰	↰↱	↱			
Traffic Volume (veh/h)	501	1228	0	0	1193	280	819	10	400	0	0	0
Future Volume (veh/h)	501	1228	0	0	1193	280	819	10	400	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1856	1856	0	0	1856	1856	1856	1856	1856			
Adj Flow Rate, veh/h	522	1279	0	0	1243	265	966	0	236			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	3	3	0	0	3	3	3	3	3			
Cap, veh/h	944	2237	0	0	1325	282	1012	0	450			
Arrive On Green	0.55	1.00	0.00	0.00	0.32	0.32	0.29	0.00	0.29			
Sat Flow, veh/h	3428	3618	0	0	4330	887	3534	0	1572			
Grp Volume(v), veh/h	522	1279	0	0	1008	500	966	0	236			
Grp Sat Flow(s),veh/h/ln	1714	1763	0	0	1689	1673	1767	0	1572			
Q Serve(g_s), s	11.8	0.0	0.0	0.0	34.8	34.8	32.2	0.0	15.1			
Cycle Q Clear(g_c), s	11.8	0.0	0.0	0.0	34.8	34.8	32.2	0.0	15.1			
Prop In Lane	1.00		0.00	0.00		0.53	1.00		1.00			
Lane Grp Cap(c), veh/h	944	2237	0	0	1075	533	1012	0	450			
V/C Ratio(X)	0.55	0.57	0.00	0.00	0.94	0.94	0.95	0.00	0.52			
Avail Cap(c_a), veh/h	944	2237	0	0	1174	581	1249	0	556			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.68	0.68	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	22.2	0.0	0.0	0.0	39.8	39.8	42.1	0.0	36.0			
Incr Delay (d2), s/veh	0.3	0.7	0.0	0.0	12.9	21.5	13.2	0.0	0.4			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	3.8	0.2	0.0	0.0	16.0	17.2	15.3	0.0	5.7			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.5	0.7	0.0	0.0	52.6	61.2	55.3	0.0	36.3			
LnGrp LOS	C	A	A	A	D	E	E	A	D			
Approach Vol, veh/h	1801			1508			1202					
Approach Delay, s/veh	7.0			55.5			51.6					
Approach LOS	A			E			D					
Timer - Assigned Phs	2			5			6			8		
Phs Duration (G+Y+Rc), s	81.0			37.9			43.1			39.0		
Change Period (Y+Rc), s	4.9			4.9			4.9			4.6		
Max Green Setting (Gmax), s	68.1			21.5			41.7			42.4		
Max Q Clear Time (g_c+I1), s	2.0			13.8			36.8			34.2		
Green Ext Time (p_c), s	1.9			0.1			1.4			0.1		

Intersection Summary

HCM 6th Ctrl Delay 35.1
HCM 6th LOS D










Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 14: Stony Point Rd/Marlow Rd & W College Ave

Lance Drive Residential TIA
Cumulative Plus Project PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	93	290	130	264	400	230	190	910	306	190	982	128
Future Volume (veh/h)	93	290	130	264	400	230	190	910	306	190	982	128
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	98	305	97	278	421	176	200	958	199	200	1034	126
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	275	369	115	344	434	179	229	1105	791	309	1133	138
Arrive On Green	0.16	0.14	0.14	0.19	0.18	0.18	0.13	0.31	0.31	0.17	0.36	0.36
Sat Flow, veh/h	1767	2632	820	1767	2419	999	1767	3526	1546	1767	3157	384
Grp Volume(v), veh/h	98	202	200	278	305	292	200	958	199	200	577	583
Grp Sat Flow(s),veh/h/ln	1767	1763	1689	1767	1763	1656	1767	1763	1546	1767	1763	1779
Q Serve(g_s), s	5.9	13.4	13.8	18.0	20.6	21.0	13.3	30.7	3.3	12.6	37.4	37.5
Cycle Q Clear(g_c), s	5.9	13.4	13.8	18.0	20.6	21.0	13.3	30.7	3.3	12.6	37.4	37.5
Prop In Lane	1.00		0.49	1.00		0.60	1.00		1.00	1.00		0.22
Lane Grp Cap(c), veh/h	275	247	237	344	316	297	229	1105	791	309	632	638
V/C Ratio(X)	0.36	0.82	0.84	0.81	0.97	0.98	0.87	0.87	0.25	0.65	0.91	0.91
Avail Cap(c_a), veh/h	275	289	277	344	316	297	305	1254	856	349	671	678
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.27	0.27	0.27	1.00	1.00	1.00	0.33	0.33	0.33
Uniform Delay (d), s/veh	45.3	50.1	50.3	46.2	48.9	49.1	51.3	38.8	5.6	46.1	36.7	36.7
Incr Delay (d2), s/veh	0.8	14.6	18.3	4.0	18.7	22.8	18.8	6.1	0.2	1.2	6.5	6.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	6.8	6.9	8.1	10.5	10.4	7.0	13.8	1.3	5.6	16.6	16.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.1	64.7	68.5	50.2	67.6	71.9	70.0	44.9	5.8	47.2	43.2	43.3
LnGrp LOS	D	E	E	D	E	E	E	D	A	D	D	D
Approach Vol, veh/h	500				875				1357		1360	
Approach Delay, s/veh	62.6				63.5				42.9		43.8	
Approach LOS	E				E				D		D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	28.7	22.1	20.9	48.3	24.0	26.8	26.3	42.9				
Change Period (Y+Rc), s	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3				
Max Green Setting (Gmax), s	22.3	19.7	20.7	45.7	12.7	19.7	23.7	42.7				
Max Q Clear Time (g_c+20.0), s	20.0	15.8	15.3	39.5	7.9	23.0	14.6	32.7				
Green Ext Time (p_c), s	0.0	0.8	0.2	3.5	0.1	0.0	0.3	4.9				

Intersection Summary

HCM 6th Ctrl Delay 50.0
HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary 15: N Dutton Ave & W College Ave

Lance Drive Residential TIA
Cumulative Plus Project PM (120 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	670	120	220	900	213	170	406	150	365	596	160
Future Volume (veh/h)	100	670	120	220	900	213	170	406	150	365	596	160
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	104	698	113	229	938	207	177	423	121	380	621	141
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	128	751	122	286	988	218	289	483	137	510	865	196
Arrive On Green	0.07	0.25	0.25	0.16	0.35	0.35	0.16	0.18	0.18	0.29	0.30	0.30
Sat Flow, veh/h	1767	3030	490	1767	2862	631	1767	2699	764	1767	2844	644
Grp Volume(v), veh/h	104	406	405	229	577	568	177	275	269	380	384	378
Grp Sat Flow(s),veh/h/ln	1767	1763	1758	1767	1763	1730	1767	1763	1700	1767	1763	1726
Q Serve(g_s), s	7.0	27.0	27.0	15.0	38.3	38.4	11.2	18.2	18.5	23.4	23.3	23.4
Cycle Q Clear(g_c), s	7.0	27.0	27.0	15.0	38.3	38.4	11.2	18.2	18.5	23.4	23.3	23.4
Prop In Lane	1.00		0.28	1.00		0.36	1.00		0.45	1.00		0.37
Lane Grp Cap(c), veh/h	128	437	436	286	608	597	289	316	304	510	536	525
V/C Ratio(X)	0.81	0.93	0.93	0.80	0.95	0.95	0.61	0.87	0.88	0.75	0.72	0.72
Avail Cap(c_a), veh/h	133	472	470	297	636	624	289	439	424	510	660	646
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.74	0.74	0.74	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.9	44.1	44.1	48.4	38.3	38.3	46.7	47.9	48.0	38.7	37.2	37.2
Incr Delay (d2), s/veh	21.8	18.6	18.9	12.7	22.8	23.5	2.8	10.1	12.1	5.3	1.9	2.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.8	13.8	13.8	7.5	19.9	19.7	5.1	8.8	8.8	10.6	10.1	9.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	76.6	62.7	63.0	61.1	61.1	61.8	49.5	58.0	60.2	44.0	39.1	39.2
LnGrp LOS	E	E	E	E	E	E	D	E	E	D	D	D
Approach Vol, veh/h	915				1374				721			
Approach Delay, s/veh	64.4				61.4				56.7			
Approach LOS	E				E				E			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	33.3	33.7	22.6	40.4	11.7	45.3	37.6	25.4				
Change Period (Y+Rc), s	3.9	* 3.9	3.0	3.9	3.0	3.9	3.0	3.9				
Max Green Setting (Gmax), s	30.8	* 32	9.0	44.9	9.0	43.3	24.0	29.9				
Max Q Clear Time (g_c+I1), s	29.0	29.0	13.2	25.4	9.0	40.4	25.4	20.5				
Green Ext Time (p_c), s	0.0	0.7	0.0	1.4	0.0	1.0	0.0	0.9				

Intersection Summary

HCM 6th Ctrl Delay 55.6





HCM 6th LOS E

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Intersection Delay, s/veh	9
Intersection LOS	A




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	50	0	62	78	109	0	6	36	95	7	13
Future Vol, veh/h	7	50	0	62	78	109	0	6	36	95	7	13
Peak Hour Factor	0.86	0.86	0.92	0.92	0.86	0.86	0.92	0.92	0.92	0.86	0.92	0.86
Heavy Vehicles, %	3	3	2	2	3	3	2	2	2	3	2	3
Mvmt Flow	8	58	0	67	91	127	0	7	39	110	8	15
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.2	9.4	7.7	9
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	12%	25%	83%
Vol Thru, %	14%	88%	31%	6%
Vol Right, %	86%	0%	44%	11%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	42	57	249	115
LT Vol	0	7	62	95
Through Vol	6	50	78	7
RT Vol	36	0	109	13
Lane Flow Rate	46	66	285	133
Geometry Grp	1	1	1	1
Degree of Util (X)	0.055	0.087	0.335	0.181
Departure Headway (Hd)	4.373	4.716	4.235	4.881
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	817	759	849	735
Service Time	2.411	2.748	2.258	2.914
HCM Lane V/C Ratio	0.056	0.087	0.336	0.181
HCM Control Delay	7.7	8.2	9.4	9
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.2	0.3	1.5	0.7




HCM 6th TWSC
17: Iroquois St & Project Driveway (1)

Lance Drive Residential TIA
Cumulative Plus Project PM (120 Seconds)

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	5	8	107	106	3
Future Vol, veh/h	1	5	8	107	106	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	5	9	116	115	3
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	251	117	118	0	-	0
Stage 1	117	-	-	-	-	-
Stage 2	134	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	738	935	1470	-	-	-
Stage 1	908	-	-	-	-	-
Stage 2	892	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	733	935	1470	-	-	-
Mov Cap-2 Maneuver	733	-	-	-	-	-
Stage 1	902	-	-	-	-	-
Stage 2	892	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	9.1	0.5		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1470	-	894	-	-	
HCM Lane V/C Ratio	0.006	-	0.007	-	-	
HCM Control Delay (s)	7.5	0	9.1	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	




HCM 6th TWSC
18: Iroquois St & Project Driveway (2)

Lance Drive Residential TIA
Cumulative Plus Project PM (120 Seconds)

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	6	9	113	109	2
Future Vol, veh/h	2	6	9	113	109	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	7	10	123	118	2
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	262	119	120	0	-	0
Stage 1	119	-	-	-	-	-
Stage 2	143	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	727	933	1468	-	-	-
Stage 1	906	-	-	-	-	-
Stage 2	884	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	722	933	1468	-	-	-
Mov Cap-2 Maneuver	722	-	-	-	-	-
Stage 1	900	-	-	-	-	-
Stage 2	884	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	9.2	0.6		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1468	-	869	-	-	
HCM Lane V/C Ratio	0.007	-	0.01	-	-	
HCM Control Delay (s)	7.5	0	9.2	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	




HCM 6th TWSC
19: Project Driveway (3) & Lance Dr

Lance Drive Residential TIA
Cumulative Plus Project PM (120 Seconds)

Intersection						
Int Delay, s/veh	1.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	178	3	43	246	3	27
Future Vol, veh/h	178	3	43	246	3	27
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	193	3	47	267	3	29
Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	196	0	556	195
Stage 1	-	-	-	-	195	-
Stage 2	-	-	-	-	361	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1377	-	492	846
Stage 1	-	-	-	-	838	-
Stage 2	-	-	-	-	705	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1377	-	472	846
Mov Cap-2 Maneuver	-	-	-	-	472	-
Stage 1	-	-	-	-	838	-
Stage 2	-	-	-	-	677	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		1.1		9.8	
HCM LOS	A					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	784	-	-	1377	-	
HCM Lane V/C Ratio	0.042	-	-	0.034	-	
HCM Control Delay (s)	9.8	-	-	7.7	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0.1	-	-	0.1	-	

HCM 6th TWSC
20: Guerneville Rd & Project Driveway (4)























Lance Drive Residential TIA
Cumulative Plus Project PM (120 Seconds)

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	9	808	1086	20	13	5
Future Vol, veh/h	9	808	1086	20	13	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	878	1180	22	14	5
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	1202	0	-	0	1650	601
Stage 1	-	-	-	-	1191	-
Stage 2	-	-	-	-	459	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	576	-	-	-	90	443
Stage 1	-	-	-	-	251	-
Stage 2	-	-	-	-	603	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	576	-	-	-	87	443
Mov Cap-2 Maneuver	-	-	-	-	87	-
Stage 1	-	-	-	-	242	-
Stage 2	-	-	-	-	603	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.3	0		43.8		
HCM LOS				E		
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	576	-	-	-	112	
HCM Lane V/C Ratio	0.017	-	-	-	0.175	
HCM Control Delay (s)	11.4	0.2	-	-	43.8	
HCM Lane LOS	B	A	-	-	E	
HCM 95th %tile Q(veh)	0.1	-	-	-	0.6	

HCM 6th Signalized Intersection Summary







1: Marlow Rd & Marlow Ct/W Steele Ln

Lance Drive Residential TIA
Cumulative Plus Project PM (120-140 Seconds)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	0	10	200	10	178	10	751	200	142	851	10
Future Volume (veh/h)	10	0	10	200	10	178	10	751	200	142	851	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	11	0	0	219	0	118	11	791	150	149	896	10
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	64	0	0	1680	0	899	22	899	1135	173	1216	14
Arrive On Green	0.04	0.00	0.00	0.48	0.00	0.48	0.01	0.26	0.26	0.10	0.34	0.34
Sat Flow, veh/h	1767	0	0	3534	0	1568	1767	3526	1519	1767	3570	40
Grp Volume(v), veh/h	11	0	0	219	0	118	11	791	150	149	442	464
Grp Sat Flow(s),veh/h/ln	1767	0	0	1767	0	1568	1767	1763	1519	1767	1763	1848
Q Serve(g_s), s	0.8	0.0	0.0	4.9	0.0	0.0	0.9	30.2	4.1	11.6	30.9	30.9
Cycle Q Clear(g_c), s	0.8	0.0	0.0	4.9	0.0	0.0	0.9	30.2	4.1	11.6	30.9	30.9
Prop In Lane	1.00		0.00	1.00		1.00	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	64	0	0	1680	0	899	22	899	1135	173	600	629
V/C Ratio(X)	0.17	0.00	0.00	0.13	0.00	0.13	0.50	0.88	0.13	0.86	0.74	0.74
Avail Cap(c_a), veh/h	379	0	0	1680	0	899	64	1010	1182	228	669	701
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	1.00	0.62	0.62	0.62	1.00	1.00	1.00
Uniform Delay (d), s/veh	65.5	0.0	0.0	20.5	0.0	13.8	68.7	50.1	5.7	62.2	40.6	40.6
Incr Delay (d2), s/veh	1.3	0.0	0.0	0.2	0.0	0.3	10.5	5.5	0.0	21.6	3.8	3.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	2.1	0.0	1.8	0.5	13.9	4.3	6.2	14.0	14.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	66.7	0.0	0.0	20.7	0.0	14.1	79.2	55.5	5.7	83.8	44.4	44.3
LnGrp LOS	E	A	A	C	A	B	E	E	A	F	D	D
Approach Vol, veh/h		11			337			952			1055	
Approach Delay, s/veh		66.7			18.4			48.0			49.9	
Approach LOS		E			B			D			D	
Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		71.1	6.6	52.6		9.6	18.6	40.6				
Change Period (Y+Rc), s		4.6	4.9	4.9		4.6	4.9	4.9				
Max Green Setting (Gmax), s		32.8	5.1	53.1		30.0	18.1	40.1				
Max Q Clear Time (g_c+I1), s		6.9	2.9	32.9		2.8	13.6	32.2				
Green Ext Time (p_c), s		1.2	0.0	5.6		0.0	0.1	3.5				
Intersection Summary												
HCM 6th Ctrl Delay				44.7								
HCM 6th LOS				D								
Notes												
User approved pedestrian interval to be less than phase max green.												
User approved volume balancing among the lanes for turning movement.												






















HCM 6th TWSC
2: Iroquois St/Apple Valley Ln & W Steele Ln

Lance Drive Residential TIA
Cumulative Plus Project PM (120-140 Seconds)

Intersection												
Int Delay, s/veh	7.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	30	340	64	65	530	50	59	10	39	30	20	30
Future Vol, veh/h	30	340	64	65	530	50	59	10	39	30	20	30
Conflicting Peds, #/hr	9	0	9	9	0	9	1	0	2	2	0	1
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	60	-	-	80	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	32	358	67	68	558	53	62	11	41	32	21	32
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	620	0	0	434	0	0	1213	1221	403	1214	1228	595
Stage 1	-	-	-	-	-	-	465	465	-	730	730	-
Stage 2	-	-	-	-	-	-	748	756	-	484	498	-
Critical Hdwy	4.13	-	-	4.13	-	-	7.13	6.53	6.23	7.13	6.53	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.13	5.53	-
Follow-up Hdwy	2.227	-	-	2.227	-	-	3.527	4.027	3.327	3.527	4.027	3.327
Pot Cap-1 Maneuver	956	-	-	1120	-	-	158	179	645	158	177	502
Stage 1	-	-	-	-	-	-	576	561	-	412	426	-
Stage 2	-	-	-	-	-	-	403	415	-	562	543	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	948	-	-	1110	-	-	122	159	638	129	158	497
Mov Cap-2 Maneuver	-	-	-	-	-	-	122	159	-	129	158	-
Stage 1	-	-	-	-	-	-	552	537	-	395	397	-
Stage 2	-	-	-	-	-	-	335	386	-	497	520	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.6			0.9			55.4			37.9		
HCM LOS							F			E		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	178	948	-	-	1110	-	-	191				
HCM Lane V/C Ratio	0.639	0.033	-	-	0.062	-	-	0.441				
HCM Control Delay (s)	55.4	8.9	-	-	8.5	-	-	37.9				
HCM Lane LOS	F	A	-	-	A	-	-	E				
HCM 95th %tile Q(veh)	3.6	0.1	-	-	0.2	-	-	2.1				

HCM 6th Signalized Intersection Summary 3: Range Ave & W Steele Ln

Lance Drive Residential TIA
Cumulative Plus Project PM (120-140 Seconds)

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	371	81	70	502	60	102	240	50	70	510	60
Future Volume (veh/h)	50	371	81	70	502	60	102	240	50	70	510	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		1.00	1.00		0.96	1.00		0.93
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	52	386	5	73	523	43	106	250	10	73	531	55
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	487	1221	16	621	1130	93	128	434	17	220	590	61
Arrive On Green	0.67	0.67	0.67	0.67	0.67	0.67	0.07	0.13	0.13	0.12	0.18	0.18
Sat Flow, veh/h	838	1827	24	984	1691	139	1767	3449	137	1767	3199	330
Grp Volume(v), veh/h	52	0	391	73	0	566	106	127	133	73	292	294
Grp Sat Flow(s),veh/h/ln	838	0	1851	984	0	1830	1767	1763	1824	1767	1763	1766
Q Serve(g_s), s	4.4	0.0	12.4	4.7	0.0	20.8	8.3	9.5	9.6	5.3	22.6	22.8
Cycle Q Clear(g_c), s	25.3	0.0	12.4	17.2	0.0	20.8	8.3	9.5	9.6	5.3	22.6	22.8
Prop In Lane	1.00		0.01	1.00		0.08	1.00		0.08	1.00		0.19
Lane Grp Cap(c), veh/h	487	0	1237	621	0	1223	128	222	230	220	325	326
V/C Ratio(X)	0.11	0.00	0.32	0.12	0.00	0.46	0.83	0.57	0.58	0.33	0.90	0.90
Avail Cap(c_a), veh/h	487	0	1237	621	0	1223	215	517	535	220	480	481
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.45	0.45	0.45	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.2	0.0	9.8	13.4	0.0	11.2	64.1	57.6	57.7	56.0	55.8	55.9
Incr Delay (d2), s/veh	0.4	0.0	0.7	0.4	0.0	1.3	2.4	0.4	0.4	0.3	10.9	11.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	5.1	1.1	0.0	8.5	3.8	4.2	4.4	2.4	10.9	11.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.7	0.0	10.4	13.8	0.0	12.4	66.4	58.0	58.1	56.3	66.7	67.7
LnGrp LOS	B	A	B	B	A	B	E	E	E	E	E	E
Approach Vol, veh/h	443			639			366			659		
Approach Delay, s/veh	11.3			12.6			60.5			66.0		
Approach LOS	B			B			E			E		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	97.2			13.1			29.7			97.2		
Change Period (Y+Rc), s	3.6			3.0			3.9			3.6		
Max Green Setting (Gmax), s	74.4			17.0			38.1			74.4		
Max Q Clear Time (g_c+I1), s	27.3			10.3			24.8			22.8		
Green Ext Time (p_c), s	0.9			0.0			1.0			1.3		

Intersection Summary

HCM 6th Ctrl Delay	37.3
HCM 6th LOS	D

Notes











* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary

4: Marlow Rd & Guerneville Rd

Lance Drive Residential TIA
Cumulative Plus Project PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	200	506	150	330	556	141	160	720	223	81	840	90
Future Volume (veh/h)	200	506	150	330	556	141	160	720	223	81	840	90
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	211	533	101	347	585	128	168	758	155	85	884	89
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	239	660	454	349	724	158	187	893	700	248	929	93
Arrive On Green	0.14	0.19	0.19	0.20	0.25	0.25	0.11	0.25	0.25	0.14	0.29	0.29
Sat Flow, veh/h	1767	3526	1537	1767	2865	625	1767	3526	1539	1767	3228	325
Grp Volume(v), veh/h	211	533	101	347	359	354	168	758	155	85	483	490
Grp Sat Flow(s),veh/h/ln	1767	1763	1537	1767	1763	1727	1767	1763	1539	1767	1763	1790
Q Serve(g_s), s	14.1	17.4	2.8	23.5	23.0	23.1	11.3	24.5	0.0	5.2	32.2	32.2
Cycle Q Clear(g_c), s	14.1	17.4	2.8	23.5	23.0	23.1	11.3	24.5	0.0	5.2	32.2	32.2
Prop In Lane	1.00		1.00	1.00		0.36	1.00		1.00	1.00		0.18
Lane Grp Cap(c), veh/h	239	660	454	349	446	437	187	893	700	248	507	515
V/C Ratio(X)	0.88	0.81	0.22	0.99	0.81	0.81	0.90	0.85	0.22	0.34	0.95	0.95
Avail Cap(c_a), veh/h	280	802	516	349	470	460	187	1072	779	248	510	518
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.95	0.95	0.95	0.42	0.42	0.42	0.75	0.75	0.75
Uniform Delay (d), s/veh	51.0	46.7	10.9	48.1	42.1	42.1	53.0	42.6	20.1	46.6	41.9	41.9
Incr Delay (d2), s/veh	24.1	5.1	0.2	45.3	13.8	14.3	20.7	2.5	0.1	0.6	23.3	23.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.7	7.9	1.3	14.5	11.4	11.3	6.0	10.7	2.6	2.3	17.0	17.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	75.0	51.8	11.2	93.4	55.9	56.5	73.7	45.1	20.1	47.2	65.2	65.0
LnGrp LOS	E	D	B	F	E	E	E	D	C	D	E	E
Approach Vol, veh/h	845		1060			1081			1058			
Approach Delay, s/veh	52.8		68.3			46.0			63.7			
Approach LOS	D		E			D			E			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	29.4	28.2	18.0	39.8	21.5	36.0	22.1	35.7				
Change Period (Y+Rc), s	5.7	* 5.7	5.3	5.3	5.3	5.7	5.3	5.3				
Max Green Setting (Gmax), s	27.3	* 27	12.7	34.7	19.0	32.0	10.9	36.5				
Max Q Clear Time (g_c+25.5), s	19.4	19.4	13.3	34.2	16.1	25.1	7.2	26.5				
Green Ext Time (p_c), s	0.0	2.3	0.0	0.3	0.2	2.4	0.0	3.8				

Intersection Summary

HCM 6th Ctrl Delay 57.9
HCM 6th LOS E

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

HCM 6th Signalized Intersection Summary 5: Ridley Ave & Guerneville Rd

Lance Drive Residential TIA
Cumulative Plus Project PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	800	40	84	977	20	20	10	57	20	10	20
Future Volume (veh/h)	20	800	40	84	977	20	20	10	57	20	10	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	0.99		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	22	860	42	90	1051	22	22	11	10	22	11	0
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	523	3092	151	585	3190	67	71	26	18	86	35	0
Arrive On Green	0.90	0.90	0.90	1.00	1.00	1.00	0.05	0.05	0.05	0.05	0.05	0.00
Sat Flow, veh/h	521	3421	167	613	3529	74	690	554	377	925	738	0
Grp Volume(v), veh/h	22	443	459	90	525	548	43	0	0	33	0	0
Grp Sat Flow(s), veh/h/ln	521	1763	1825	613	1763	1840	1621	0	0	1663	0	0
Q Serve(g_s), s	0.6	4.5	4.5	0.9	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.6	4.5	4.5	5.4	0.0	0.0	3.4	0.0	0.0	2.5	0.0	0.0
Prop In Lane	1.00		0.09	1.00		0.04	0.51		0.23	0.67		0.00
Lane Grp Cap(c), veh/h	523	1593	1650	585	1593	1663	115	0	0	121	0	0
V/C Ratio(X)	0.04	0.28	0.28	0.15	0.33	0.33	0.37	0.00	0.00	0.27	0.00	0.00
Avail Cap(c_a), veh/h	523	1593	1650	585	1593	1663	423	0	0	426	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.81	0.81	0.81	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.7	0.9	0.9	0.1	0.0	0.0	65.2	0.0	0.0	64.8	0.0	0.0
Incr Delay (d2), s/veh	0.1	0.4	0.3	0.0	0.0	0.0	0.7	0.0	0.0	0.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.4	0.4	0.0	0.0	0.0	1.5	0.0	0.0	1.2	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.8	1.2	1.2	0.1	0.0	0.0	65.9	0.0	0.0	65.2	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	E	A	A	E	A	A
Approach Vol, veh/h	924			1163			43			33		
Approach Delay, s/veh	1.2			0.1			65.9			65.2		
Approach LOS	A			A			E			E		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	130.4			9.6			130.4			9.6		
Change Period (Y+Rc), s	3.9			3.0			3.9			3.0		
Max Green Setting (Gmax), s	98.1			35.0			98.1			35.0		
Max Q Clear Time (g_c+I1), s	6.5			4.5			7.4			5.4		
Green Ext Time (p_c), s	1.9			0.1			2.6			0.1		

Intersection Summary

HCM 6th Ctrl Delay	2.8
HCM 6th LOS	A

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

6: Lance Dr & Guerneville Rd

Lance Drive Residential TIA
Cumulative Plus Project PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	118	693	20	70	1040	248	10	43	50	141	48	76
Future Volume (veh/h)	118	693	20	70	1040	248	10	43	50	141	48	76
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.99	0.99		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	123	722	20	73	1083	241	10	45	15	147	50	67
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	144	760	21	340	1158	504	58	232	71	199	55	73
Arrive On Green	0.16	0.43	0.43	0.06	0.11	0.11	0.19	0.19	0.19	0.19	0.19	0.19
Sat Flow, veh/h	1767	3501	97	1767	3526	1536	147	1206	369	828	284	378
Grp Volume(v), veh/h	123	363	379	73	1083	241	70	0	0	264	0	0
Grp Sat Flow(s), veh/h/ln	1767	1763	1836	1767	1763	1536	1721	0	0	1490	0	0
Q Serve(g_s), s	9.5	27.8	27.8	5.5	42.7	20.7	0.0	0.0	0.0	19.7	0.0	0.0
Cycle Q Clear(g_c), s	9.5	27.8	27.8	5.5	42.7	20.7	4.6	0.0	0.0	24.3	0.0	0.0
Prop In Lane	1.00		0.05	1.00		1.00	0.14		0.21	0.56		0.25
Lane Grp Cap(c), veh/h	144	383	399	340	1158	504	360	0	0	327	0	0
V/C Ratio(X)	0.86	0.95	0.95	0.21	0.94	0.48	0.19	0.00	0.00	0.81	0.00	0.00
Avail Cap(c_a), veh/h	211	903	940	340	1806	787	474	0	0	425	0	0
HCM Platoon Ratio	2.00	2.00	2.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.85	0.85	0.85	1.00	0.00	0.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	57.8	38.9	38.9	55.5	60.9	51.1	47.5	0.0	0.0	55.3	0.0	0.0
Incr Delay (d2), s/veh	14.2	5.7	5.5	0.1	13.2	2.7	0.1	0.0	0.0	6.5	0.0	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.4	10.1	10.5	2.5	22.4	8.9	2.1	0.0	0.0	9.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	72.0	44.5	44.4	55.6	74.1	53.9	47.6	0.0	0.0	61.8	0.0	0.0
LnGrp LOS	E	D	D	E	E	D	D	A	A	E	A	A
Approach Vol, veh/h	865			1397			70			264		
Approach Delay, s/veh	48.4			69.7			47.6			61.8		
Approach LOS	D			E			D			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	32.3	35.7		31.5	16.7	51.3		31.5				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		4.6				
Max Green Setting (Gmax), s	66.3	71.7		36.4	16.7	71.7		36.4				
Max Q Clear Time (g_c+11), s	5	29.8		26.3	11.5	44.7		6.6				
Green Ext Time (p_c), s	0.0	0.6		0.3	0.0	1.3		0.1				

Intersection Summary

HCM 6th Ctrl Delay 61.2

HCM 6th LOS E

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

7: N Dutton Ave/Westberry Dr & Guerneville Rd

Lance Drive Residential TIA
Cumulative Plus Project PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	799	145	530	1077	30	221	10	520	10	10	10
Future Volume (veh/h)	10	799	145	530	1077	30	221	10	520	10	10	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.97	1.00		0.99	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	11	859	148	570	1158	31	246	0	208	11	11	1
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	26	897	155	1492	2522	67	294	0	814	31	31	3
Arrive On Green	0.01	0.30	0.30	0.87	1.00	1.00	0.08	0.00	0.08	0.04	0.04	0.04
Sat Flow, veh/h	1767	2996	516	3428	3505	94	3534	0	1561	859	859	78
Grp Volume(v), veh/h	11	505	502	570	582	607	246	0	208	23	0	0
Grp Sat Flow(s), veh/h/ln	1767	1763	1750	1714	1763	1836	1767	0	1561	1796	0	0
Q Serve(g_s), s	0.9	39.4	39.4	4.5	0.0	0.0	9.6	0.0	0.0	1.8	0.0	0.0
Cycle Q Clear(g_c), s	0.9	39.4	39.4	4.5	0.0	0.0	9.6	0.0	0.0	1.8	0.0	0.0
Prop In Lane	1.00		0.30	1.00		0.05	1.00		1.00	0.48		0.04
Lane Grp Cap(c), veh/h	26	528	524	1492	1269	1321	294	0	814	64	0	0
V/C Ratio(X)	0.42	0.96	0.96	0.38	0.46	0.46	0.84	0.00	0.26	0.36	0.00	0.00
Avail Cap(c_a), veh/h	77	559	555	1492	1269	1321	371	0	848	355	0	0
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.92	0.92	0.92	0.46	0.46	0.46	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	68.4	48.2	48.2	5.4	0.0	0.0	63.2	0.0	18.7	65.9	0.0	0.0
Incr Delay (d2), s/veh	3.6	28.5	28.6	0.0	0.6	0.5	10.5	0.0	0.1	1.2	0.0	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	21.1	21.0	1.3	0.2	0.2	4.7	0.0	3.7	0.8	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	71.9	76.7	76.8	5.4	0.6	0.5	73.7	0.0	18.8	67.1	0.0	0.0
LnGrp LOS	E	E	E	A	A	A	E	A	B	E	A	A
Approach Vol, veh/h	1018			1759			454			23		
Approach Delay, s/veh	76.7			2.1			48.6			67.1		
Approach LOS	E			A			D			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	66.2	47.2		9.6	7.4	106.0		16.9				
Change Period (Y+Rc), s	5.3	5.3		4.6	5.3	5.3		5.3				
Max Green Setting (Gmax), s	32.3	44.4		27.7	6.1	71.0		14.7				
Max Q Clear Time (g_c+10), s	10.5	41.4		3.8	2.9	2.0		11.6				
Green Ext Time (p_c), s	0.1	0.5		0.0	0.0	1.0		0.0				

Intersection Summary

HCM 6th Ctrl Delay 32.4
HCM 6th LOS C

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 8: Herbert St/Coffey Ln & Guerneville Rd

Lance Drive Residential TIA
Cumulative Plus Project PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	201	1048	70	60	1357	110	50	30	40	120	30	270
Future Volume (veh/h)	201	1048	70	60	1357	110	50	30	40	120	30	270
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.99	1.00		0.94	1.00		0.95
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	218	1139	72	65	1475	116	54	33	26	130	33	94
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	211	1163	73	503	1694	132	83	51	40	175	45	371
Arrive On Green	0.24	0.69	0.69	0.28	0.51	0.51	0.10	0.10	0.10	0.12	0.12	0.12
Sat Flow, veh/h	1767	3358	212	1767	3310	259	818	500	394	1423	361	1488
Grp Volume(v), veh/h	218	597	614	65	782	809	113	0	0	163	0	94
Grp Sat Flow(s), veh/h/ln	1767	1763	1807	1767	1763	1806	1713	0	0	1784	0	1488
Q Serve(g_s), s	16.7	45.3	45.5	3.8	54.4	55.5	8.9	0.0	0.0	12.3	0.0	7.2
Cycle Q Clear(g_c), s	16.7	45.3	45.5	3.8	54.4	55.5	8.9	0.0	0.0	12.3	0.0	7.2
Prop In Lane	1.00		0.12	1.00		0.14	0.48		0.23	0.80		1.00
Lane Grp Cap(c), veh/h	211	611	626	503	902	925	175	0	0	220	0	371
V/C Ratio(X)	1.03	0.98	0.98	0.13	0.87	0.88	0.65	0.00	0.00	0.74	0.00	0.25
Avail Cap(c_a), veh/h	211	742	760	503	902	925	306	0	0	333	0	465
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.75	0.75	0.75	0.58	0.58	0.58	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	53.3	21.0	21.1	37.2	30.0	30.2	60.4	0.0	0.0	59.2	0.0	42.9
Incr Delay (d2), s/veh	62.8	26.8	26.7	0.0	6.7	7.1	1.5	0.0	0.0	1.8	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	14.3	14.7	1.7	23.7	24.8	4.0	0.0	0.0	5.7	0.0	2.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	116.1	47.8	47.7	37.2	36.7	37.3	61.9	0.0	0.0	61.1	0.0	43.0
LnGrp LOS	F	D	D	D	D	D	E	A	A	E	A	D
Approach Vol, veh/h	1429			1656			113			257		
Approach Delay, s/veh	58.2			37.0			61.9			54.5		
Approach LOS	E			D			E			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	45.2	53.8		22.2	22.0	77.0		18.9				
Change Period (Y+Rc), s	5.3	5.3		4.9	5.3	5.3		4.6				
Max Green Setting (Gmax), s	9.9	58.9		26.1	16.7	52.1		25.0				
Max Q Clear Time (g_c+1/5), s	15.8	47.5		14.3	18.7	57.5		10.9				
Green Ext Time (p_c), s	0.0	1.0		0.1	0.0	0.0		0.1				
Intersection Summary												
HCM 6th Ctrl Delay	47.9											
HCM 6th LOS	D											

HCM 6th Signalized Intersection Summary

9: Range Ave & Guerneville Rd

Lance Drive Residential TIA
Cumulative Plus Project PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	180	756	242	100	954	22	333	190	170	101	270	290
Future Volume (veh/h)	180	756	242	100	954	22	333	190	170	101	270	290
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	188	788	0	104	994	0	216	382	102	105	281	130
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	444	1664		126	1030		301	480	126	247	326	146
Arrive On Green	0.50	0.94	0.00	0.07	0.29	0.00	0.17	0.17	0.17	0.05	0.05	0.05
Sat Flow, veh/h	1767	3618	0	1767	3618	0	1767	2815	741	1767	2331	1042
Grp Volume(v), veh/h	188	788	0	104	994	0	216	250	234	105	210	201
Grp Sat Flow(s), veh/h/ln	1767	1763	0	1767	1763	0	1767	1856	1700	1767	1763	1611
Q Serve(g_s), s	9.4	3.2	0.0	8.1	38.9	0.0	16.2	18.1	18.5	8.1	16.6	17.4
Cycle Q Clear(g_c), s	9.4	3.2	0.0	8.1	38.9	0.0	16.2	18.1	18.5	8.1	16.6	17.4
Prop In Lane	1.00		0.00	1.00		0.00	1.00		0.44	1.00		0.65
Lane Grp Cap(c), veh/h	444	1664		126	1030		301	316	290	247	246	225
V/C Ratio(X)	0.42	0.47		0.83	0.97		0.72	0.79	0.81	0.42	0.85	0.89
Avail Cap(c_a), veh/h	444	1664		170	1030		422	443	406	302	301	275
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	0.67	0.67	0.00	0.88	0.88	0.00	1.00	1.00	1.00	0.52	0.52	0.52
Uniform Delay (d), s/veh	28.4	2.2	0.0	64.2	48.8	0.0	54.9	55.7	55.8	61.3	65.3	65.7
Incr Delay (d2), s/veh	0.2	0.6	0.0	14.4	18.3	0.0	1.5	4.1	5.4	0.2	8.6	13.5
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	0.9	0.0	4.2	19.5	0.0	7.4	8.8	8.4	3.8	8.5	8.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	28.6	2.8	0.0	78.6	67.2	0.0	56.4	59.7	61.3	61.5	74.0	79.2
LnGrp LOS	C	A		E	E		E	E	E	E	E	E
Approach Vol, veh/h	976		A	1098		A	700			516		
Approach Delay, s/veh	7.8			68.3			59.2			73.5		
Approach LOS	A			E			E			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.3	71.4		24.9	40.4	46.2		28.5				
Change Period (Y+Rc), s	5.3	5.3		5.3	5.3	5.3		4.6				
Max Green Setting (Gmax), s	48.7	48.7		23.9	21.3	40.9		33.4				
Max Q Clear Time (g_c+I10, s)	5.2	5.2		19.4	11.4	40.9		20.5				
Green Ext Time (p_c), s	0.0	0.9		0.2	0.0	0.0		0.4				

Intersection Summary

HCM 6th Ctrl Delay 49.2

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

Unsignalized Delay for [EBR, WBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary

10: Guerneville Rd & Steele Wy

Lance Drive Residential TIA
Cumulative Plus Project PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	885	122	160	963	12	83	50	190	381	60	30
Future Volume (veh/h)	20	885	122	160	963	12	83	50	190	381	60	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	20	903	97	163	983	12	68	75	102	433	0	15
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	599	2004	1023	210	1036	13	160	168	235	502	0	750
Arrive On Green	0.11	0.19	0.19	0.06	0.29	0.29	0.09	0.09	0.09	0.14	0.00	0.14
Sat Flow, veh/h	1767	3526	1550	3428	3567	44	1767	1856	1536	3534	0	1528
Grp Volume(v), veh/h	20	903	97	163	486	509	68	75	102	433	0	15
Grp Sat Flow(s), veh/h/ln	1767	1763	1550	1714	1763	1847	1767	1856	1536	1767	0	1528
Q Serve(g_s), s	1.4	31.8	5.7	6.6	37.8	37.8	5.1	5.4	8.4	16.8	0.0	0.0
Cycle Q Clear(g_c), s	1.4	31.8	5.7	6.6	37.8	37.8	5.1	5.4	8.4	16.8	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.02	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	599	2004	1023	210	512	537	160	168	235	502	0	750
V/C Ratio(X)	0.03	0.45	0.09	0.78	0.95	0.95	0.43	0.45	0.43	0.86	0.00	0.02
Avail Cap(c_a), veh/h	599	2004	1023	321	656	688	358	376	408	810	0	884
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.72	0.72	0.72	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	41.7	37.5	17.2	64.8	48.6	48.6	60.2	60.4	54.0	58.7	0.0	19.0
Incr Delay (d2), s/veh	0.0	0.5	0.1	2.8	18.7	18.1	0.7	0.7	0.5	3.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	15.2	2.9	2.9	19.1	19.9	2.3	2.6	3.3	7.7	0.0	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.7	38.0	17.3	67.5	67.3	66.8	60.9	61.1	54.4	61.8	0.0	19.0
LnGrp LOS	D	D	B	E	E	E	E	E	D	E	A	B
Approach Vol, veh/h	1020			1158			245			448		
Approach Delay, s/veh	36.1			67.1			58.3			60.3		
Approach LOS	D			E			E			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	3.5	84.5		24.8	52.4	45.6		17.2				
Change Period (Y+Rc), s	4.9	4.9		4.9	4.9	4.9		4.6				
Max Green Setting (Gmax), s	47.1			32.1	8.1	52.1		28.4				
Max Q Clear Time (g_c+1/3), s	33.8			18.8	3.4	39.8		10.4				
Green Ext Time (p_c), s	0.0	1.1		0.1	0.0	0.9		0.1				

Intersection Summary

HCM 6th Ctrl Delay 54.3

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

11: Cleveland Ave & Guerneville Rd

Lance Drive Residential TIA
Cumulative Plus Project PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↑↑↓		↰↱	↑↑	↱	↰	↑↓		↰	↑↓	
Traffic Volume (veh/h)	140	1246	90	370	1465	240	110	160	280	490	410	140
Future Volume (veh/h)	140	1246	90	370	1465	240	110	160	280	490	410	140
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	146	1298	86	385	1526	184	115	167	98	355	644	127
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	192	1710	113	430	1488	650	270	331	183	405	687	135
Arrive On Green	0.06	0.35	0.35	0.13	0.42	0.42	0.15	0.15	0.15	0.23	0.23	0.23
Sat Flow, veh/h	3428	4844	321	3428	3526	1541	1767	2169	1199	1767	2995	590
Grp Volume(v), veh/h	146	905	479	385	1526	184	115	134	131	355	399	372
Grp Sat Flow(s), veh/h/ln	1714	1689	1788	1714	1763	1541	1767	1763	1606	1767	1856	1729
Q Serve(g_s), s	5.9	33.2	33.2	15.5	59.1	11.0	8.3	9.7	10.6	27.1	29.5	29.6
Cycle Q Clear(g_c), s	5.9	33.2	33.2	15.5	59.1	11.0	8.3	9.7	10.6	27.1	29.5	29.6
Prop In Lane	1.00		0.18	1.00		1.00	1.00		0.75	1.00		0.34
Lane Grp Cap(c), veh/h	192	1192	631	430	1488	650	270	269	245	405	425	396
V/C Ratio(X)	0.76	0.76	0.76	0.90	1.03	0.28	0.43	0.50	0.54	0.88	0.94	0.94
Avail Cap(c_a), veh/h	198	1192	631	688	1488	650	270	269	245	456	478	446
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.45	0.45	0.45	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	65.1	40.0	40.0	60.3	40.5	26.5	53.8	54.4	54.7	52.0	53.0	53.0
Incr Delay (d2), s/veh	13.5	2.6	4.8	2.9	22.5	0.0	4.9	6.4	8.2	14.8	23.7	25.5
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	14.1	15.3	6.9	29.6	4.1	4.1	4.8	4.9	13.6	16.4	15.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	78.7	42.6	44.8	63.2	63.0	26.6	58.6	60.8	62.9	66.8	76.7	78.5
LnGrp LOS	E	D	D	E	F	C	E	E	E	E	E	E
Approach Vol, veh/h	1530			2095			380			1126		
Approach Delay, s/veh	46.8			59.8			60.9			74.2		
Approach LOS	D			E			E			E		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	22.4	54.3		26.3	12.8	64.0		37.0				
Change Period (Y+Rc), s	4.9	4.9		4.9	4.9	4.9		4.9				
Max Green Setting (Gmax), s	28.5	39.1		17.1	8.1	59.1		36.1				
Max Q Clear Time (g_c+I1), s	11.5	35.2		12.6	7.9	61.1		31.6				
Green Ext Time (p_c), s	0.1	1.1		0.1	0.0	0.0		0.5				

Intersection Summary

HCM 6th Ctrl Delay 59.2

HCM 6th LOS E

Notes

User approved pedestrian interval to be less than phase max green.

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 12: US 101 SB Ramps & Guerneville Rd

Lance Drive Residential TIA
Cumulative Plus Project PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑↑	↑	↑↑	↑↑					↑	↑	↑
Traffic Volume (veh/h)	0	1379	667	350	1662	0	0	0	0	350	80	423
Future Volume (veh/h)	0	1379	667	350	1662	0	0	0	0	350	80	423
Initial Q (Qb), veh	0	0	0	0	0	0				0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		1.00				1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1856	1856	1856	1856	0				1856	1856	1856
Adj Flow Rate, veh/h	0	1422	297	361	1713	0				420	0	402
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97				0.97	0.97	0.97
Percent Heavy Veh, %	0	3	3	3	3	0				3	3	3
Cap, veh/h	0	1774	533	406	1775	0				1515	0	674
Arrive On Green	0.00	0.35	0.35	0.12	0.50	0.00				0.43	0.00	0.43
Sat Flow, veh/h	0	5233	1522	3428	3618	0				3534	0	1572
Grp Volume(v), veh/h	0	1422	297	361	1713	0				420	0	402
Grp Sat Flow(s),veh/h/ln	0	1689	1522	1714	1763	0				1767	0	1572
Q Serve(g_s), s	0.0	35.5	22.1	14.5	65.7	0.0				10.8	0.0	27.5
Cycle Q Clear(g_c), s	0.0	35.5	22.1	14.5	65.7	0.0				10.8	0.0	27.5
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1774	533	406	1775	0				1515	0	674
V/C Ratio(X)	0.00	0.80	0.56	0.89	0.96	0.00				0.28	0.00	0.60
Avail Cap(c_a), veh/h	0	2066	621	541	2118	0				1515	0	674
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.43	0.43	0.55	0.55	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	41.1	36.7	60.8	33.5	0.0				25.9	0.0	30.7
Incr Delay (d2), s/veh	0.0	0.7	0.1	6.7	6.9	0.0				0.5	0.0	3.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	14.7	8.2	6.7	28.7	0.0				4.5	0.0	10.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	41.8	36.9	67.5	40.5	0.0				26.4	0.0	34.6
LnGrp LOS	A	D	D	E	D	A				C	A	C
Approach Vol, veh/h		1719			2074						822	
Approach Delay, s/veh		41.0			45.2						30.4	
Approach LOS		D			D						C	
Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	1.5	53.9		64.6		75.4						
Change Period (Y+Rc), s	4.9	4.9		4.6		4.9						
Max Green Setting (Gmax), s	2.5	57.1		46.4		84.1						
Max Q Clear Time (g_c+I10), s	1.5	37.5		29.5		67.7						
Green Ext Time (p_c), s	0.0	2.1		0.1		2.8						

Intersection Summary

HCM 6th Ctrl Delay	41.0
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary 13: US 101 NB Ramps & Guerneville Rd/Steele Ln

Lance Drive Residential TIA
Cumulative Plus Project PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↱↱			↱↱↱		↰	↰↱	↱			
Traffic Volume (veh/h)	501	1228	0	0	1193	280	819	10	400	0	0	0
Future Volume (veh/h)	501	1228	0	0	1193	280	819	10	400	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.98	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach	No			No			No					
Adj Sat Flow, veh/h/ln	1856	1856	0	0	1856	1856	1856	1856	1856			
Adj Flow Rate, veh/h	522	1279	0	0	1243	265	953	0	208			
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96			
Percent Heavy Veh, %	3	3	0	0	3	3	3	3	3			
Cap, veh/h	1026	2296	0	0	1320	281	992	0	442			
Arrive On Green	0.60	1.00	0.00	0.00	0.32	0.32	0.28	0.00	0.28			
Sat Flow, veh/h	3428	3618	0	0	4330	887	3534	0	1572			
Grp Volume(v), veh/h	522	1279	0	0	1008	500	953	0	208			
Grp Sat Flow(s),veh/h/ln	1714	1763	0	0	1689	1673	1767	0	1572			
Q Serve(g_s), s	12.3	0.0	0.0	0.0	40.7	40.7	37.2	0.0	15.3			
Cycle Q Clear(g_c), s	12.3	0.0	0.0	0.0	40.7	40.7	37.2	0.0	15.3			
Prop In Lane	1.00		0.00	0.00		0.53	1.00		1.00			
Lane Grp Cap(c), veh/h	1026	2296	0	0	1071	530	992	0	442			
V/C Ratio(X)	0.51	0.56	0.00	0.00	0.94	0.94	0.96	0.00	0.47			
Avail Cap(c_a), veh/h	1026	2296	0	0	1209	599	1247	0	555			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.72	0.72	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	22.2	0.0	0.0	0.0	46.5	46.6	49.6	0.0	41.7			
Incr Delay (d2), s/veh	0.1	0.7	0.0	0.0	12.7	21.2	13.9	0.0	0.3			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	4.0	0.2	0.0	0.0	18.8	19.8	17.8	0.0	5.9			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.3	0.7	0.0	0.0	59.3	67.7	63.5	0.0	42.0			
LnGrp LOS	C	A	A	A	E	E	E	A	D			
Approach Vol, veh/h	1801			1508			1161					
Approach Delay, s/veh	7.0			62.1			59.7					
Approach LOS	A			E			E					
Timer - Assigned Phs	2			5			6			8		
Phs Duration (G+Y+Rc), s	96.1			46.8			49.3			43.9		
Change Period (Y+Rc), s	4.9			4.9			4.9			4.6		
Max Green Setting (Gmax), s	81.1			26.1			50.1			49.4		
Max Q Clear Time (g_c+I1), s	2.0			14.3			42.7			39.2		
Green Ext Time (p_c), s	1.9			0.1			1.7			0.1		

Intersection Summary

HCM 6th Ctrl Delay	39.2
HCM 6th LOS	D

Notes










User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

14: Stony Point Rd/Marlow Rd & W College Ave

Lance Drive Residential TIA
Cumulative Plus Project PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	93	290	130	264	400	230	190	910	306	190	982	128
Future Volume (veh/h)	93	290	130	264	400	230	190	910	306	190	982	128
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	98	305	97	278	421	176	200	958	199	200	1034	124
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
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	260	375	117	426	572	236	222	1061	844	290	1073	129
Arrive On Green	0.15	0.14	0.14	0.24	0.24	0.24	0.13	0.30	0.30	0.16	0.34	0.34
Sat Flow, veh/h	1767	2632	820	1767	2420	1000	1767	3526	1545	1767	3164	379
Grp Volume(v), veh/h	98	202	200	278	305	292	200	958	199	200	576	582
Grp Sat Flow(s),veh/h/ln	1767	1763	1689	1767	1763	1657	1767	1763	1545	1767	1763	1780
Q Serve(g_s), s	7.0	15.5	16.1	19.8	22.4	22.8	15.6	36.5	3.7	14.9	44.9	45.0
Cycle Q Clear(g_c), s	7.0	15.5	16.1	19.8	22.4	22.8	15.6	36.5	3.7	14.9	44.9	45.0
Prop In Lane	1.00		0.49	1.00		0.60	1.00		1.00	1.00		0.21
Lane Grp Cap(c), veh/h	260	251	241	426	416	391	222	1061	844	290	598	604
V/C Ratio(X)	0.38	0.80	0.83	0.65	0.73	0.75	0.90	0.90	0.24	0.69	0.96	0.96
Avail Cap(c_a), veh/h	260	327	314	426	468	440	226	1136	877	290	601	606
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.39	0.39	0.39	1.00	1.00	1.00	0.32	0.32	0.32
Uniform Delay (d), s/veh	53.9	58.1	58.4	47.9	49.4	49.6	60.3	47.0	5.9	55.2	45.4	45.4
Incr Delay (d2), s/veh	0.9	10.5	13.4	1.4	2.1	2.4	33.8	9.7	0.1	2.2	13.1	13.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.2	7.6	7.7	8.8	10.0	9.6	9.0	17.1	1.5	6.8	21.3	21.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.8	68.7	71.8	49.3	51.5	52.0	94.1	56.7	6.0	57.4	58.5	58.7
LnGrp LOS	D	E	E	D	D	D	F	E	A	E	E	E
Approach Vol, veh/h	500				875		1357				1358	
Approach Delay, s/veh	67.2				50.9		54.8				58.5	
Approach LOS	E				D		D				E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	39.0	25.3	22.9	52.8	25.9	38.4	28.3	47.4				
Change Period (Y+Rc), s	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3				
Max Green Setting (Gmax), s	27.8	26.0	17.9	47.7	16.0	37.2	20.5	45.1				
Max Q Clear Time (g_c+0.1), s	21.8	18.1	17.6	47.0	9.0	24.8	16.9	38.5				
Green Ext Time (p_c), s	0.4	1.3	0.0	0.5	0.1	2.8	0.2	3.6				

Intersection Summary

HCM 6th Ctrl Delay 56.7

HCM 6th LOS E









Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary 15: N Dutton Ave & W College Ave

Lance Drive Residential TIA
Cumulative Plus Project PM (120-140 Seconds)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	100	670	120	220	900	213	170	406	150	365	596	160
Future Volume (veh/h)	100	670	120	220	900	213	170	406	150	365	596	160
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		0.98
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	104	698	113	229	938	207	177	423	121	380	621	141
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	127	746	121	296	1000	220	415	519	147	496	676	153
Arrive On Green	0.07	0.25	0.25	0.17	0.35	0.35	0.24	0.19	0.19	0.28	0.24	0.24
Sat Flow, veh/h	1767	3030	490	1767	2862	631	1767	2699	764	1767	2843	644
Grp Volume(v), veh/h	104	406	405	229	577	568	177	275	269	380	385	377
Grp Sat Flow(s),veh/h/ln	1767	1763	1758	1767	1763	1731	1767	1763	1700	1767	1763	1724
Q Serve(g_s), s	7.5	29.3	29.4	16.1	41.2	41.3	11.1	19.4	19.8	25.6	27.6	27.8
Cycle Q Clear(g_c), s	7.5	29.3	29.4	16.1	41.2	41.3	11.1	19.4	19.8	25.6	27.6	27.8
Prop In Lane	1.00		0.28	1.00		0.36	1.00		0.45	1.00		0.37
Lane Grp Cap(c), veh/h	127	434	433	296	616	604	415	339	327	496	419	410
V/C Ratio(X)	0.82	0.93	0.94	0.77	0.94	0.94	0.43	0.81	0.82	0.77	0.92	0.92
Avail Cap(c_a), veh/h	150	462	461	394	706	694	415	462	446	496	517	505
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.73	0.73	0.73	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	59.5	48.0	48.0	51.7	40.9	41.0	42.3	50.2	50.4	42.9	48.3	48.3
Incr Delay (d2), s/veh	17.2	20.0	20.3	4.5	17.8	18.4	0.3	5.4	6.4	6.4	17.2	18.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.0	15.1	15.1	7.5	20.6	20.3	4.9	9.0	8.9	11.8	13.9	13.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	76.7	68.0	68.3	56.2	58.8	59.4	42.5	55.6	56.8	49.3	65.5	66.4
LnGrp LOS	E	E	E	E	E	E	D	E	E	D	E	E
Approach Vol, veh/h	915				1374				721			
Approach Delay, s/veh	69.1				58.6				52.9			
Approach LOS	E				E				D			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	35.7	35.9	33.6	34.8	12.3	49.3	39.5	28.9				
Change Period (Y+Rc), s	3.9	* 3.9	3.0	3.9	3.0	3.9	3.0	3.9				
Max Green Setting (Gmax), s	29.0	* 34	15.0	38.1	11.0	52.1	19.0	34.1				
Max Q Clear Time (g_c+I1), s	11.0	31.4	13.1	29.8	9.5	43.3	27.6	21.8				
Green Ext Time (p_c), s	0.1	0.7	0.0	1.1	0.0	2.1	0.0	1.0				

Intersection Summary





HCM 6th Ctrl Delay	60.4
HCM 6th LOS	E

Notes

User approved pedestrian interval to be less than phase max green.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Intersection Delay, s/veh	9
Intersection LOS	A




Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	50	0	62	78	109	0	6	36	95	7	13
Future Vol, veh/h	7	50	0	62	78	109	0	6	36	95	7	13
Peak Hour Factor	0.86	0.86	0.92	0.92	0.86	0.86	0.92	0.92	0.92	0.86	0.92	0.86
Heavy Vehicles, %	3	3	2	2	3	3	2	2	2	3	2	3
Mvmt Flow	8	58	0	67	91	127	0	7	39	110	8	15
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.2	9.4	7.7	9
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	12%	25%	83%
Vol Thru, %	14%	88%	31%	6%
Vol Right, %	86%	0%	44%	11%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	42	57	249	115
LT Vol	0	7	62	95
Through Vol	6	50	78	7
RT Vol	36	0	109	13
Lane Flow Rate	46	66	285	133
Geometry Grp	1	1	1	1
Degree of Util (X)	0.055	0.087	0.335	0.181
Departure Headway (Hd)	4.373	4.716	4.235	4.881
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	817	759	849	735
Service Time	2.411	2.748	2.258	2.914
HCM Lane V/C Ratio	0.056	0.087	0.336	0.181
HCM Control Delay	7.7	8.2	9.4	9
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.2	0.3	1.5	0.7




HCM 6th TWSC
17: Iroquois St & Project Driveway (1)

Lance Drive Residential TIA
Cumulative Plus Project PM (120-140 Seconds)

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	5	8	107	106	3
Future Vol, veh/h	1	5	8	107	106	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	5	9	116	115	3
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	251	117	118	0	-	0
Stage 1	117	-	-	-	-	-
Stage 2	134	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	738	935	1470	-	-	-
Stage 1	908	-	-	-	-	-
Stage 2	892	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	733	935	1470	-	-	-
Mov Cap-2 Maneuver	733	-	-	-	-	-
Stage 1	902	-	-	-	-	-
Stage 2	892	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	9.1	0.5		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1470	-	894	-	-	
HCM Lane V/C Ratio	0.006	-	0.007	-	-	
HCM Control Delay (s)	7.5	0	9.1	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	




HCM 6th TWSC
18: Iroquois St & Project Driveway (2)

Lance Drive Residential TIA
Cumulative Plus Project PM (120-140 Seconds)

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	6	9	113	109	2
Future Vol, veh/h	2	6	9	113	109	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	7	10	123	118	2
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	262	119	120	0	-	0
Stage 1	119	-	-	-	-	-
Stage 2	143	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	727	933	1468	-	-	-
Stage 1	906	-	-	-	-	-
Stage 2	884	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	722	933	1468	-	-	-
Mov Cap-2 Maneuver	722	-	-	-	-	-
Stage 1	900	-	-	-	-	-
Stage 2	884	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	9.2	0.6		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1468	-	869	-	-	
HCM Lane V/C Ratio	0.007	-	0.01	-	-	
HCM Control Delay (s)	7.5	0	9.2	-	-	
HCM Lane LOS	A	A	A	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	




HCM 6th TWSC
19: Project Driveway (3) & Lance Dr

Lance Drive Residential TIA
Cumulative Plus Project PM (120-140 Seconds)

Intersection						
Int Delay, s/veh	1.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	178	3	43	246	3	27
Future Vol, veh/h	178	3	43	246	3	27
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	193	3	47	267	3	29
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	196	0	556	195
Stage 1	-	-	-	-	195	-
Stage 2	-	-	-	-	361	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1377	-	492	846
Stage 1	-	-	-	-	838	-
Stage 2	-	-	-	-	705	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1377	-	472	846
Mov Cap-2 Maneuver	-	-	-	-	472	-
Stage 1	-	-	-	-	838	-
Stage 2	-	-	-	-	677	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	1.1		9.8		
HCM LOS	A					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	784	-	-	1377	-	
HCM Lane V/C Ratio	0.042	-	-	0.034	-	
HCM Control Delay (s)	9.8	-	-	7.7	0	
HCM Lane LOS	A	-	-	A	A	
HCM 95th %tile Q(veh)	0.1	-	-	0.1	-	

HCM 6th TWSC
20: Guerneville Rd & Project Driveway (4)

Lance Drive Residential TIA
Cumulative Plus Project PM (120-140 Seconds)

Intersection						
Int Delay, s/veh	0.5					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	9	808	1086	20	13	5
Future Vol, veh/h	9	808	1086	20	13	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	878	1180	22	14	5
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	1202	0	-	0	1650	601
Stage 1	-	-	-	-	1191	-
Stage 2	-	-	-	-	459	-
Critical Hdwy	4.14	-	-	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	2.22	-	-	-	3.52	3.32
Pot Cap-1 Maneuver	576	-	-	-	90	443
Stage 1	-	-	-	-	251	-
Stage 2	-	-	-	-	603	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	576	-	-	-	87	443
Mov Cap-2 Maneuver	-	-	-	-	87	-
Stage 1	-	-	-	-	242	-
Stage 2	-	-	-	-	603	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.3	0		43.8		
HCM LOS	E					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	576	-	-	-	112	
HCM Lane V/C Ratio	0.017	-	-	-	0.175	
HCM Control Delay (s)	11.4	0.2	-	-	43.8	
HCM Lane LOS	B	A	-	-	E	
HCM 95th %tile Q(veh)	0.1	-	-	-	0.6	

APPENDIX C: TRAFFIC SIGNAL WARRANTS



Major Street	W Steele Ln
Minor Street	Iroquois St/Apple Valley Ln

Project	Lance Drive Residential TIA
Scenario	Near-Term with Project
Peak Hour	AM

Turn Movement Volumes

	NB	SB	EB	WB
Left	61	20	30	23
Through	10	10	370	310
Right	43	40	54	20
Total	114	70	454	353

Major Street Direction

	North/South
x	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	4

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	40.8
Approach with Worst Case Delay	NB
Total Vehicles on Approach	114

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	Peak Hour Volume on Minor Approach (vph)	Peak Hour Entering Volume Served (vph)
Near-Term with Project	1.3	114	991
Limiting Value	4	100	800
Condition Satisfied?	Not Met	Met	Met
Warrant Met	<u>NO</u>		

Major Street **W Steele Ln**
 Minor Street **Iroquois St/Apple Valley Ln**

Project **Lance Drive Residential TIA**
 Scenario **Near-Term with Project**
 Peak Hour **AM**

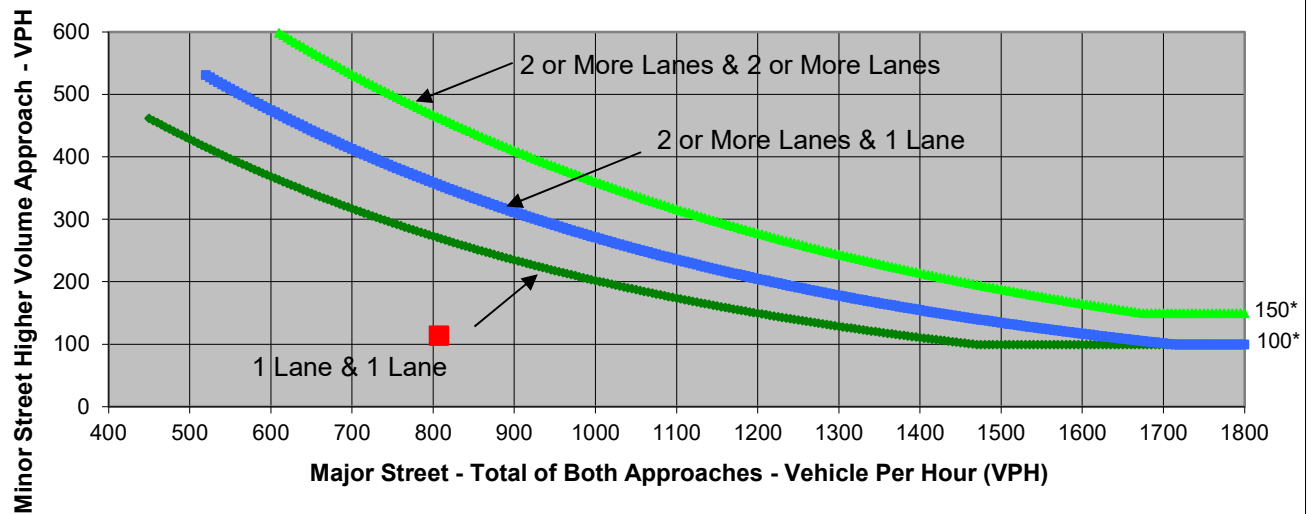
Turn Movement Volumes

	NB	SB	EB	WB
Left	61	20	30	23
Through	10	10	370	310
Right	43	40	54	20
Total	114	70	454	353

Major Street Direction

	North/South
x	East/West

Warrant 3B, Peak Hour



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	W Steele Ln	Iroquois St/Apple Valley Ln	
Number of Approach Lanes	2	1	<u>NO</u>
Traffic Volume (VPH) *	807	114	
* Note: Traffic Volume for Major Street is Total Volume of Both Approches. Traffic Volume for Minor Street is the Volume of High Volume Approach.			



Major Street	W Steele Ln
Minor Street	Iroquois St/Apple Valley Ln

Project	Lance Drive Residential TIA
Scenario	Cumulative with Project
Peak Hour	AM

Turn Movement Volumes

	NB	SB	EB	WB
Left	61	20	40	23
Through	10	10	420	360
Right	43	50	64	20
Total	114	80	524	403

Major Street Direction

	North/South
x	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	4

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	71.2
Approach with Worst Case Delay	NB
Total Vehicles on Approach	114

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	Peak Hour Volume on Minor Approach (vph)	Peak Hour Entering Volume Served (vph)
Cumulative with Project	2.3	114	1,121
Limiting Value	4	100	800
Condition Satisfied?	Not Met	Met	Met
Warrant Met	NO		

Major Street **W Steele Ln**
 Minor Street **Iroquois St/Apple Valley Ln**

Project **Lance Drive Residential TIA**
 Scenario **Cumulative with Project**
 Peak Hour **AM**

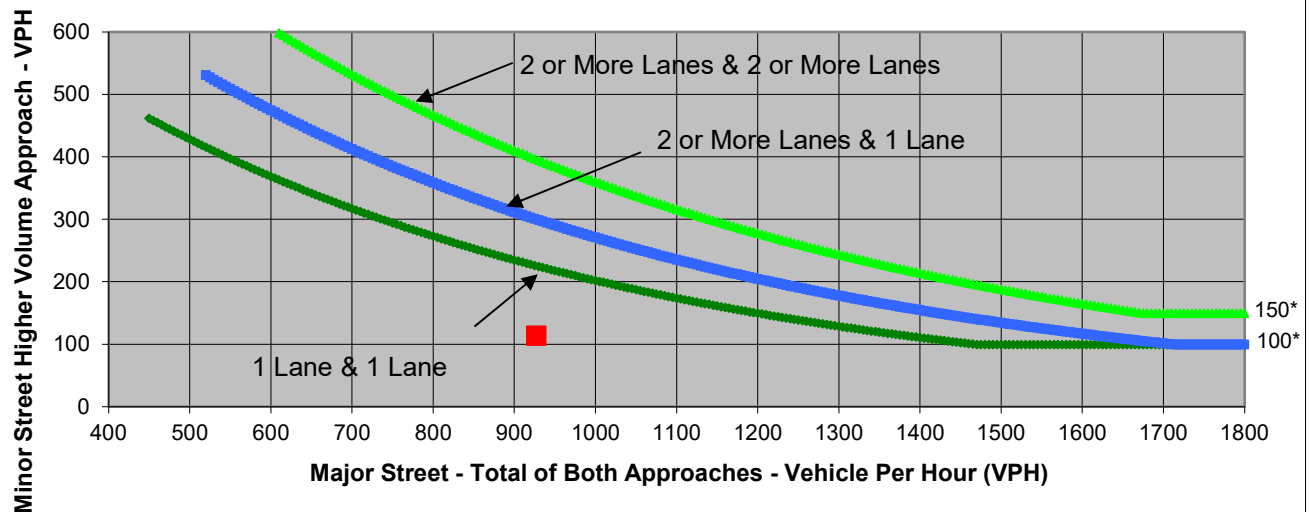
Turn Movement Volumes

	NB	SB	EB	WB
Left	61	20	40	23
Through	10	10	420	360
Right	43	50	64	20
Total	114	80	524	403

Major Street Direction

	North/South
x	East/West

Warrant 3B, Peak Hour



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	W Steele Ln	Iroquois St/Apple Valley Ln	
Number of Approach Lanes	2	1	<u>NO</u>
Traffic Volume (VPH) *	927	114	
* Note: Traffic Volume for Major Street is Total Volume of Both Approches. Traffic Volume for Minor Street is the Volume of High Volume Approach.			



Major Street	W Steele Ln
Minor Street	Iroquois St/Apple Valley Ln

Project	Lance Drive Residential TIA
Scenario	Cumulative with Project
Peak Hour	PM

Turn Movement Volumes

	NB	SB	EB	WB
Left	59	30	30	65
Through	10	20	340	530
Right	30	30	64	50
Total	99	80	434	645

Major Street Direction

	North/South
x	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	4

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	55.4
Approach with Worst Case Delay	NB
Total Vehicles on Approach	99

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	Peak Hour Volume on Minor Approach (vph)	Peak Hour Entering Volume Served (vph)
Cumulative with Project	1.5	99	1,258
Limiting Value	4	100	800
Condition Satisfied?	Not Met	Not Met	Met
Warrant Met	NO		

Major Street **W Steele Ln**
 Minor Street **Iroquois St/Apple Valley Ln**

Project **Lance Drive Residential TIA**
 Scenario **Cumulative with Project**
 Peak Hour **PM**

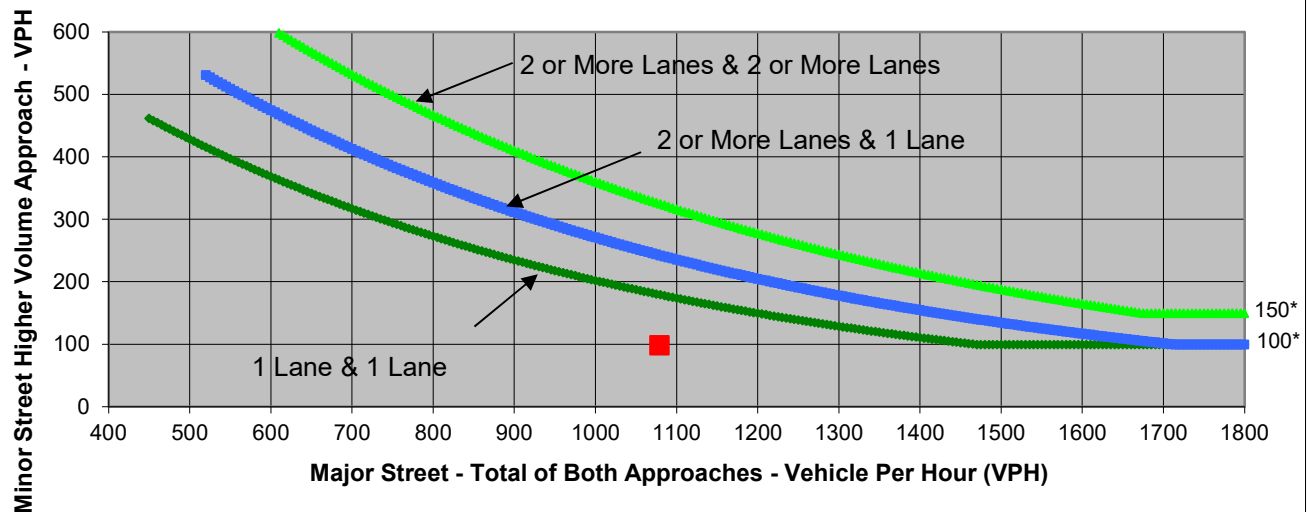
Turn Movement Volumes

	NB	SB	EB	WB
Left	59	30	30	65
Through	10	20	340	530
Right	30	30	64	50
Total	99	80	434	645

Major Street Direction

	North/South
x	East/West

Warrant 3B, Peak Hour



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	W Steele Ln	Iroquois St/Apple Valley Ln	
Number of Approach Lanes	2	1	<u>NO</u>
Traffic Volume (VPH) *	1,079	99	
* Note: Traffic Volume for Major Street is Total Volume of Both Approches. Traffic Volume for Minor Street is the Volume of High Volume Approach.			



Major Street	W Steele Ln
Minor Street	Iroquois St/Apple Valley Ln

Project	Lance Drive Residential TIA
Scenario	Cumulative with Project
Peak Hour	PM

Turn Movement Volumes

	NB	SB	EB	WB
Left	0	13	9	0
Through	0	0	818	1,106
Right	0	5	0	20
Total	0	18	827	1,126

Major Street Direction

	North/South
x	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	1
Total Approaches	3

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	45.6
Approach with Worst Case Delay	SB
Total Vehicles on Approach	18

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	Peak Hour Volume on Minor Approach (vph)	Peak Hour Entering Volume Served (vph)
Cumulative with Project	0.2	18	1,971
Limiting Value	4	100	650
Condition Satisfied?	Not Met	Not Met	Met
Warrant Met	<u>NO</u>		

Major Street **Guerneville Rd**
 Minor Street **Project Driveway (4)**

Project **Lance Drive Residential TIA**
 Scenario **Cumulative with Project**
 Peak Hour **PM**

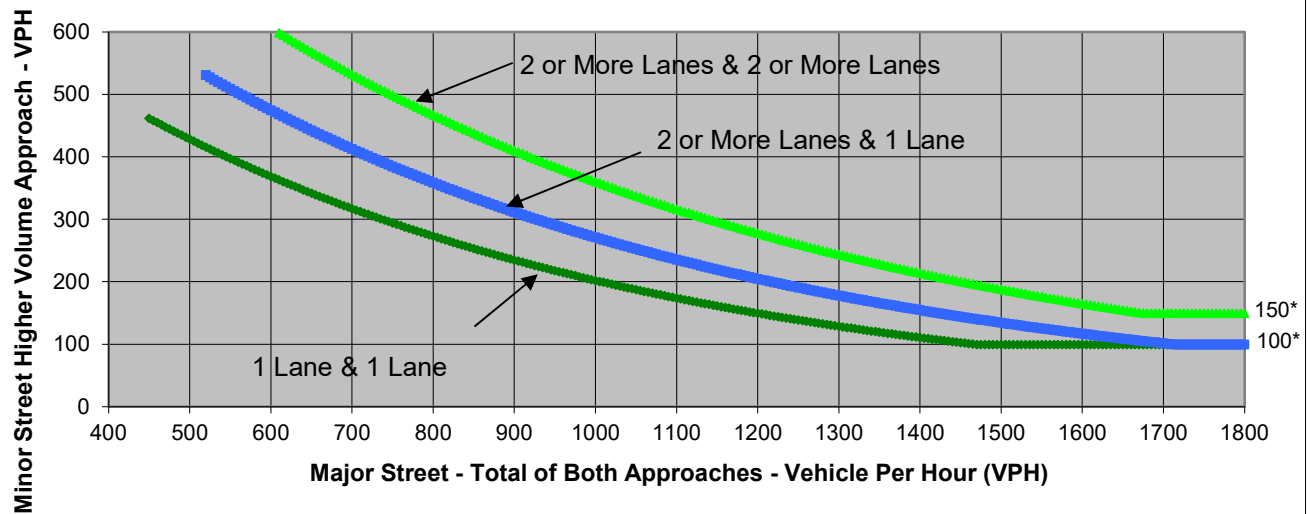
Turn Movement Volumes

	NB	SB	EB	WB
Left		13	9	
Through			818	1,106
Right		5		20
Total	0	18	827	1,126

Major Street Direction

	North/South
x	East/West

Warrant 3B, Peak Hour



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Guerneville Rd	Project Driveway (4)	
Number of Approach Lanes	2	1	<u>NO</u>
Traffic Volume (VPH) *	1,953	18	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
 Traffic Volume for Minor Street is the Volume of High Volume Approach.