ATTACHMENT B

FINAL INITIAL STUDY – MITIGATED NEGATIVE DECLARATION

COUNTY OF SANTA BARBARA

Planning and Development

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Final Initial Study-Mitigated Negative Declaration

Orcutt Community Plan Amendment

Case Numbers: 18GPA-00000-00001, 19NGD-00000-00013

October 6, 2020

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FINAL INITIAL STUDY-MITIGATED NEGATIVE DECLARATION

In accordance with Section 15074 of the California Environmental Quality Act (CEQA) Guidelines, the County of Santa Barbara (County), as the lead agency, has reviewed the comments received on the Draft Initial Study-Mitigated Negative Declaration (IS-MND) for the Orcutt Community Plan Amendment (project).

The Draft IS-MND was circulated for a 30-day public review period that began May 28, 2020 and concluded on June 29, 2020.

The Draft IS-MND with any necessary revisions collectively comprise the Final IS-MND for the project. Any changes made to the text of the Draft IS-MND to correct information, data, or intent, other than minor typographical corrections or minor working changes, are noted in the Final IS-MND as changes from the Draft IS-MND. Changes in the Draft IS-MND text are signified by strikeout font (~~strikeout~~) where text is removed and by underline font (underline) where text is added.

In addition, the Mitigation Monitoring and Reporting Program (MMRP) for the Orcutt Community Plan Amendment Project accompanies the Final IS-MND. Public Resources Code Section 21081.6(a)(1) requires that a lead agency adopt an MMRP before approving a project to mitigate or avoid significant impacts that have been identified in an IS-MND. The MMRP is included as Attachment 9 of the Final IS-MND.

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1.0 REQUEST/PROJECT DESCRIPTION

1.1 OVERVIEW

The County of Santa Barbara (County) is proposing an amendment to the Orcutt Community Plan (i.e., processing a General Plan Amendment [GPA]) to include a new local road connection between the Union Valley Parkway/U.S. Highway 101 interchange and the adjoining frontage road (commonly referred to as Rodeo Drive) on the east side of U.S. Highway 101 (herein referred to as "proposed project" or "project"). The community of Orcutt is located in unincorporated Santa Barbara County, immediately south of the city of Santa Maria (Figure 1). The study area for the project (study area) is located in Key Site 33 of the Orcutt Community Plan Area and includes the northbound U.S. Highway 101, as well as land to the east of U.S. Highway 101 from approximately 1,000 feet south of Santa Maria Way to approximately 1,900 feet south of Union Valley Parkway. Figure 2 shows the boundaries of the Orcutt Community Plan Area, and Figure 3 shows the study area.

The proposed GPA would amend the Transportation subsection of the Orcutt Community Plan and the associated Orcutt Community Plan Circulation Map. The project would not change existing land use or zoning designations, or affect any other aspect of the Orcutt Community Plan.

1.2 PROJECT OBJECTIVE

The purpose of the proposed GPA is to amend the Orcutt Community Plan to show a second point of access to the existing development east of U.S. Highway 101 via a new local road connection from the Union Valley Parkway/U.S. Highway 101 interchange and to classify Rodeo Drive as a Secondary 1 (Class S-1) roadway in the Transportation subsection of the Orcutt Community Plan. <u>According to the Orcutt Community Plan, secondary roadways are two lane roads designed to provide principal access to residential areas to connect streets of higher classifications (i.e., primary roadways) to permit adequate traffic circulation (page 147).</u>

Currently, Santa Maria Way and the associated Santa Maria Way/U.S. Highway 101 interchange provide the single point of public access to the area east of U.S. Highway 101 between the Santa Maria Way and Union Valley Parkway interchanges. <u>This point of access currently serves the Santa Maria Elks Unocal Event Center, a pet grooming business, and surrounding farmland. The Santa Maria Joint Union High School District (SMJUHSD) is constructing a new Agricultural Education and Career Technical Center that will also use this same point of access.</u> Santa Maria Way and the existing Santa Maria Way/U.S. Highway 101 interchange experience high traffic volumes and congestion during rodeos, concerts, and other events at the Santa Maria Elks Unocal Event Center. As a result, the Santa Maria Elks currently contract with the California Highway Patrol to direct traffic during large events.

The proposed local road connection would improve access <u>to the area</u>, relieve congestion, and reduce emergency response times during events at the Santa Maria Elks Unocal Event Center, and therefore, would help reduce overall vehicle miles traveled (VMT), and improve safety and emergency vehicle access along Santa Maria Way.

1.3 PROJECT DESCRIPTION

This Initial Study-Mitigated Negative Declaration (IS-MND) evaluates the potential environmental impacts related to amending the Orcutt Community Plan. The proposed project is in its initial phase, as approval of the GPA and the Final MND for the project would not result in any physical development or construction activities. The actual building of the proposed future roadway will require additional review and approval through the California Department of Transportation (Caltrans) Project Development Process. Caltrans might also require additional project-level environmental review and documentation in compliance with the California Environmental Quality Act (CEQA).

Project Design

The Orcutt Community Plan Circulation Map would be amended to include a new local road connection between the Union Valley Parkway/U.S. Highway 101 interchange and Rodeo Drive on the east side of U.S. Highway 101 (Figure 5). The future local road connection near the existing highway interchange would likely be constructed primarily at grade level and of similar materials (asphalt) as the existing roadway to which the future road would connect. The proposed project would allow all motorists to use the future road connection to access northbound and southbound U.S. Highway 101 either from Santa Maria Way (as allowed under current conditions) or from Union Valley Parkway. As part of the proposed project, Rodeo Drive would also be improved to meet County Engineering Design ~~s~~Standards for a Collector Road. According to the County Engineering Design Standards, collector roads are primarily used to move traffic to and from local roads to arterial roads (County of Santa Barbara 2011). See Attachment 1 for conceptual design drawings.

Existing Allowed Uses

The proposed project would serve local traffic, as well as traffic generated by the Elks Unocal Event Center, which has an active Conditional Use Permit (CUP; Case No. 95-CP-014) that allows the following uses to occur at the Elks Unocal Event Center:

- 7,846-seat grandstand
- 60 events per "event year," which occurs from May 1 through April 30
- Maximum occupancy of 8,000 people per day
- Up to 10 events per year with between 5,000 and 8,000 people
- Up to 40 events with a maximum occupancy of 5,000 people
- Recreational vehicle parking area without individual hookups for a maximum of 100 recreational vehicle units

As part of Substantial Conformity Determination (SCD) No. 06SCD-00000-00043, up to 10 events related to BMX bicycles, with a maximum occupancy of 300 people per event, are allowed at the Elks Unocal Event Center. In addition, SCD, Case No. 11SCD-00000-00012, allows 11 paintball events with 50 to 100 people per day as part of the allowed 60 events per event year at the Elks Unocal Event Center. The active CUP also requires preparation of a Traffic Plan for each event larger than 3,500 people. The U.S. Forest Service and local fire departments also use the Elks Unocal Event Center as a staging area during large wildfire events in the region. The environmental baseline is existing use of Rodeo Drive.

1.4 PROJECT APPROVALS/NEXT STEPS

The proposed project would amend the Orcutt Community Plan to include the future local road connection. However, it is currently unknown whether a developer or public agency would fund and construct the project. Therefore, the mitigation measures in this document account for the fact that the project proponent is currently unknown. Implementation of the road connection would require additional sequential approvals and actions by multiple agencies, including, but not limited to, the following:

- Inclusion of the proposed project in the Regional Transportation Plan by the Santa Barbara County Association of Governments (SBCAG)
- Preparation of the Project Initiation Document (Project Study Report – Project Development Support) and associated environmental documentation to be coordinated with and approved by Caltrans
- Completion of an Intersection Control Evaluation for review by Caltrans
- Approval of ~~Project Report or~~ Project Study Report by the California Transportation Commission

- Concurrence and documentation from Caltrans and the California Transportation Commission to alter existing access denial line and approve a new connection to U.S. Highway 101, following the procedures outlined in Chapter 27 of the Caltrans Project Development Procedures Manual
- Acquisition of the right-of-way
- A revision or amendment to Caltrans' existing ~~Approval of a~~ Superseding Freeway Agreement ~~by Caltrans~~
- Coordination with Caltrans regarding the new Project Delivery Quality Management Assessment Process and/or other processes as may be appropriate
- Encroachment Permit from ~~Caltrans and/or~~ the County

Figure 1 Regional Location Map

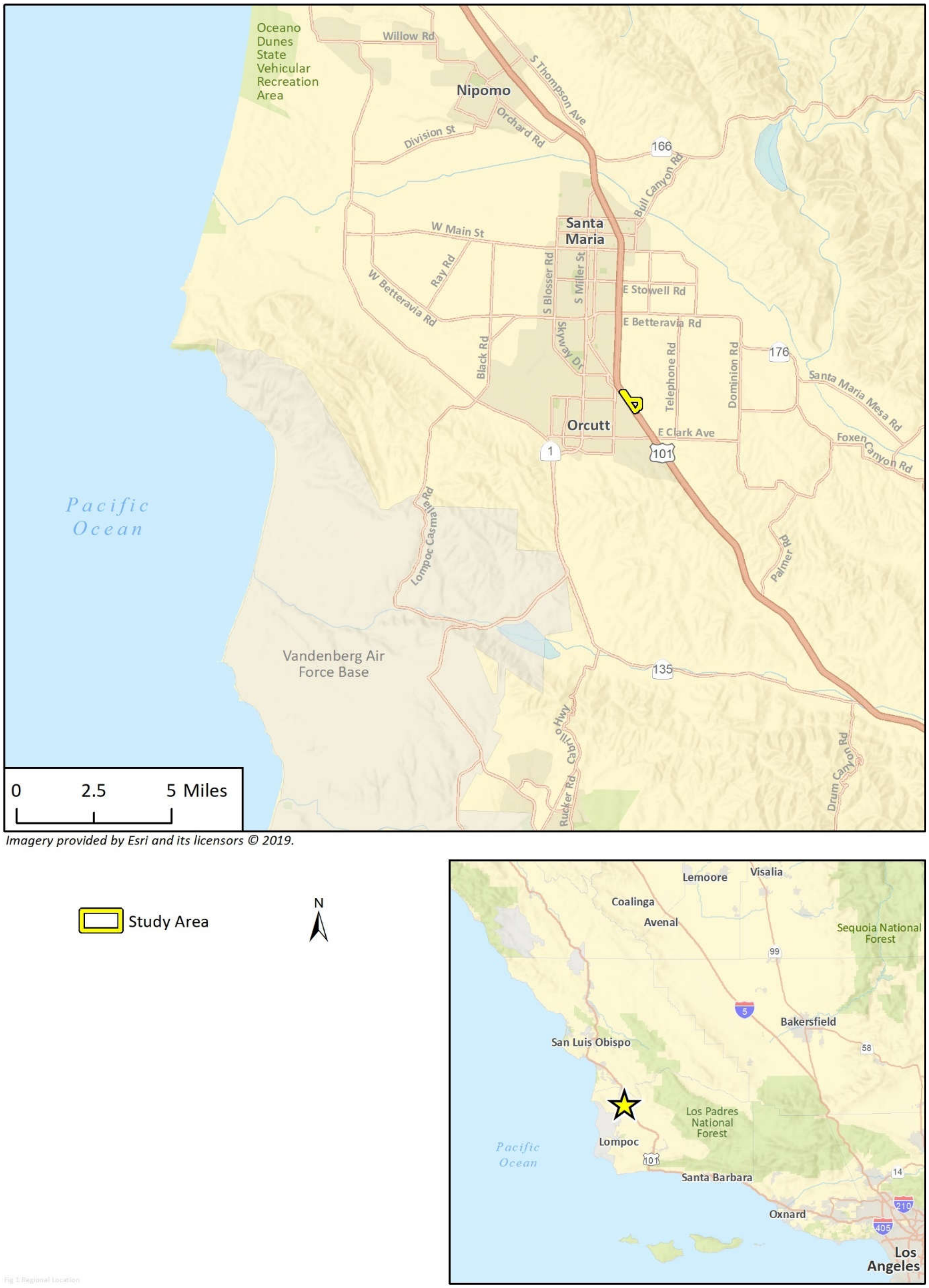

Figure 2 Orcutt Community Plan Area

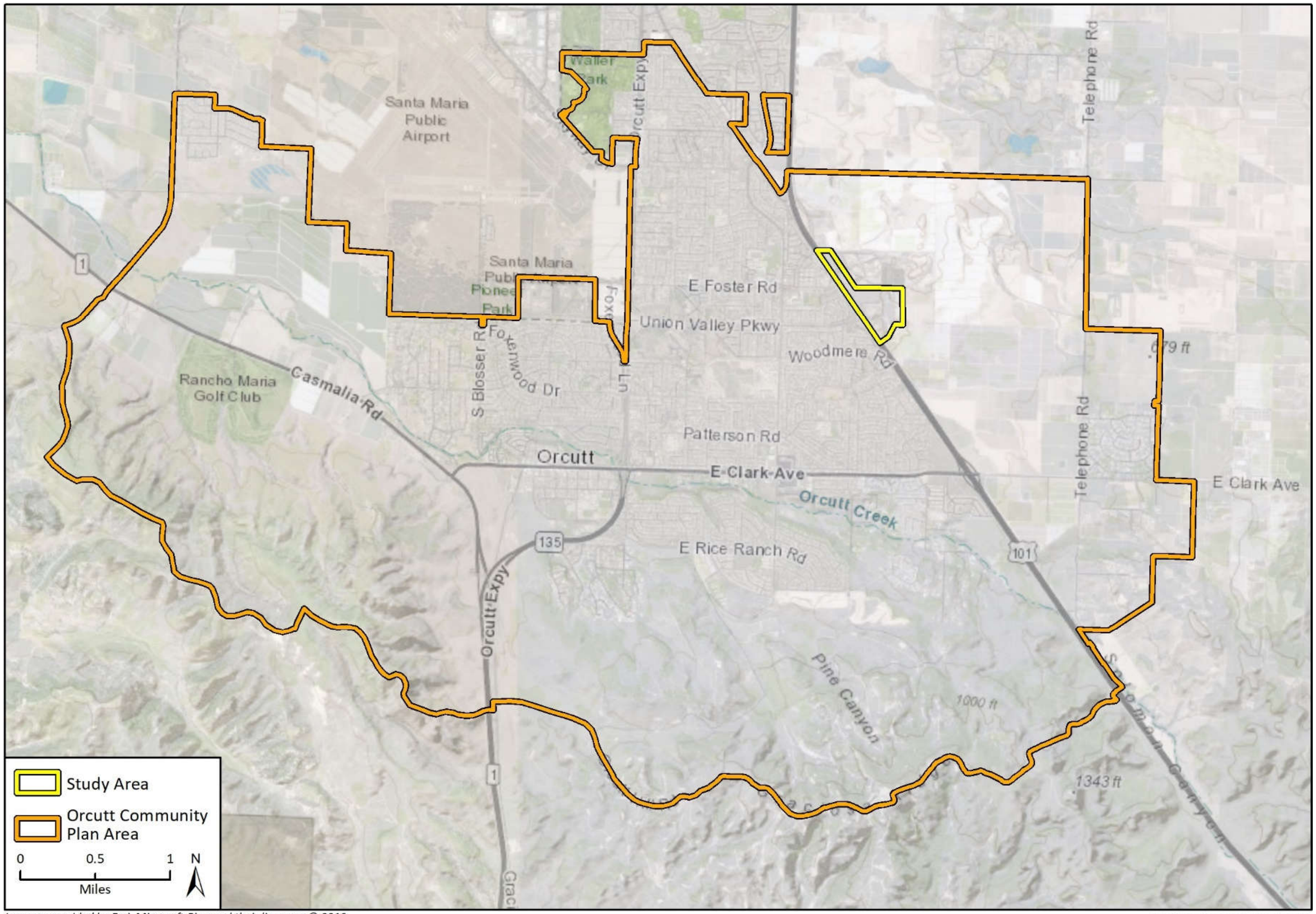

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Fig 2 Orcutt Community Planning Area

Figure 3 Study Area

APN	Owner
107-240-005	ELKS RECREATION INC
107-240-008	STABEN, JEANNE L TRUST 3/9/07
107-240-027	JIMMIE L AND ATHA A JANTZ FAMILY TRUST
107-300-036	WEST BAY COMPANY
107-240-043	JANTZ, JIMMIE J & ATHA A FAMILY TRUST
107-240-044	JIMMIE L AND ATHA A JANTZ FAMILY TRUST

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Figure 4 Key Site 33

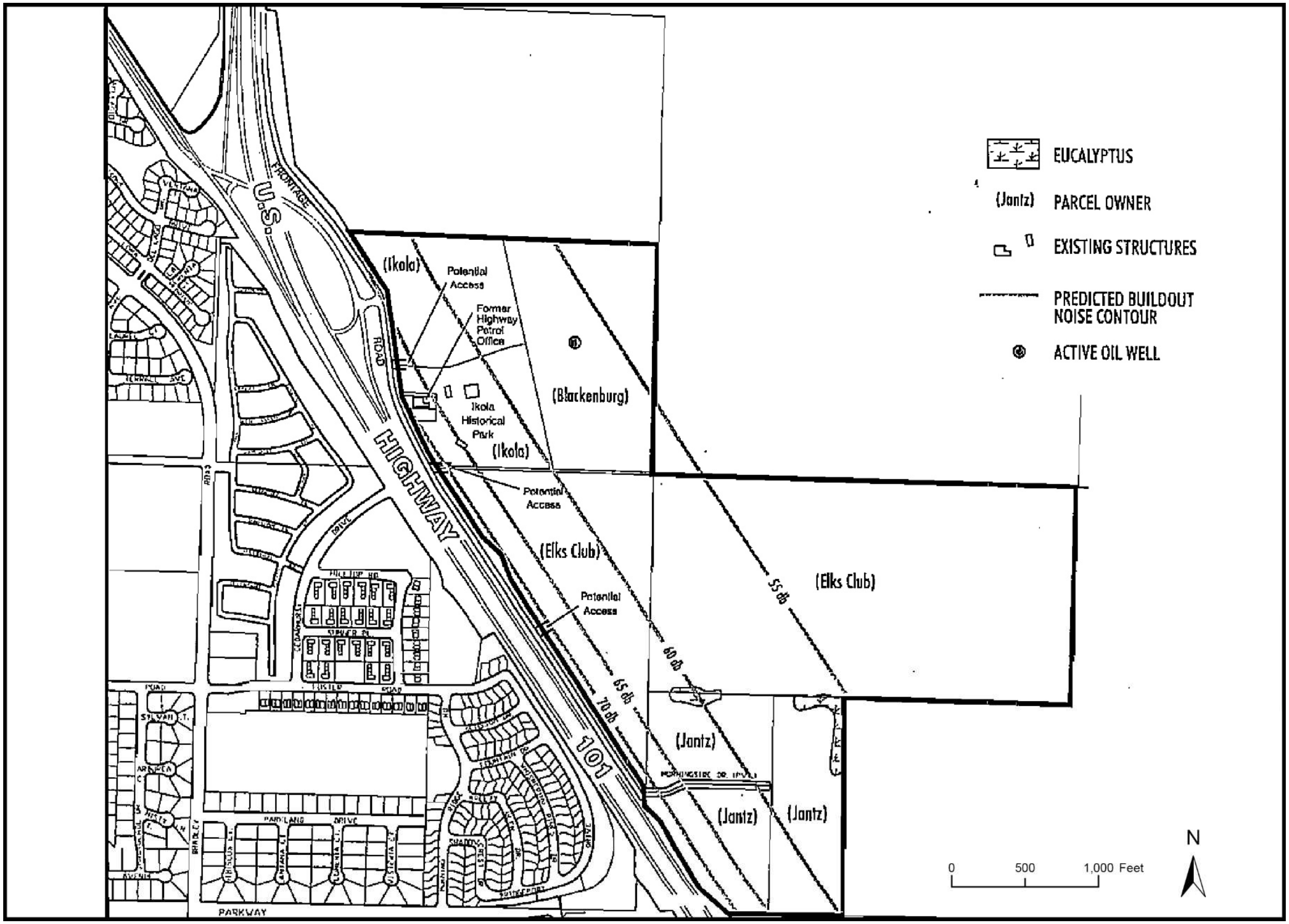
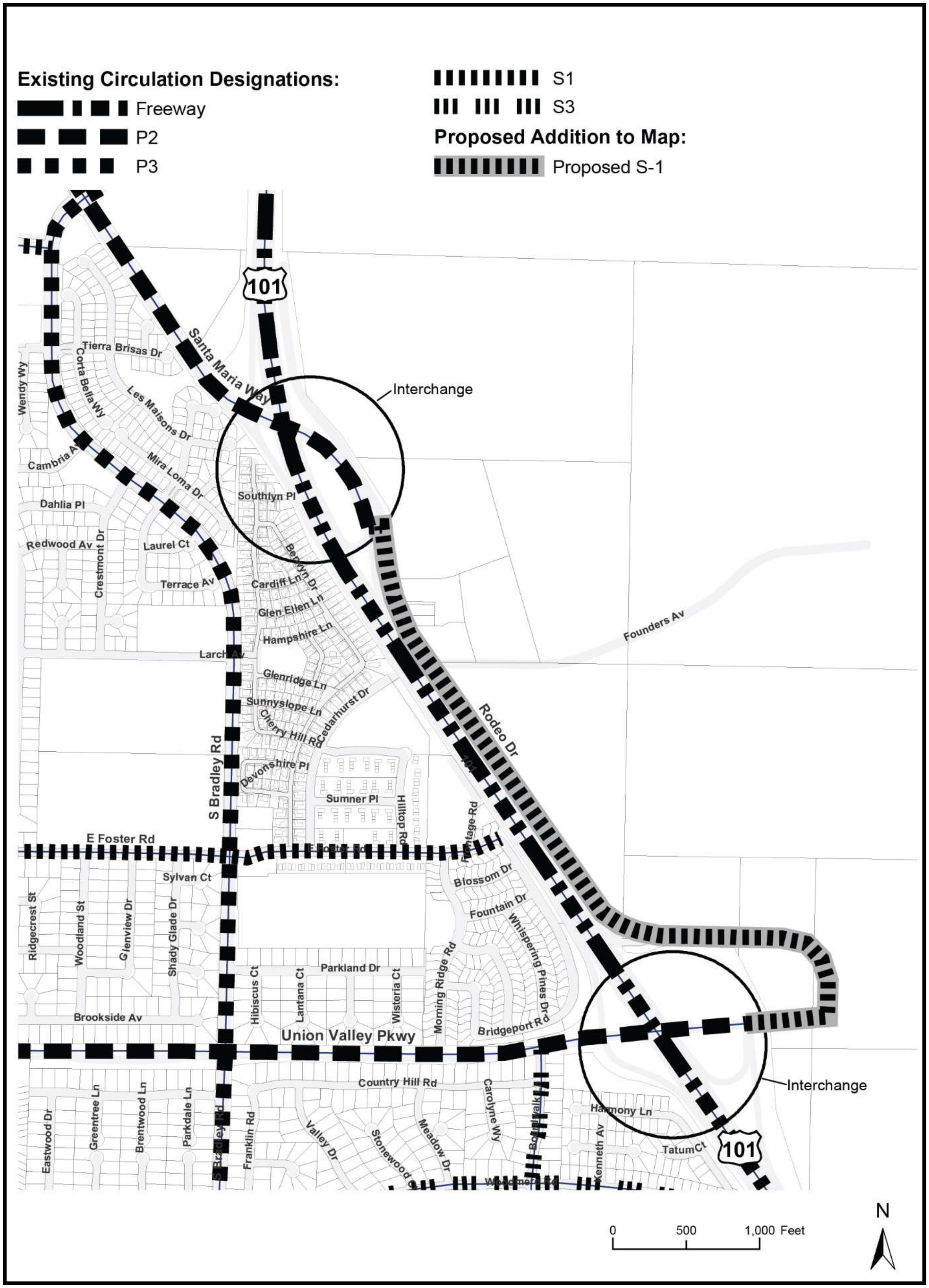


Figure 5 Orcutt Community Plan Circulation Map Change



2.0 PROJECT LOCATION

The study area is located in the northeastern portion of the community of Orcutt in unincorporated Santa Barbara County and east of U.S. Highway 101 between the U.S. Highway 101/Union Valley Parkway and U.S. Highway 101/Santa Maria Way interchanges. The study area is part of Key Site 33 and includes Rodeo Drive (which runs parallel to U.S. Highway 101), a private easement (which traverses from the southern terminus of Rodeo Drive to the east and south), and a portion of Morningside Drive (a private, gated access road, located just north of the west-east portion of the private easement). The Orcutt Community Planning Area contains 43 “Key Sites.” The County previously identified within each Key Site the areas suitable for development, as well as constrained areas within each Key Site. The Orcutt Community Plan anticipates some growth in Key Site 33, east of U.S. Highway 101, including the Elks Unocal Event Center (currently existing), three motels with up to 80 rooms each, two drive-thru fast food restaurants, and a convenience market/gas station. Figure 4 (above) shows the boundaries of Key Site 33.

The project would affect the following parcels, as well as portions of the Caltrans and County public rights-of-way: Assessor’s Parcel Numbers (APNs) 107-240-005, 107-240-008, 107-240-027, 107-240-043, and 107-240-044. Figure 1 (above) shows the regional location of the study area to understand its context within the greater Santa Barbara County area and adjacent counties. Figure 3 (above) shows the boundaries of the study area and roadways within and adjacent to the study area. Table 1 summarizes land use, access, and public services applicable to the project.

Table 1 Land Use and Public Services

Study Area Information	
Comprehensive Plan Designation	Agriculture II (AG-II-100) and Highway Commercial (H)
Zoning District, Ordinance	Agriculture II (AG-II-100) and Highway Commercial (CH)
Study Area Size	73.6 acres
Present Use & Development	Agriculture and roadways
Surrounding Uses/Zoning	North: Agriculture (AG-II-100) South: Agriculture (AG-II-100) East: Agriculture and Elks Unocal Event Center (AG-II-100), Highway Commercial (CH) West: U.S. Highway 101
Access	U.S. Highway 101, Santa Maria Way, and Rodeo Drive
Public Services	Water Supply Golden State Water ~~N/A~~ Sewage: Laguna County Sanitation ~~N/A~~ Fire: Santa Barbara County Fire Department, Fire Station #22 Other: Pacific Gas and Electric, Southern California Gas ~~N/A~~ District: Fourth Supervisorial District

3.0 ENVIRONMENTAL SETTING

3.1 PHYSICAL SETTING

The study area contains the northbound lanes of U.S. Highway 101, the eastern cul-de-sac terminus of Union Valley Parkway, the northbound U.S. Highway 101 on- and off-ramps at the Union Valley Parkway interchange, Rodeo Drive (a two-lane frontage road), a private easement that continues at the southern terminus of Rodeo Drive serving agricultural uses to the south, and a portion of Morningside Drive (a private, gated, access road), all of which are paved roadways. The remainder of the study area consists of agricultural land currently used for berry production, a portion of the western part of the Elks Unocal Event Center, fallow agricultural land, water wells and a shared private water system, and a Caltrans-owned detention basin for stormwater runoff, located just north of Union Valley Parkway to the east of U.S. Highway 101. The study area contains four vegetation communities and land cover types: non-native perennial grassland, developed, agricultural, and ruderal. The developed portions of the study area have been altered and cleared to the extent that native vegetation is no longer supported.

The study area generally slopes from northwest to southeast and ranges in elevation from approximately 366 to 530 feet above mean sea level. Soils in the study area are composed primarily of Marina sand and Oceano sand soil units. To the south and north of the study area is active agricultural land. To the east of the study area are most of the Elks Unocal Event Center and active agricultural land, and to the west are the southbound lanes of U.S. Highway 101 and single- and multi-family residences.

3.2 ENVIRONMENTAL BASELINE

The environmental baseline from which the project's impacts are determined consists of the physical environmental conditions in the vicinity of the study area, as previously described.

3.3 CUMULATIVE IMPACTS METHODOLOGY

The discussion of cumulative impacts contained in this IS-MND is based on a list of past, present, and probable future projects producing related or cumulative impacts (CEQA Guidelines Section 15130[b][1][A]). Table 2 summarizes the list of projects included in the cumulative impact analysis.

Table 2 Cumulative Projects List

No.	Project Name	Location (APN)	Description	Project Status
County of Santa Barbara[1]				
1	Key Site #4, Clark Avenue Commercial	103-750-038	4,000 square feet of commercial	Under construction
2	Key Site #3, Development Plan	129-151-026	125 single-family residences and 160 multi-family residences	Under County review
3	Key Site #30, Development Plan	107-250-008	64-unit multi-family residential complex and 212-unit multi-family residential complex	Under construction (64 multi-family residential complex complete and 150 multi-family residences of 212 total units complete)

No.	Project Name	Location (APN)	Description	Project Status
4	Key Site #2, Orcutt Gateway Retail Center	129-280-001	49,921 square feet of commercial space	Approved
5	Key Site #1, Orcutt Public Marketplace	129-120-024	252 single-family residences and 211,264 square feet of commercial space	Under County review
6	Terrace Villas (Stillwell and Clark)	129-300-001 through -020	16 single-family residences	Approved
City of Santa Maria[2]				
7	2811 Center	111-231-300	51,200 square feet of office space in two buildings	Under construction (one 25,600-square-foot building constructed)
8	Platino Development	111-291-035, -036, -038, and -039	48,717 square feet of industrial use in four buildings on four lots	Approved; no building permit submitted; extension pending
9	Northman Residential	109-010-005 and -006	63 single-family residences	Approved
10	Skyway Office Building	111-291-044	19,800-square-foot, 2-story office building	Under construction
11	Lakeview Mixed Use	111-100-008	230 multi-family residences and 11,000 square feet of commercial space	Approved
Santa Maria Joint Union High School District[3]				
12	Agricultural Education and Career Technical Center	107-150-013	High school for up to 198 students with six classrooms; maximum buildout of 298 students	Under construction
Expected Development of Key Site 33 under Orcutt Community Plan[4]				
13	Key Site #33	107-150-018, -020, -021, and -022; and 107-240-027, -043, and -044	240 motel rooms in three motels, 5,000 square feet of drive-thru fast food restaurants (two restaurants), and an 1,800-square-foot convenience market with gas station	Expected buildout under the Orcutt Community Plan

No.	Project Name	Location (APN)	Description	Project Status

[1] Source: County of Santa Barbara Planning and Development Department, Cumulative Project List for the North County (May 22, 2019).
[2] Source: City of Santa Maria, Major Developments (January 2019). https://www.cityofsantamaria.org/city-government/departments/community-development/planning-division/planning-policies-and-regulations/current-development-activity
[3] Source: Santa Maria Joint Union High School District, Final Mitigated Negative Declaration for the Agricultural Education and Career Technical Center (June 2015).
[4] Source: Estimate based on reasonably foreseeable future development of allowable uses identified on Key Site 33 in the Orcutt Community Plan.

4.0 POTENTIALLY SIGNIFICANT EFFECTS CHECKLIST

The following checklist indicates the potential level of impact and is defined as follows:

Potentially Significant Impact: A fair argument can be made, based on the substantial evidence in the file, that an effect may be significant.

Less Than Significant Impact with Mitigation: Incorporation of mitigation measures has reduced an effect from a Potentially Significant Impact to a Less Than Significant Impact.

Less Than Significant Impact: An impact is considered adverse but does not trigger a significance threshold.

No Impact: There is adequate support that the referenced information sources show that the impact simply does not apply to the subject project.

Reviewed Under Previous Document: The analysis contained in a previously adopted/certified environmental document addresses this issue adequately for use in the current case and is summarized in the discussion below. The discussion should include reference to the previous documents, a citation of the page(s) where the information is found, and identification of mitigation measures incorporated from the previous documents.

4.1 AESTHETICS/VISUAL RESOURCES

Will the proposal result in:	Poten. Signif.	Less than Signif. with Mitigation	Less Than Signif.	No Impact	Reviewed Under Previous Document
a. The obstruction of any scenic vista or view open to the public or the creation of an aesthetically offensive site open to public view?				✓	
b. Change to the visual character of an area?			✓		
c. Glare or night lighting which may affect adjoining areas?			✓		
d. Visually incompatible structures?				✓	

Existing Setting:

The study area is located in an area designated as having "moderate" scenic value by the Open Space Element of the Santa Barbara County Comprehensive Plan (2009). No officially designated State or local scenic highways exist near the study area; however, the portion of U.S. Highway 101 adjacent to the study area is labeled as a "State Masterplanned Scenic Highway (Eligible for Designation)" in the County's Scenic Highways Element (Caltrans 2017; County of Santa Barbara 2009). Public views of the study area are limited to motorists on U.S. Highway 101, Union Valley Parkway, and Rodeo Drive. Southbound travelers on U.S. Highway 101 have limited views of the study area because the berm and low wall along the highway median and intervening topography east of the highway largely obstruct southbound travelers' views. Northbound travelers on U.S. Highway 101 and eastbound travelers on Union Valley Parkway have foreground views of low-lying vegetation and scattered trees, including coast live oak (*Quercus agrifolia*), Monterey cypress (*Hesperocyparis macrocarpa*), Deodar cedar (*Cedrus deodara*), blue gum eucalyptus (*Eucalyptus globulus*), Peruvian pepper (*Schinus molle*), Brazilian pepper (*Schinus terebinthifolius*), and blue jacaranda (*Jacaranda mimosifolia*), and distant views of agricultural land and the Sierra Madre Mountains. Travelers on Rodeo Drive have foreground views of low-lying vegetation; paved roadways, including U.S. Highway 101, Santa Maria Way, and Union Valley Parkway; metal fencing; scattered trees; and distant views of agricultural land and the Casmalia Hills (a mountain range to the east of the study area).

County Environmental Thresholds:

The Visual Aesthetics Impact Guidelines in the County Environmental Thresholds and Guidelines Manual (County Environmental Thresholds) (County of Santa Barbara 2018a) classify coastal and mountainous areas, the urban fringe, and travel corridors as "especially important" visual resources. A project may have the potential to create a significantly adverse aesthetic impact if (among other potential effects) it would impact important visual resources, obstruct public views, remove significant amounts of vegetation, substantially alter the natural character of the landscape, or involve extensive grading visible from public areas. The County Environmental Thresholds address public, not private views.

Impact Discussion:

a. **No impact.** The proposed project would result in a future local road connection near an existing highway interchange that would be constructed primarily at grade level and of similar materials (asphalt) as the existing roadways that it would connect. The proposed project would not include berms, retaining walls, sound walls, or any other features that would obstruct scenic views of the Sierra Madre Mountains, Casmalia Hills, or the urban fringe. Views of the urban fringe east of the study area and distant mountains west and east of the study area would still be available for motorists traveling along U.S. Highway 101, Union Valley Parkway, Santa Maria Way, and Rodeo Drive.

Therefore, the proposed project would have no impacts to scenic views or create an aesthetically offensive site open to public view.

b. **Less than significant.** The proposed project would introduce future paved surfaces at grade level on currently undeveloped land. The amount of new paved surfaces would be incremental compared to the field of view and would be similar to the existing visual character along this segment of the U.S. Highway 101 corridor. In addition, grading would be minor and would be designed to blend with the existing topography. The project would not include berms or other new topographic features, and upon completion, the portion of the study area impacted by the project would be revegetated. As a result, the proposed project would not substantially change the visual character or visual setting for motorists traveling along roadways in the project area.

   The initial vegetation removal and heavy equipment activity during the construction period may result in short-term degradation of the visual quality (associated with exposed soil, stockpiles, construction materials and equipment, etc.) of views from U.S. Highway 101, Union Valley Parkway, Santa Maria Way, and Rodeo Drive. Due to the relatively small size of the area to be affected and the temporary nature of construction activities, this impact would be less than significant.

c. **Less than significant.** The proposed project may result in installation of new lighting fixtures along the future local road connection between the Union Valley Parkway/U.S. Highway 101 interchange and Rodeo Drive. In addition, project-related construction activities may require occasional night lighting. Project-related lighting would be located close to the roadway and directed downward toward the roadway. The nearest residences are located approximately 200 feet to the west, across U.S. Highway 101 and would not be affected by lighting during construction or operation of the proposed project due to distance, intervening topography, and ambient nighttime lighting already present in the study area. Potential nighttime lighting impacts would be less than significant.

   Construction and operation of the proposed project would not introduce any glare-creating features. Therefore, no glare-related impacts would occur.

d. **No impact.** The future local road connection under the proposed project would supplement the existing roadway network in the vicinity of the study area and would be visually compatible with existing infrastructure along this segment of the U.S. Highway 101 corridor. No impact would occur.

Cumulative Impacts:

Implementation of the proposed project would not result in any substantial change in the visual character of the area because any future roadway connections or improvements under the proposed project would be visually compatible with its surroundings and would be typical of infrastructure along this segment of the U.S. Highway 101 corridor. Thus, the project would not contribute to any cumulatively considerable effects to aesthetics.

Mitigation and Residual Impact:

No significant impacts were identified; therefore, mitigation is not required.

4.2 AGRICULTURAL RESOURCES

Will the proposal result in:	Poten. Signif.	Less than Signif. with Mitigation	Less Than Signif.	No Impact	Reviewed Under Previous Document
a. Convert prime agricultural land to non-agricultural use, impair agricultural land productivity (whether prime or non-prime) or conflict with agricultural preserve programs?			✓		
b. An effect upon any unique or other farmland of State or Local Importance?			✓		

Existing Setting:

Agricultural lands play a critical economic and environmental role in Santa Barbara County. Agriculture continues to be Santa Barbara County's major producing industry with a gross production value of over $1.5 billion (County of Santa Barbara 2019a). Furthermore, domestic livestock graze 39 percent of the rangelands in Santa Barbara County, which provides the basis for the county's multi-million-dollar livestock industry (Shapero 2019). In addition to the creation of food, jobs, and economic value, farmland provides valuable open space and maintains the county's rural character.

Several thousand acres of agricultural lands dominate the setting north, south, and east of the study area. Agricultural operations in this setting generally range from 20 to more than 600 acres in size. Most operations include irrigated crops, such as blueberries, strawberries, blackberries, peas, squash, zucchini, tomatillos, beans, and flowers (County of Santa Barbara 2014). Residential subdivisions, apartment complexes, schools, and other high-density urban land uses exist in the setting west of the study area and U.S. Highway 101.

The proposed project would impact portions of five parcels that are zoned Agriculture II (AG-II), which include APNs 107-240-005, 107-240-008, 107-240-027, 107-240-043, and 107-240-044. Three of these parcels are used or suitable for agriculture. The County Planning and Development Department maintains aerial imagery that shows APN 107-240-008 (40 acres) has supported field crops and other intensive agriculture since 2006. During a site visit on December 3, 2019, Rincon observed that this parcel supported blackberries within hoop structures. APNs 107-240-027 (10 acres) and 107-240-044 (13 acres) are currently vacant and undeveloped with structures. However, these parcels include underground utilities within Morningside Drive, water wells, test wells, a private shared water system, and a 30,000-gallon underground cistern. These parcels include the same or similar soils as APN 107-240-008 and other nearby parcels that support intensive agriculture (United States Department of Agriculture [USDA] 2019).

Past or present landowners developed the remaining two parcels for non-agricultural uses; therefore, these parcels are no longer used or suitable for agriculture. APN 107-240-005 (27.5 acres) is part of the Elks Unocal Event Center. The parcel includes a BMX track, parking lots, accessory structures, access roads, and other related uses. APN 107-240-043 (1.45 acres) is a long (approximately 750 feet in length) and narrow (approximately 50 feet in width) parcel located between Morningside Drive (a private, gated, access road) to the north and the Caltrans right-of-way to the south. This parcel includes a paved access road that extends 800 feet east from the terminus of Rodeo Drive and 800 feet south to several agricultural parcels.

County Environmental Thresholds:

The County's Agricultural Resource Guidelines (County of Santa Barbara 2018a) provides a methodology for evaluating agricultural resources. These guidelines utilize a weighted point system to serve as a preliminary screening tool for determining significance. The tool helps planners determine whether a proposed subdivision would divide a viable agricultural parcel into two or more parcels that are no longer viable for agricultural production. A project that would result in the loss or impairment of agricultural resources could create a potentially significant impact. The point system measures the productive ability of an existing parcel as compared to proposed parcels. The tool compares availability of resources and prevalent uses that benefit agricultural potential but does not quantifiably measure a parcel's actual agricultural production.

Initial Studies use this weighted point system in conjunction with any additional information regarding agricultural resources. The Initial Study assigns values to nine particular characteristics of agricultural productivity of a project site. These factors include parcel size, soil classification, water availability, agricultural suitability, existing and historic land use, comprehensive plan designation, adjacent land uses, agricultural preserve potential, and combined farming operations. If the tabulated points total 60 or more, the parcel is considered agriculturally viable. A project would be considered to have a potentially significant impact on agricultural resources if a division of land or other development would result in parcels that do not score over 60 points themselves or score substantially lower than the parcel under existing conditions. Any loss or impairment of agricultural resources identified using the point system could constitute a potentially significant impact and warrants additional site-specific analysis.

Impact Discussion:

As discussed under *Existing Setting*, the proposed project would affect portions of five parcels. Past and present landowners developed APNs 107-240-005 and 107-240-043 for non-agricultural uses and, as a result, these parcels are no longer used or suitable for agriculture. Construction of the proposed project on these two parcels would not convert agricultural land to non-agricultural use, impair agricultural land productivity, or otherwise result in significant impacts to agricultural resources. Therefore, the following analysis excludes APNs 107-240-005 and 107-240-043.

APN 107-240-008 currently supports irrigated agriculture, and APNs 107-240-027 and 107-240-044 are suitable for agriculture. Construction of the proposed project would preclude portions of these three parcels from future agricultural use. Therefore, the following analysis of agricultural resources is limited to APNs 107-240-008, 107-240-027, and 107-240-044.

a. **Less than significant.** The following subsections discuss the potential impacts associated with the conversion of agricultural land to non-agricultural use.

   Agricultural Land Productivity – Weighted Point System. Table 3 lists the points assigned to each of the nine characteristics of agricultural productivity for APNs 107-240-008, 107-240-027, and 107-240-044. The subsections following Table 3 summarize the key factors that justify the points assigned to each parcel.

   Parcel Size. Table 4 lists the size of APNs 107-240-008, 107-240-027, and 107-240-044, which range from 10 to 40 acres.

   Soil Classification. The USDA classified the soils on APNs 107-240-008, 107-240-027, and 107-240-044 as Class 4 when irrigated and Class 6 when not irrigated (USDA 2019).

   Water Availability. According to the County Public Health Department, APN 107-240-008 has a permitted water well (Johnston 2019). This well has provided an adequate water supply for irrigated agriculture for more than 14 years. APNs 107-240-044 and 107-240-027 also have~~s~~ a water well and private shared water system that could provide water for irrigated agriculture. ~~APN 107-240-027 does not have a known or permitted water well. However, to provide a conservative estimate of project impacts, this analysis assumes that a new on-site water well or an existing off-site water well on APN 107-240-008, APN 107-240-044, and/or another adjacent parcel could provide an adequate water supply for APN 107-240-027.~~

Table 3 Agricultural Suitability and Productivity Analysis

	APN 107-240-008		APN 107-240-027	APN 107-240-044
Agricultural Suitability and Productivity	**Existing/Pre-Project**	**Future/Post-Project[1]**	**Existing/Pre-Project**	**Existing/Pre-Project**
Parcel size • Less than 5 acres 0-3 • 5-10 acres 4-6 • 10-40 acres 7-8	8	8	6	7
Soil classification • Class I 14-15 • Class II 11-13 • Class III 8-10 • Class IV 6-7 • Class VI or VII 1-5	7	7	7	7
Water availability • Adequate supply 12-15 • May be marginal 8-11 • Potentially available 3-7 • Does not have developed water, sources of poor quality/quantity 0-2	15	15	12	12~~0~~
Agricultural Suitability *Crops* • Highly suitable for irrigated crops 8-10 • Highly suitable for irrigated ornamentals, pasture, dry farming 6-8 • Moderate suitable for irrigated crops 4-5 • Low suitability for any crops 1-3 *Rangeland* • Highly suitable for pasture or range 6-10 • Moderately suitable for pasture or range 3-5 • Low suitability for pasture or range 1-2	10	10	5	5

Agricultural Suitability and Productivity	APN 107-240-008 Existing/Pre-Project	APN 107-240-008 Future/Post-Project[1]	APN 107-240-027 Existing/Pre-Project	APN 107-240-044 Existing/Pre-Project
Existing and Historic Land Use • Active agricultural production 5 • Maintained range 5 • Unmaintained, productive within last 10 years 3-5 • Vacant land: fallow or never planted with range of suitabilities of agricultural potential 1-3 • Substantial urban or agricultural industrial development on-site 0	5	5	3	3
Comprehensive Plan Designation • A-II 5 • Commercial, Industrial, Community Facility 0	5	5	5	5
Adjacent Land Uses • Surrounded by agricultural operations with adequate support uses 9-10 • Surrounded by agricultural operations without adequate support uses 7-8 • Partially surrounded by agriculture/open space with some urban uses adjacent, in a region with agricultural support uses 7-8	9	9	7	7
Agricultural Preserve Potential • Can qualify for prime agricultural preserve by itself, or is in a preserve 5-7 • Can qualify for non-prime agricultural preserve by itself 2-4 • Can qualify for prime agricultural preserve with adjacent parcels 3-4 • Can qualify for non-prime agricultural preserve with adjacent parcels 1-3 • Cannot qualify 0	7	4	0	0

Agricultural Suitability and Productivity	APN 107-240-008		APN 107-240-027	APN 107-240-044
	Existing/Pre-Project	**Future/Post-Project[1]**	**Existing/Pre-Project**	**Existing/Pre-Project**
Combined Farming Operations • Provides a significant component of a combined farming operation 5 • Provides an important component of a combined farming operation 3 • Provides a small component of a combined farming operation 1 • No combined operation 0	5	5	0	0
TOTAL	71	68	45	46~~4~~
[1] This table includes only existing/pre-project scores for APNs 107-240-027 and 107-240-044. It does not include future/post-project scores for these two parcels because both scored less than 60 points under existing/pre-project conditions, thus showing that the parcel is not considered agriculturally viable, and no potentially significant impact to agricultural resources on APNs 107-240-027 and 107-240-044 would occur.				

Table 4 Study Area Parcel Sizes

APN	Owner	Current Use	Parcel Size (acres)	Potentially Impacted Area (acres)
107-240-008	Staben, Jeanne L. Trust ~~Mendez, Kevin~~	Agricultural operations (e.g., berry production)	40.00	3.60
107-240-027	Jimmie L. and ~~Jantz,~~ Atha A. Jantz Family Trust	Undeveloped	10.00	1.80
107-240-044	Jimmie L. and ~~Jantz,~~ Atha A. Jantz Family Trust	Undeveloped	13.11	7.70

Agricultural and Rangeland Suitability. The Conservation Element of the County Comprehensive Plan (map titled "Santa Barbra County Agricultural Suitability for Major Crops") classifies APNs 107-240-008, 107-240-027, and 107-240-044 as "suitable only for certain crops" (County of Santa Barbara 2010). However, the County produced the map over 40 years ago. To reflect current conditions, County staff classified APN 107-240-008 (moderate size [40 acres], currently irrigated, produces high-value crops) as "highly suitable for irrigated crops" and APNs 107-240-027 and 107-240-044 (relatively small [10 and 13 acres, respectively], fallow) as "moderately suitable for irrigated crops."

Existing and Historic Land Use. APN 107-240-008 has supported field crops and other intensive agriculture since 2006. The parcel supported blackberry production in December 2019. APNs 107-240-027 and 107-240-044 are undeveloped lands. However, the parcels have soils that are suitable for agriculture. County staff classified these two parcels as vacant/fallow agricultural lands.

Comprehensive Plan Designation. The County Comprehensive Plan designates APNs 107-240-008, 107-240-027, and 107-240-044 as Agriculture II (A-II).

Adjacent Land Uses. APN 107-240-008 adjoins active agricultural lands to the east and south, the Elks Unocal Event Center to the north, and fallow agricultural lands to the west.

APN 107-240-027 adjoins the Elks Unocal Event Center to the north and west; Morningside Drive (a gated, private road), a paved access road, and a stormwater detention basin to the south; and fallow agricultural lands to the east.

APN 107-240-044 adjoins active agricultural lands to the east and south, the Elks Unocal Event Center to the north, and fallow agricultural lands to the west.

Thousands of acres of high-value irrigated agricultural lands exist north, south, and east of APNs 107-240-008, 107-240-027, and 107-240-044. The project area also includes a produce cooling plant (APN 129-010-035) and other agricultural processing uses and structures. As a result, agricultural operations and adequate support uses surround APNs 107-240-008, 107-240-027, and 107-240-044 (Trupe 2019).

Agricultural Preserve Potential. The Santa Barbara County Uniform Rules for Agricultural Preserves and Farmland Security Zones (Uniform Rules) (County of Santa Barbara 2018b) state that parcels may qualify for an agricultural preserve contract if the parcels satisfy the following requirements:

- Comprehensive Plan designation of Agricultural Commercial, Agriculture I, Agriculture II, or Mountainous Area;

- Zoning designation of Agriculture, Mountainous, or Resource Management;
- Minimum parcel size of 40 acres for prime or superprime land and 100 acres for nonprime land; and
- Land is and will be used principally for the active production of commercial agricultural products (grazing and/or cultivated agriculture) and has a secure water source to support the agricultural activity.

APNs 107-240-027 and 107-240-044 are approximately 10 and 13 acres in size, respectively. As a result, these parcels are too small in size to qualify for the County Agricultural Preserve Program.

APN 107-240-008 is 40 acres in size. It is designated Agriculture II (A-II) in the County Comprehensive Plan and zoned Agriculture II (AG-II) in the County Land Use and Development Code. APN 107-240-008 includes an on-site water well and is used for irrigated commercial agriculture. Based on these factors, APN 107-240-008 can currently (i.e., under existing/pre-project conditions) qualify by itself for a prime land agricultural preserve contract.

The project proponent would need to acquire approximately one acre of APN 107-240-008 to construct the proposed project. This acquisition would reduce the size of APN 107-240-008 below the 40-acre minimum parcel size requirement for a prime land agricultural preserve contract. However, the Uniform Rules allow several exceptions to the 40-acre minimum size requirement. For example, the County Board of Supervisors may reduce this requirement to 30 acres (Uniform Rules Subsection 1-2.2.C.4) subject to four findings. Landowners with less than 40 acres may create a single or multiple contract preserve(s) of 40 acres or more with two or more adjacent parcels (Uniform Rules Subsection 1-2.2.C.2). County staff's preliminary analysis shows that APN 107-240-008 could qualify for a prime land agricultural preserve contract by itself or with adjacent parcels to the south (APN 107-240-037; 39 acres), southeast (APN 129-120-001; 327 acres), or east (APN 129-010-012; 634 acres) after acquisition and construction of the proposed project. To analyze the worst-case scenario, the Agricultural Preserve Potential rating in Table 3 assumes APN 107-240-008 would only qualify for a prime land agricultural preserve contract with one or more adjacent parcels.

Combined Farming Operations. Reiter Berry Farm currently farms the southern half of APN 107-240-008 as part of a combined farming operation with adjacent agricultural lands to the south (APNs 107-300-037, 107-300-007, and 129-120-001) (Trupe 2019).

APNs 107-240-027 and 107-240-044 are under the same ownership, but are not currently under agricultural production. Therefore, they are not currently part of a combined farming operation.

Overall Rating. Projects that affect parcels scoring 60 or more points may have a potentially significant impact on agricultural resources. As shown in Table 3, APNs 107-240-027 and 107-240-044 scored 45 and 44 points, respectively.[1] Therefore, APNs 107-240-027 and 107-240-044 have relatively low agricultural suitability and productivity, and constructing the proposed project on portions of these parcels would have a less than significant impact on agricultural land productivity and agricultural resources.

As shown in Table 3, APN 107-240-008 scored 71 points under existing/pre-project conditions and 68 points under future/post-project conditions. The minor difference in scoring between existing/pre-project conditions and future/project-project conditions reflects the fact that the proposed project would only affect approximately one acre of the southwest corner of APN 107-240-008 (see Attachment 1). Furthermore, only approximately 0.07 acre, or 3,050 square feet, of this one acre is suitable and used for agriculture. The remainder is not suitable or used for agriculture because it includes west- and south-facing slopes with lower-quality soils. (See the analysis under item (b) below for more information on soils.) The remaining 39 acres of APN 107-240-008 would be of sufficient size and

[1] Table 3 includes existing/pre-project scores for APNs 107-240-027 and 107-240-044. Table 3 does not include future/post-project scores because both parcels scored less than 60 points under existing/pre-project conditions.

capability to continue supporting the existing agricultural enterprise independent of any other parcel. In addition, the proposed project would not introduce incompatible land uses, such as residences or schools, which could impair agriculture and result in the indirect loss of agricultural lands. Therefore, constructing the proposed project on a small portion of APN 107-240-008 would have a less-than-significant impact on agricultural land productivity and agricultural resources.

Prime Agricultural Land [2]

The USDA Natural Resources Conservation Service uses land capability classifications to show the suitability of soils for field crops. The classification groups soils in the following three levels: capability class, subclass, and unit. Capability classes, the broadest group, range from Class 1 through Class 8. The numbers indicate progressively greater limitations and narrower choices for agricultural use. For example, Class 1 soils have few limitations that restrict their use. Class 8 soils have limitations that preclude commercial plant production. The County Environmental Thresholds (County of Santa Barbara 2018a) states, "Classes I [1] and II [2] are considered to be prime agricultural soils because they impose few limitations on agricultural production, and almost all crops can be grown successfully on these soils."

The USDA classified the soils on APNs 107-240-008, 107-240-027, and 107-240-044 as Class 4 irrigated and Class 6 non-irrigated (USDA 2019). Therefore, these soils do not qualify as prime agricultural soils, and the proposed project would not impact prime agricultural soils.

Agricultural Preserve Program

APNs 107-240-008, 107-240-027, and 107-240-044 are not enrolled in the County Agricultural Preserve Program (Santa Barbara County Assessor's Office 2020). Therefore, the proposed project would not conflict with the County Agricultural Preserve Program.

In summary, the proposed project would not convert prime agricultural soil to non-agricultural use, impair agricultural land productivity, or conflict with agricultural preserve programs. Therefore, the project would have less than significant impacts on agricultural resources.

b. **Less than significant.** The California Department of Conservation's (CDC) Farmland Mapping and Monitoring Program (FMMP) rates and maps (Important Farmland Maps) agricultural lands according to soil quality and irrigation status. For environmental review under CEQA, the FMMP classifies agricultural lands into the following five categories: Prime Farmland, Farmland of Statewide Importance, Unique Farmland, Farmland of Local Importance, and Grazing Land. Prime Farmland has the best physical and chemical features for agriculture. Farmland of Statewide Importance is similar to Prime Farmland but has greater slopes or other minor shortcomings and only includes irrigated lands. Unique Farmland has lesser quality soils used for the state's leading crops and may include non-irrigated lands. Farmland of Local Importance is land of importance to the local agricultural economy as determined by each county. Grazing Land has vegetation suitable for the grazing of livestock. The FMMP periodically updates the Important Farmland Maps, which were last updated in the study area in 2016.

The proposed project would traverse the southern edge of APN 107-240-027 and the central portion of APN 107-240-044. The FMMP classified these two parcels as Grazing Land (CDC 2016). Aerial imagery maintained by the County Planning and Development Department shows that APNs 107-240-027 and 107-240-044 have remained fallow since at least the 1940s.

The proposed project would also traverse the central portion of the western edge of APN 107-240-008. The FMMP generally classified this portion of APN 107-240-008 as Grazing Land and classified

[2] The County Environmental Thresholds (County of Santa Barbara 2018a) uses the terms "prime agricultural soils" and "prime agricultural land." The County Environmental Thresholds define "prime agricultural soils" as soils that the USDA has classified as Class 1 or Class 2. The County Environmental Thresholds do not define "prime agricultural land." Therefore, the impact discussion under item (a) evaluates the project's potential impacts on prime agricultural soils.

the remainder of APN 107-240-008 as Farmland of Statewide Importance (CDC 2016). Except for an approximately 80-foot segment (approximately 0.07 acre, or 3,050 square feet) on APN 107-240-008, all of the proposed project would be located on Grazing Land. These lands include lower quality soils that the landowners/lessee have not used for crop production. The remaining 80-foot segment of the proposed project would be located on Farmland of Statewide Importance. This land has supported irrigated agriculture and produced blackberries and other crops for more than a decade. However, it is a very small portion of the existing agricultural operation on APN 107-240-008. Converting this land to non-agricultural use would have little or no effect on agricultural production or viability, and the remainder of APN 107-240-008 would remain in crop production. Therefore, the project would have a less-than-significant impact on important farmland, such as Prime Farmland and Farmland of Statewide Importance.

Cumulative Impacts:

The County's environmental thresholds, in part, define the point at which a project's contribution to a regionally significant issue constitutes a significant effect at the project level. As discussed above, the proposed project would not exceed the thresholds of significance for agricultural resources. Therefore, the project's contribution to the regionally significant loss of agricultural resources would not be considerable, and the cumulative effect on regional agriculture would be less than significant.

Mitigation and Residual Impact:

No significant impacts were identified; therefore, mitigation is not required.

4.3a AIR QUALITY

Will the proposal result in:	Poten. Signif.	Less than Signif. with Mitigation	Less Than Signif.	No Impact	Reviewed Under Previous Document
a. The violation of any ambient air quality standard, a substantial contribution to an existing or projected air quality violation, or exposure of sensitive receptors to substantial pollutant concentrations (emissions from direct, indirect, mobile and stationary sources)?		✓			
b. The creation of objectionable smoke, ash or odors?				✓	
c. Extensive dust generation?		✓			

Existing Setting:

The project site is located in Santa Barbara County within the South Central Coast Air Basin (SCCAB), which encompasses San Luis Obispo, Santa Barbara, and Ventura counties. The Santa Barbara County portion of the SCCAB is under the jurisdiction of the Santa Barbara County Air Pollution Control District (SBCAPCD), which is the agency responsible for enforcing standards and regulating stationary sources. Santa Barbara County fails to meet certain state air quality standards and has been designated nonattainment-transitional for the state 8-hour and 1-hour ozone standards and nonattainment for the state standard for particulate matter with a diameter of 10 micrometers or less (PM_{10}).[3] Santa Barbara County is designated as in attainment or unclassifiable for all other federal and state ambient air quality standards (SBCAPCD 2019).

The 2016 Ozone Plan is the current SBCAPCD Board-adopted air quality management plan for the County. The 2016 Ozone Plan incorporates and builds upon the prior Clean Air Plans and predominantly focuses on achieving attainment of the state ozone standards, in addition to the federal ozone standard. The 2016 Ozone Plan focuses on reducing ozone precursor emissions through implementation of transportation control measures that serve to reduce mobile source emissions, which are the primary source of reactive organic compounds (ROC) and nitrogen oxides (NO_X) emissions in the County (SBCAPCD 2016).

The study area contains several roadways as well as agricultural and recreational land uses. Therefore, air pollutant emissions within the study area are generated primarily by mobile sources (i.e., vehicles) as well as dust-generating activities associated with agricultural operations and open-air events at the Elks Unocal Event Center, such as rodeos and BMX bicycle races. Mobile source emissions increase during large events at the Elks Unocal Event Center because of increased traffic that often results in heavy traffic congestion and idling along Rodeo Drive, Santa Maria Way, and the northbound Santa Maria Way/U.S. Highway 101 off-ramp.

Some land uses are considered more sensitive to changes in air quality than others, depending on the population groups and the activities involved. The California Air Resources Board (CARB) has identified the following typical groups who are most likely to be affected by air pollution: children under 14 years of age; elderly over 65 years of age; athletes; and people with cardiovascular and chronic respiratory diseases. Land uses typically associated with sensitive receptors include schools, parks, playgrounds, childcare centers, retirement homes, convalescent homes, hospitals, and clinics (CARB 2005). The sensitive receptors nearest to the location of the proposed project include single-family and multi-family residential land uses located approximately 400 feet to the west, and The Children's House Montessori School located approximately 440 feet to the west. All existing sensitive land uses in the immediate area are located west of U.S. Highway 101. However, the SMJUHSD Agricultural Education and Career

[3] A region is designated nonattainment-transitional for ozone when the standard has not been exceeded on more than three days at any one location during the last year.

Technical Center, to be located approximately 710 feet east of the study area, is currently under construction immediately east of the study area and is therefore a future sensitive receptor because it will likely be occupied at the time of project construction.

County Environmental Thresholds:

Chapter 5 of the County Environmental Thresholds (2018a) address air quality. Based on the County Environmental Thresholds, air quality impacts would be considered significant if the project:

- Interferes with progress toward the attainment of the ozone standard by releasing emissions which equal or exceed the established long-term quantitative thresholds for NO_X and ROC; or
- Generates emissions that result in ambient air quality conditions that equal or exceed the state or federal ambient air quality standards for any criteria pollutant (as determined by modeling).

The County Environmental Thresholds (2018a) and the SBCAPCD do not provide thresholds for short-term construction emissions. However, SBCAPCD recommends quantification of construction-related emissions from construction activities and uses 55 ~~25~~ tons per year for ROC and NO_X as a guideline for determining the significance of construction impacts. In addition, under SBCAPCD Rule 202.D.16~~F.3~~, if the combined emissions from all construction equipment used to construct a stationary source which requires an Authority to Construct have the potential to exceed 25 tons of any pollutant, except carbon monoxide (CO), in a 12-month period, the owner of the stationary source shall provide offsets under the provisions of Rule 804 and shall demonstrate that no ambient air quality standard would be violated. Therefore, this analysis uses 55 ~~25~~ tons per year as a significance threshold for construction-related emissions of ROC, NO_X, sulfur dioxide (SO_2), PM_{10}, and particulate matter with a diameter of 2.5 micrometers or less ($PM_{2.5}$).

The County's Grading Ordinance (Santa Barbara County Code, Chapter 14) requires standard dust control conditions for most projects. In addition, the County Environmental Thresholds (2018a) require implementation of dust mitigation measures for all discretionary construction activities that involve earth-moving activities regardless of project size or duration because the Santa Barbara County region is designated nonattainment for the state PM_{10} standard.

The County Environmental Thresholds provide operational emission thresholds, which state that operational air quality impacts would be considered significant if the project:

- Emits (from all project sources, mobile and stationary) more than the daily triggers for offsets of any pollutant under the SBCAPD New Source Review Rule (Rule 802), which are currently 150 pounds per day (lbs/day) for CO and 240 lbs/day for attainment pollutants and precursors (i.e., SO_2). Rule 802 does not specify daily triggers for offsets of NO_X, ROC, PM_{10}, or $PM_{2.5}$. Therefore, the daily triggers for best available control technology under Rule 802 are utilized in this analysis. These triggers are 120 lbs/day for ROC and NO_X, 80 lbs/day for PM_{10}, and 55 lbs/day for $PM_{2.5}$.
- Emits 25 lbs/day or more of NO_X or ROC from motor vehicle trips only;
- Causes or contributes to a violation of a California or National Ambient Air Quality Standard (except ozone);
- Exceeds the SBCAPCD's health risk public notification thresholds adopted by the SBCAPCD board; or
- Is inconsistent with the adopted federal and State Air Quality Plans.

The County Environmental Thresholds also state that a project will have a significant air quality impact if it causes a CO "hotspot" by adding emissions to existing background CO levels that exceed the California one-hour standard of 20 parts per million, which typically occurs at severely congested intersections. The County provides the following screening criteria for CO impacts:

- If a project contributes less than 800 peak hour trips, then CO modeling is not required.

- Projects contributing more than 800 peak hour trips to an existing congested intersection at level of service (LOS) D or below, or that will cause an intersection to reach LOS D or below, may be required to model for CO impacts. However, projects that will incorporate intersection modifications to ease traffic congestion are not required to perform modeling to determine potential CO impacts.

The County Environmental Thresholds recommend discussing the following issues if they are applicable to the project:

- Emissions which may affect sensitive receptors (e.g., children, elderly, or acutely ill);
- Toxic or hazardous air pollutants in amounts which may increase cancer risk for the affected population; or
- Odor or other air quality nuisance problems impacting a considerable number of people.

For cumulative impacts, the County Environmental Thresholds state that a project's contribution to the cumulative air quality impact of the region's nonattainment-transitional designation for ozone would be cumulatively considerable if a project's total emissions of ozone precursors (NO_X or ROC) would exceed the County's operational threshold of 120 lbs/day. For projects that do not have significant ozone precursor emissions or localized pollutant impacts, emissions have been taken into account in the 2016 Ozone Plan growth projections; therefore, these projects would not have a cumulatively considerable contribution to the cumulative air quality impact.

Impact Discussion:

a, c. **Less than significant with mitigation.** The following subsections discuss air pollutant emissions generated by project construction and operation.

Short-term Construction Emissions:

Project construction would involve site preparation, grading, paving, and architectural coating, which would temporarily generate air pollutant emissions. Project construction activity would emit ozone precursors NO_X and ROC, as well as CO, SO_2, PM_{10}, and $PM_{2.5}$. The majority of construction-related emissions would result from grading due to the use of heavy-duty construction equipment and fugitive dust generation. Other emissions would result from paving and the evaporation of ROC from architectural coatings (paint). Construction emissions were modeled using the California Emissions Estimator Model (CalEEMod) version 2016.3.2. It was assumed that project construction would occur over the course of nine months, beginning July 2020,[4] and the construction equipment mix was based on CalEEMod default values for the SBCAPCD region. The project would require export of approximately 42,000 cubic yards of soil, which would require approximately 5,250 one-way haul truck trips over approximately five months, which equates to approximately 52 one-way truck trips per day or approximately 6 one-way truck trips per hour during the grading phase. Project construction would be required to comply with SBCAPCD Rule 323, which specifies a volatile organic content limit of 150 grams per liter for traffic marking coatings.

Table 5 summarizes estimated annual construction emissions for the proposed project. As shown therein, project construction would generate approximately 0.3 ton per year of ROC emissions, 3.8 tons per year of NO_X emissions, and 0.5 ton per year of PM_{10} emissions. Construction emissions would not exceed the County's threshold of 25 tons per year for ROC, NO_X, SO_2, PM_{10}, and $PM_{2.5}$. Furthermore, the County of Santa Barbara considers short-term construction emissions of NO_X to be less than significant because countywide emissions of NO_X from

[4] It is unknown at this time when project construction will begin. However, the assumption that construction will commence in July 2020 is a conservative assumption because construction equipment is anticipated to become more efficient and generate fewer air pollutant emissions over time. Therefore, assuming the use of the least-efficient equipment possible results in reasonable worst-case construction emissions.

construction equipment is insignificant compared to regional NO_X emissions from other sources, such as vehicles (County of Santa Barbara 2018a).

Table 5 Anticipated Proposed Project Construction Emissions

	Maximum Annual Emissions (tons/year)					
	ROC	**NO_X**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**
Maximum Annual Construction Emissions	0.3	3.8	1.9	< 0.1	0.5	0.3
County Threshold	55~~25~~	55~~25~~	n/a	25	80~~25~~	25
Threshold Exceeded?	**No**	**No**	**No**	**No**	**No**	**No**

Notes: All emissions modeling was completed using CalEEMod. See Attachment 2 for modeling results. Some numbers may not sum exactly due to rounding. Emission data shown is from "mitigated" results, which account for compliance with regulations and project design features.

Project construction activities would be subject to the County's grading ordinance to minimize fugitive dust emissions and associated impacts to air quality. The grading ordinance requires a grading permit and an Erosion and Sediment Control Plan for all new grading, excavations, fills, cuts, borrow pits, stockpiling, compaction of fill, and land reclamation projects on privately owned land where the transported amount of materials exceeds 50 cubic yards or the cut or fill exceeds three feet in vertical distance to the natural contour of the land.[5] The proposed project would require approximately 42,000 cubic yards of export and would therefore be subject to the County's grading ordinance. Because the County violates the state standard for PM_{10}, the County and the SBCAPCD require implementation of standard dust control measures for all discretionary projects based on the policies in the 1979 Air Quality Attainment Plan, which was most recently updated in the 2016 Ozone Plan. Although PM_{10} emissions from project construction activities would not exceed the County's thresholds, the project's impacts related to PM_{10} emissions and extensive dust generation would be potentially significant because the project, as proposed, would not implement the County's and SBCAPCD's dust control measures. With implementation of Mitigation Measure Air-01 (see below), which requires implementation of the County's and SBCAPCD's dust control measures, the potential impacts would be reduced to a less-than-significant level. Therefore, impacts would be less than significant with mitigation.

Long-term Operational Emissions:

Upon completion, the project itself would not generate air pollutant emissions. The purpose of the project is to decrease traffic congestion and improve safety and emergency vehicle access. As such, the project would not directly induce additional vehicular trip generation. Traffic congestion typically results in elevated localized concentrations of ozone and CO generated by vehicles idling in heavy traffic conditions. By decreasing traffic congestion, the project would result in lower localized concentrations of these pollutants and would therefore reduce potential health impacts experienced by sensitive receptors near the U.S. Highway 101/Santa Maria Way interchange (i.e., residences west of U.S. Highway 101). In addition, as discussed in Section 4.14, *Transportation/Circulation*, the proposed project would reduce VMT and associated air pollutant emissions for drivers in the study area traveling from or to areas near or south of Union Valley Parkway or accessing the Elks Unocal Event Center and other parcels east of U.S. Highway 101. With construction of the proposed project, drivers could access Union Valley Parkway or

[5] The County accepts a Stormwater Pollution Prevention Plan (SWPPP) in lieu of an Erosion and Sediment Control Plan, as long as the SWPPP contains the requirements of the County's Erosion and Sediment Control Plan.

southbound U.S. Highway 101 without the need to travel out of their way to the Santa Maria Way interchange. As a result, the project may decrease long-term air pollutant emissions for the region. Furthermore, the project would result in construction of a paved local road connection to serve existing traffic. As such, vehicular traffic along the proposed roadway would not result in extensive dust generation. Therefore, operational air pollutant emission impacts would be less than significant.

b. **No impact.** The proposed project does not include land uses that typically produce objectionable smoke, ash, or odors, such as agricultural uses, wastewater treatment plants, chemical plants, and composting facilities (CARB 2005). Therefore, odor emissions would be limited to emissions associated with typical construction, such as vehicle and engine exhaust. Project construction would not generate smoke or ask emissions. Given that the nearest sensitive receptors are located across U.S. Highway 101 approximately 400 feet to the west of future project construction activities, odors generated by construction activities would not be perceptible at these receptors. As such, no impact would occur.

Cumulative Impacts:

Growth within Santa Barbara County contributes to existing exceedances of the state ozone and PM_{10} ambient air quality standards; therefore, these exceedances represent cumulative air quality impacts. Construction and operation of the project would generate emissions of ozone precursors as well as emissions of PM_{10}. As discussed under items (a) and (c), the project would be required to comply with the County's grading ordinance, and implementation of Mitigation Measure Air-01 would require use of standard dust control measures required by the County of Santa Barbara and SBCAPCD. These measures would reduce PM_{10} emissions during construction. In addition, operational emissions of ozone precursors (NO_X or ROC) and PM_{10} would not exceed the County's annual operational emission threshold because the project would not induce new vehicle trips and would reduce idling emissions from existing vehicular traffic on Santa Maria Way during large events at the Elks Unocal Event Center. Therefore, with implementation of Mitigation Measure Air-01, the contribution of the project to the County's nonattainment status for the state ozone and PM_{10} standards would not be cumulatively considerable.

Mitigation and Residual Impact:

The proposed project could result in a potentially significant impact due to PM_{10} emissions and dust generation during construction activities. With implementation of Mitigation Measure Air-01, the potential impact would be reduced to a less-than-significant level:

MM Air-01 **Dust Control:** In addition to the SBCAPCD's standard fugitive dust control measures, the project proponent shall comply with the following dust control components at all times including weekends and holidays:

- Dust generated by the development activities shall be kept to a minimum with a goal of retaining dust on the site.
- During clearing, grading, earth moving, excavation, or transportation of cut or fill materials, water trucks or sprinkler systems shall be used to prevent dust from leaving the site and to create a crust after each day's activities cease.
- During construction, water trucks or sprinkler systems shall be used to keep all areas of vehicle movement damp enough to prevent dust from leaving the site.
- The construction area shall be wetted down after work is completed for the day and whenever wind exceeds 15 miles per hour.
- When wind exceeds 15 miles per hour, the site shall be watered at least once each day, including weekends and holidays.

- Increased watering shall occur as necessary to prevent transport of dust off-site.
- Soil stockpiled for more than two days shall be covered or treated with soil binders to prevent dust generation. Soil binders shall be reapplied as needed.
- If the site is graded and left undeveloped for over four weeks, the project proponent shall immediately:
  - (i) Seed and water to revegetate graded areas;
  - (ii) Spread soil binders; and/or
  - (iii) Employ any other method(s) deemed appropriate by the County Planning and Development Department or SBCAPCD.

PLAN REQUIREMENTS: These dust control requirements shall be included in the Stormwater Pollution Prevention Plan (SWPPP).

TIMING: The dust monitor shall be designated prior to grading permit issuance. The dust control components shall apply from the beginning of any grading or construction throughout all development activities.

MONITORING: The County shall ensure measures are included on plans. The County shall spot check and ensure compliance on site. SBCAPCD inspectors shall respond to nuisance complaints.

4.3b AIR QUALITY - Greenhouse Gas Emissions

Greenhouse Gas Emissions - Will the proposal:	Poten. Signif.	Less than Signif. with Mitigation	Less Than Signif.	No Impact	Reviewed Under Previous Document
a. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?			✓		
b. Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?				✓	

Existing Setting:

Greenhouse gases (GHGs) include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), and nitrogen trifluoride (NF_3) (California Health and Safety Code, Section 38505[g]). These gases are a primary cause of global climate change. Fossil fuel use, industrial processes, and other human activities have raised GHG emissions above pre-industrial levels (United States Global Change Research Program 2018). As a result, the global mean surface temperature increased by approximately 1.8 degrees Fahrenheit (°F; 1 degree Celsius [°C]) in the past 80 years and is likely to reach a 2.7°F (1.5°C) increase by 2050 at current global GHG emissions rates (Intergovernmental Panel on Climate Change 2018). In unincorporated Santa Barbara County, the transportation sector produces 38 percent of the total non-stationary source GHG emissions. Other sources include building energy use (28 percent), agriculture (14 percent), off-road equipment (11 percent), solid waste (9 percent), and water/wastewater (0.3 percent) (County of Santa Barbara 2018c).

Climate change impacts include more frequent and intense weather and climate-related events that can damage infrastructure, ecosystems, and social systems across the United States (United States Global Change Research Program 2018). California's central coast, including Santa Barbara County, may experience altered precipitation patterns, reduced foggy days, increased extreme heat days, exacerbated drought and wildfire conditions, and accelerated sea level rise leading to increased coastal flooding and erosion (State of California 2018).

Greenhouse Gas Emission Reduction Planning

In 2015, the County adopted the *Energy and Climate Action Plan* (ECAP) (County of Santa Barbara 2015a) and certified the accompanying *Final Environmental Impact Report for the Energy and Climate Action Plan* (EIR) (County of Santa Barbara 2015b). The purpose of the ECAP is to reduce GHG emissions from land use development in the County through selected emission reduction measures. The ECAP sets a GHG reduction target of 15 percent below 2007 (baseline) emissions by 2020, consistent with the State's target established by Assembly Bill 32. It contains goals, policies, and emission reduction measures to achieve this target. In this regard, the ECAP was adopted as the County's "plan to reduce greenhouse gas emissions" in accordance with CEQA Guidelines Section 15183.5.

The County has been implementing the ECAP's emission reduction measures. However, the *2016 Greenhouse Gas Emissions Inventory Update and Forecast* concludes that the County is not projected to meet its 2020 GHG reduction target (County of Santa Barbara 2018c). Therefore, the County can no longer rely on the ECAP's EIR or its emission reduction measures when determining the significance of a project's GHG emissions.

County Environmental Thresholds:

The environmental review process must consider whether a proposed project's GHG emissions may have a significant impact on the environment. CEQA Guidelines Section 15064.4(a) states, "A lead agency should make a good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate or estimate the amount of GHG emissions resulting from a project."

No single project generates sufficient GHG emissions to affect the global climate. Rather, global climate change results from GHG emissions generated from many sources over time (Intergovernmental Panel on Climate Change 2014). According to CEQA Guidelines Section 15064.4(b), "the lead agency should focus its analysis on the … incremental contribution of the project's emissions to the effects of climate change. A project's incremental contribution may be cumulatively considerable even if it appears relatively small compared to statewide, national, or global emissions." Therefore, global climate change is a cumulative impact under CEQA.

Public agencies may use a threshold of significance to determine the significance of cumulative impacts from a project's GHG emissions. CEQA Guidelines Section 15064.4(b) states:

> A lead agency should consider the following factors, among others, when assessing the significance of impacts from greenhouse gas emissions on the environment:
>
> 1. The extent to which the project may increase or reduce greenhouse gas emissions as compared to the existing environmental setting.
> 2. Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project.
> 3. The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions (see, e.g., section 15183.5[b]). Such requirements must be adopted by the relevant public agency through a public review process and must reduce or mitigate the project's incremental contribution of greenhouse gas emissions. If there is substantial evidence that the possible effects of a particular project are still cumulatively considerable notwithstanding compliance with the adopted regulations or requirements, an EIR must be prepared for the project. In determining the significance of impacts, the lead agency may consider a project's consistency with the State's long-term climate goals or strategies, provided that substantial evidence supports the agency's analysis of how those goals or strategies address the project's incremental contribution to climate change and its conclusion that the project's incremental contribution is not cumulatively considerable.

Neither the County nor SBCAPCD have adopted a quantitative threshold of significance for non-industrial sources of GHG emissions. Therefore, this analysis qualitatively evaluates the significance of the project's GHG emissions in light of the checklist questions from Appendix G of the CEQA Guidelines, which are included in the table above, as well as CEQA Guidelines Sections 15064.4(b)(1) and 15064.4(b)(3).

Impact Discussion:

a. **Less than significant.** Temporary project-related GHG emissions would primarily be generated by project construction activities. The majority of construction-related emissions would result from the use of heavy-duty construction equipment. Construction emissions were modeled using the California Emissions Estimator Model (CalEEMod) version 2016.3.2. It was estimated that project construction would occur over the course of nine months, beginning July 2020,[6] and the

[6] It is unknown at this time when project construction would begin. However, the assumption that construction would commence in July 2020 is a conservative assumption because construction equipment is anticipated to become more efficient and generate

construction equipment mix was based on CalEEMod default values for the SBCAPCD region. The project would require export of approximately 42,000 cubic yards of soil, which would require approximately 5,250 haul trucks trips. According to the CalEEMod results, project construction would generate approximately 550 metric tons (MT) of carbon dioxide equivalents (CO_2e) (Attachment 2).

Upon completion, the project itself would not generate GHG emissions. The purpose of the project is to decrease traffic congestion and improve safety and emergency vehicle access. As such, the project would not directly induce additional vehicular trip generation. By decreasing traffic congestion, the project would decrease GHG emissions generated by idling cars, thereby resulting in a beneficial impact. In addition, as discussed in Section 4.14, *Transportation/Circulation*, the proposed project would reduce VMT and associated GHG emissions for drivers in the study area traveling from or to areas near or south of Union Valley Parkway or accessing the Elks Unocal Event Center and other parcels east of U.S. Highway 101. With construction of the proposed project, drivers could access Union Valley Parkway or southbound U.S. Highway 101 without the need to travel out of their way to the Santa Maria Way interchange. As a result, the project may decrease long-term GHG emissions for the region. Because construction-related GHG emissions would be temporary in nature and project operation would result in a net decrease in long-term GHG emissions, the proposed project would not generate GHG emissions that may have a significant impact on the environment, and impacts would be less than significant.

b. **No impact.** The plans, policies, and regulations adopted for the purpose of reducing GHG emissions that are most applicable to the proposed project are the Santa Barbara County ECAP, the SBCAG Regional Transportation Plan/Sustainable Communities Strategy (otherwise known as *Fast Forward 2040*), and the 2017 Scoping Plan. Section 4-7 of the County's ECAP contains several measures directed at reducing GHG emissions from the transportation sector. Measures T-7 and T-8 are aimed at reducing GHG emissions from vehicle idling through traffic signal efficiencies, traffic calming measures, enforcement, and education (County of Santa Barbara 2015a). Similarly, Policy 2.1 of *Fast Forward 2040* and the 2017 Scoping Plan identify reducing traffic congestion as a means of decreasing mobile source GHG emissions (SBCAG 2017, CARB 2017). The proposed project is intended to reduce traffic congestion and associated vehicle idling, which in turn would decrease GHG emissions. Therefore, the proposed project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions, and no impact would occur.

Cumulative Impacts:

The geographic scope for related projects considered in the cumulative impact analysis for GHG emissions is global because impacts of climate change are experienced on a global scale regardless of the location of GHG emission sources. Therefore, as discussed under *County Environmental Thresholds*, GHGs and climate change are, by definition, cumulative impacts. As discussed under *Existing Setting*, the adverse environmental impacts of cumulative GHG emissions, including sea level rise, increased average temperatures, more drought years, and more large forest fires, are already occurring. As a result, cumulative impacts related to GHG emissions are significant. Thus, the issue of climate change involves an analysis of whether a project's contribution towards an impact is cumulatively considerable. Refer to items (a) and (b) for detailed discussions of the impacts of the proposed project related to climate change and GHG emissions. The contribution of the project to cumulative GHG emissions impacts would not be cumulatively considerable.

fewer air pollutant emissions over time. Therefore, assuming the use of the least-efficient equipment possible results in reasonable worst-case construction emissions.

Mitigation and Residual Impact:

No significant impacts were identified; therefore, mitigation is not required.

4.4 BIOLOGICAL RESOURCES

Will the proposal result in:	Poten. Signif.	Less than Signif. with Mitigation	Less Than Signif.	No Impact	Reviewed Under Previous Document
Flora					
a. A loss or disturbance to a unique, rare or threatened plant community?			✓		
b. A reduction in the numbers or restriction in the range of any unique, rare or threatened species of plants?			✓		
c. A reduction in the extent, diversity, or quality of native vegetation (including brush removal for fire prevention and flood control improvements)?			✓		
d. An impact on non-native vegetation whether naturalized or horticultural if of habitat value?			✓		
e. The loss of healthy native specimen trees?		✓			
f. Introduction of herbicides, pesticides, animal life, human habitation, non-native plants or other factors that would change or hamper the existing habitat?			✓		
Fauna					
g. A reduction in the numbers, a restriction in the range, or an impact to the critical habitat of any unique, rare, threatened or endangered species of animals?		✓			
h. A reduction in the diversity or numbers of animals onsite (including mammals, birds, reptiles, amphibians, fish or invertebrates)?		✓			
i. A deterioration of existing fish or wildlife habitat (for foraging, breeding, roosting, nesting, etc.)?		✓			
j. Introduction of barriers to movement of any resident or migratory fish or wildlife species?			✓		
k. Introduction of any factors (light, fencing, noise, human presence and/or domestic animals) which could hinder the normal activities of wildlife?		✓			

The following impact discussion is based, in part, on a biological resources reconnaissance survey of the biological survey area performed by Rincon Consultants, Inc. (Rincon) on December 12, 2019. The "biological survey area" for the proposed project is larger than the project's study area and includes parcels adjacent to the study area because potential impacts to biological resources could include indirect impacts that could occur outside the project study area. The biological survey area is composed of APNs 107-150-007, 107-150-015, 107-150-016, 107-150-018, 107-150-021, 107-150-022, 107-240-005, 107-240-008, 107-240-027, 107-240-043, 107-240-044, and 107-300-036 (see Figure 2 in Attachment 3 for the boundary of the biological survey area). The results of the biological resources reconnaissance survey are included in full as Attachment 3 (Rincon 2020a). In addition, Attachment 4 presents an analysis of the potential for special-status plant species to occur within the project study area, their current status, and their habitat requirements.

Existing Setting:

Flora

No native grasslands or other rare or sensitive vegetation communities or habitat types were observed within the biological survey area during the reconnaissance survey. The biological survey area contains four vegetation communities and land cover types: non-native perennial grassland, developed, agricultural, and ruderal. These communities and land cover types are described below.

Non-Native Perennial Grassland

This community is the most abundant non-developed land cover type within the biological survey area. It is dominated by the non-native perennial veldt grass (*Ehrharta calycina*), and occurs in a patchy distribution throughout the northern portion of the biological survey area and is predominant in the southeast portion of the biological survey area. Other non-native plant species found in this community include a windrow of planted blue gum trees, Russian thistle (*Salsola* spp.), coastal heron's bill (*Erodium cicutarium*), and black mustard (*Brassica nigra*). Individual native shrubs were also present amidst the non-native grassland, although not at a density that meets the criteria for designation as native scrub vegetation communities. These native shrubs include coyote brush (*Baccharis pilularis*), deerweed (*Acmispon glaber*), mock heather (*Ericameria ericoides*), and dune bush lupine (*Lupinus chamissonis*). Native telegraph weed (*Heterotheca grandiflora*) and whiteplume wirelettuce (*Stephanomeria exigua*) were also common throughout this community and adjacent to disturbed areas.

Developed

The developed land cover type includes areas that have been heavily disturbed or altered from natural vegetation. Developed portions of the biological survey area include a detention basin (Caltrans), roads, utilities, commercial buildings and their surrounding landscaping, recreational areas, and an active construction site for the SMJUHSD Agricultural Education and Career Technical Center. Landscaped portions of the biological survey area contain a variety of planted species, including coast live oak, Monterey cypress, Deodar cedar, blue gum eucalyptus, and blood red trumpet vine (*Distictis buccinatoria*).

Agricultural

Agricultural land is dominant in the northern and eastern portions of the biological survey area and consists of tilled and graded soils for crop production. Agricultural areas in the southeastern portion of the biological survey area also contained hoop structures for blackberry production. A windrow of planted blue gums is also present along the border of an agricultural area in the southeastern portion of the biological survey area.

Ruderal

This land cover type consists of primarily non-native vegetation growing in heavily disturbed areas, such as roadsides. Within the biological survey area, ruderal land can be found along U.S. Highway 101 and Rodeo Drive. Vegetation within this land cover type includes invasive plant species such as black mustard (*Brassica nigra*), perennial mustard (*Hirschfeldia incana*), Russian thistle (*Salsola kali*), and non-native annual grasses. Some native species also occur within these areas, such as telegraph weed and deerweed.

Special-Status Plant Species

Special-status plant species are those that are either listed as endangered or threatened under the Federal or California Endangered Species Acts, or rare under the California Native Plant Protection Act, or considered to be rare or of scientific interest (but not formally listed) by resource agencies, professional organizations (e.g., Audubon Society, California Native Plant Society [CNPS], The Wildlife Society), and the scientific community. For the purposes of this project, special-status plant species are defined as:

- Plants listed or proposed for listing as threatened or endangered under the Federal Endangered Species Act (50 Code of Federal Regulations 17.12 for listed plants and various notices in the Federal Register for proposed species).
- Plants that are candidates for possible future listing as threatened or endangered under the Federal Endangered Species Act (Federal Register, December 5, 2014).

- Plants that meet the definitions of rare or endangered species under the CEQA (CEQA Guidelines Section 15380).
- Plants presumed to be extinct or extirpated in California by the CNPS (California Rare Plant Rank [CRPR] 1A and 1B).
- Plants considered by the CNPS to be "rare, threatened, or endangered" in California (CRPR 1B and 2B).
- Plants listed or proposed for listing by the State of California as threatened or endangered under the California Endangered Species Act (14 California Code of Regulations 670.5).
- Plants listed as rare under the California Native Plant Protection Act (California Fish and Game Code Section 1900 et seq.).
- Plants considered sensitive by other Federal (e.g., United States Forest Service, Bureau of Land Management), State, or local agencies or jurisdictions.

Rincon searched the California Department of Fish and Wildlife (CDFW) California Natural Diversity Database (CNDDB) and the CNPS Online Inventory of Rare and Endangered Plants of California for the *Santa Maria, California* United States Geological Survey (USGS) 7.5-minute topographic quadrangle and the surrounding eight quads for previously documented occurrences of special-status species (USGS 2019a). Rincon also conducted a United States Fish and Wildlife Service (USFWS) query of the Information for Planning and Consultation System (IPaC) on September 24, 2019 for federally listed species that may be affected by the project. The CNDDB records of special-status species within a five-mile radius of the biological survey area and the USFWS IPaC-generated species list were further evaluated. The CNDDB and CNPS documented 39 special-status plant species recorded within a five-mile radius of the biological survey area . The analysis indicates that one special-status plant species has a low potential to occur within the biological survey area , Hoover's bent grass (*Agrostis hooveri*), because marginally suitable habitat is present within grasslands. No other special-status plant species are expected to occur.

Wetlands and Other Jurisdictional Waters

According to the USFWS National Wetlands Inventory, there are no permanent surface water bodies or wetlands located within the biological survey area (USFWS 2019). Two culverts constructed for the purpose of diverting storm water away from paved roads occur within the biological survey area. Neither culvert is associated with a natural drainage. The culverts direct stormwater runoff from paved roadways and constructed roadside swales. No water was observed in these swales at the time of the reconnaissance survey. Vegetation in these swales did not diverge from surrounding land cover types and consisted primarily of non-native grasses.

At the time of the site visit, water was observed ponding on a portion of the biological survey area beneath a row of planted eucalyptus trees along the border of a recently graded agricultural field. No other vegetation was observed beneath the eucalyptus trees, and the ponded area appears to have been previously graded and the area used for vehicle and equipment parking. The ponded area was downslope of the recently graded agricultural field and was formed by previous grading activities and accumulation of recent rainwater runoff from rain events within the last two weeks prior to the reconnaissance survey. The maximum water depth in the ponded area was less than six inches at the time of the survey.

Neither the two culverted areas nor the ponded location within the biological survey area appear to be associated with naturally occurring waterways; therefore, it is unlikely that they are under the jurisdiction of the U.S. Army Corps of Engineers, Regional Water Quality Control Board, and/or California Department of Fish and Wildlife. It should be noted that a formal jurisdictional delineation was not performed as part the reconnaissance survey and that final jurisdictional determinations are at the final discretion of the applicable resource agency.

Fauna

Wildlife observed during the reconnaissance survey consisted primarily of bird species. A black-tailed jackrabbit (*Lepus californicus*) was the only mammalian species observed during the survey, but tracks of other mammals, including mule deer (*Odocoileus hemionus*), coyote (*Canus latrans*), and grey fox (*Urocyon cinereoargenteus*) were observed within the biological survey area. A complete list of all animal species observed during the reconnaissance survey is included in Attachment 3.

A red-tailed hawk (*Buteo jamaicensis*) nest was observed in the southeastern portion of the biological survey area. The nest was observed in a blue gum tree on the edge of non-native perennial grassland to the west of U.S. Highway 101 in the biological survey area. The nest did not appear to be active (no eggs or nestlings were observed) at the time of the survey; however, two adult red-tailed hawks were present near the nest throughout the duration of the survey, and it is likely that the nest will become active in late Winter/early Spring 2020. Red-tailed hawks typically breed from March through July, with the breeding season peaking in May and June.

Special-Status Wildlife Species

For the purposes of this project, special-status wildlife species are defined as:

- Animals listed or proposed for listing as threatened or endangered under the Federal Endangered Species Act (50 Code of Federal Regulations 17.11 for listed animals and various notices in the Federal Register for proposed species).
- Animals that are candidates for possible future listing as threatened or endangered under the Federal Endangered Species Act (Federal Register, December 5, 2014).
- Animals that meet the definitions of rare or endangered species under CEQA (CEQA Guidelines Section 15380).
- Animals listed or proposed for listing by the State of California as threatened or endangered under the California Endangered Species Act (14 California Code of Regulations 670.5).
- Animal species of special concern to the CDFW (CDFW 2016).
- Animal species that are fully protected in California (California Fish and Game Code Sections 3511 [birds], 4700 [mammals], and 5050 [reptiles and amphibians]).

The CNDDB search conducted for this impact analysis indicates that seven special-status wildlife species have a low potential to occur within the biological survey area: monarch butterfly (California overwintering population; *Danaus plexippus*), California tiger salamander (*Ambystoma californiense*; CTS), California red-legged frog (*Rana draytonii*; CRLF), western spadefoot (*Spea hammondii*), northern California legless lizard (*Anniella pulchra*), coast horned lizard (*Phrynosoma blainvillii*), and American badger (*Taxidea taxus*). These seven species have been recorded within two miles of the biological survey area. No other special-status wildlife species are expected to occur.

Wildlife Corridors

The biological survey area is not located within any mapped wildlife corridors (CDFW 2010).

County Environmental Thresholds:

The County Environmental Thresholds (County of Santa Barbara 2018a) includes guidelines for the assessment of biological resource impacts. The following thresholds are applicable to this project:

Wetlands: Projects which result in a net loss of important wetland area or wetland habitat value, either through direct or indirect impacts to wetland vegetation, degradation of water quality, or would threaten the continuity of wetland-dependent animal or plant species are considered to have a potentially significant effect on the environment. Projects which substantially interrupt wildlife access, use and dispersal in wetland areas would typically be considered to have a potentially significant impact. Projects which disrupt the hydrology of wetlands systems would be considered to have a potentially significant impact.

Native Grasslands: In general, project created impacts to native grasslands may be considered significant if they involve removal of or severe disturbance to a patch or a combined patch area of native grasses that is greater than 0.25 acre in size. The grassland must contain at least 10 percent relative cover of native grassland species (based on a sample unit). Impacts to patch areas less than 0.25 acre in size that are clearly isolated and not part of a significant native grassland or an integral component of a larger ecosystem are usually considered insignificant.

Other Rare Habitat Types: The Manual recognizes that not all habitat-types found in Santa Barbara County are addressed by the habitat-specific guidelines. Impacts to other habitat types or species may be considered significant, based on substantial evidence in the record, if they substantially: (1) reduce or eliminate species diversity or abundance; (2) reduce or eliminate the quality of nesting areas; (3) limit reproductive capacity through losses of individuals or habitat; (4) fragment, eliminate, or otherwise disrupt foraging areas and/or access to food sources; (5) limit or fragment range and movement; or (6) interfere with natural processes, such as fire or flooding, upon which the habitat depends.

Native Trees: The County considers native specimen trees, regardless of size, to be potentially significant. Rare native trees that are very low in number or isolated in distribution may be particularly significant. The significance evaluation is performed on a case-by-case basis and considers tree size, numbers, location, and relationship to habitat among other factors. Specimen trees are defined as mature trees that are healthy and structurally sound and have grown into the natural stature particular to the species. In general, the County considers the loss of 10 percent or more of the trees of biological value on a project site to be potentially significant.

Impact Discussion:

Flora:

a-d. **Less than significant**. As described under *Existing Setting*, the biological survey area contains four vegetation communities and land cover types: non-native perennial grassland, developed, agricultural, and ruderal. No native grasslands or other rare or sensitive vegetation communities or habitat types were observed within the biological survey area during the reconnaissance survey. No impacts to special-status plant communities would occur.

The CNDDB search results included in Attachment 4 indicated that one special-status plant species, Hoover's bent grass, has a low potential to occur within the biological survey area. No other special-status plant species are expected to occur in the biological survey area. Hoover's bent grass is not federally or state listed as threatened or endangered; this species is CNPS California Rare Plant Rank (CRPR) 1B.2, which indicates the species is "rare, threatened, or endangered in California and elsewhere" and "fairly endangered in California (20 to 80 percent occurrences threatened)." No Hoover's bent grass was observed during the biological resources reconnaissance survey of the biological survey area; however, the survey was not conducted during the species' blooming period. Nonetheless, the biological survey area is not included in the current distribution area of Hoover's bent grass (Calflora 2020) and is therefore unlikely to occur within the biological survey area. In addition, the species is not listed as threatened or endangered under the Federal Endangered Species Act and the California Endangered Species Act. Given that the biological survey area consists of disturbed and non-native habitats and that this species is unlikely to occur in the biological survey area, the project would have less-than-significant impacts to this species. Given the low sensitivity of this species and the fact that this species is unlikely to occur in the biological survey area because the area consists of disturbed and non-sensitive vegetation communities, the project would have less-than-significant impacts to this species.

No mapped permanent surface water bodies or wetlands are located within the biological survey area. In addition, no wetlands, drainages, or features associated with naturally-occurring waterways were observed during the reconnaissance survey. The two culverts and ponded area observed in the biological survey area during the survey are unlikely to be under the jurisdiction of the U.S. Army Corps of Engineers, Regional Water Quality Control Board, and/or California Department of Fish and Wildlife because none of these features appear to be associated with naturally occurring waterways (Attachment 3). Accordingly, the project would not impact jurisdictional water features, including wetlands.

e. **Less than significant with mitigation.** Based on observations made during the reconnaissance survey, the only native tree species that occurs within the biological survey area is the coast live oak (*Quercus agrifolia*). Several coast live oak trees are located on the Elk Unocal Event Center property, adjacent to Rodeo Drive. At least one of these trees may be impacted by construction of the proposed project, either through direct removal or encroachment into the dripline. Therefore, the project could result in the loss of at least one native tree and this impact would be potentially significant. With implementation of Mitigation Measure Bio-02 (see below), which requires tree protection measures and replacement as needed, the potential impact would be reduced to a less-than-significant level. Therefore, potential impacts to native trees would be less than significant with mitigation.

f. **Less than significant**. The proposed project would permanently pave over a small portion of existing undeveloped land that may provide marginal habitat for plant species, thereby precluding any future functional habitat value for these species. However, the project would not include use of herbicides or pesticides and would not introduce animal life, human habitation, non-native plants, or other factors that would change or hamper existing habitat for plants beyond the project's area of disturbance. Therefore, impacts would be less than significant.

Fauna

g, h. **Less than significant with mitigation**. According to the CNDDB search results summarized in Attachment 4, seven special-status wildlife species have a low potential to occur on the biological survey area: monarch butterfly (California overwintering population), CTS, CRLF, western spadefoot, northern California legless lizard, coast horned lizard, and American badger. No other special-status wildlife species are expected to occur within the biological survey area.

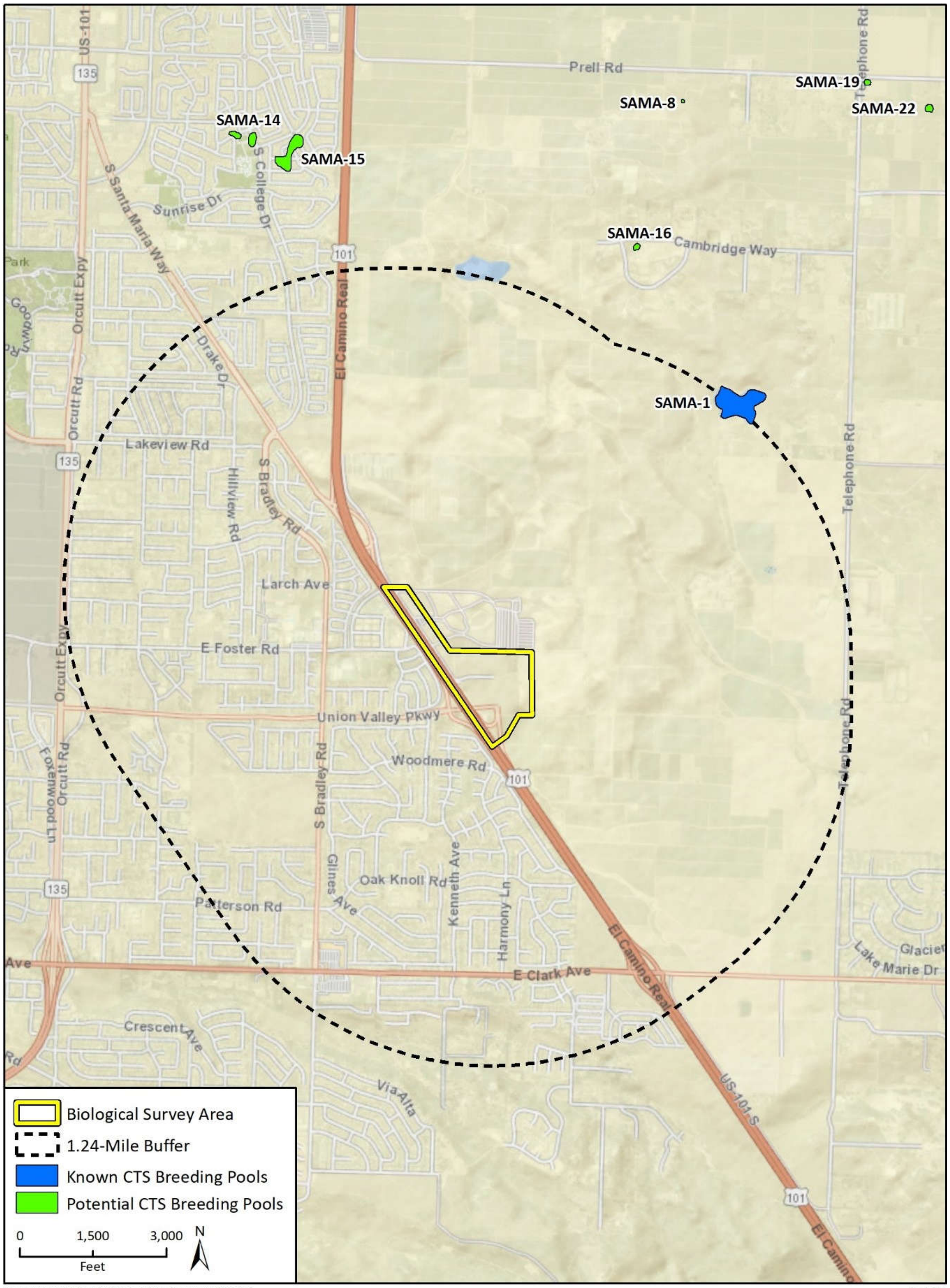
The monarch butterfly is not federally or state listed as threatened or endangered, but is still considered to be a sensitive species. The biological survey area provides marginally suitable habitat for the monarch butterfly. Although the CNDDB documented an occurrence of monarch butterfly within 2.0 miles of the biological survey area, the biological survey area does not contain wind-protected tree groves suitable for winter roost sites for California's overwintering population of this species. Trees are present along Morningside Drive (a gated, private road) in the biological survey area; however, the trees are not located in a wind-protected grove and therefore would not be considered suitable winter roosting habitat for California's overwintering population of this species. Accordingly, removal of marginally suitable trees for monarch butterfly winter roosting due to the project would not substantially reduce or eliminate species diversity or abundance; substantially limit reproductive capacity through losses of individuals or habitat; substantially fragment, eliminate, or otherwise disrupt foraging areas and/or access to food sources; substantially limit or fragment range and movement (geographic distribution of animals); or substantially interfere with natural processes, such as fire or flooding, upon which the monarch's habitat depends. Per Chapter 6 of the County Environmental Thresholds (2018a), impacts to the monarch butterfly would not be significant. In addition, the biological survey area includes historical disturbance from intensive agriculture and vegetation within the biological survey area is composed of primarily ruderal plant species resulting from pre-existing human-made disturbance. Given the low sensitivity of this species, the fact this species is unlikely to occur in the biological survey area because the lack of suitable winter roosting habitat, and the other aforementioned reasons, the project would have less-than-significant impacts to the monarch butterfly.

The CTS is a federally and state listed as threatened. The CTS is not expected to occur within the biological study area due to the lack of suitable breeding habitat, the high level of disturbance, and the lack of small mammal burrows. The biological study area is not located within federally designated critical habitat for CTS and is located west of the East Santa Maria metapopulation based on mapping in the *Recovery Plan for the Santa Barbara County Distinct Population Segment of the California Tiger Salamander* (USFWS 2016). In addition, the distance CTS individuals disperse from breeding locations within upland habitat is 1.24 miles (USFWS 2010); however, the nearest known or potential breeding pond (designated as SAMA-1) for CTS is located approximately 1.5 miles northeast of the biological study area (Figure ~~46~~6), which is farther than the distance CTS disperses from breeding locations within upland habitat. Furthermore, opportunities for CTS movement into the biological study area from SAMA-1 are extremely limited. Based on review of aerial imagery of the project area, approximately 0.8 mile of contiguous active agricultural land, including plowed fields and hoop houses, occurs between the biological study area and SAMA-1. Therefore, existing active agricultural activities would preclude CTS movement within and adjacent to the biological study area.

The CRLF is a federally listed as threatened and a state species of special concern, and the western spadefoot is a state species of special concern. CRLF and western spadefoot occurrences have been documented within 2.0 miles of the biological survey area. No permanent freshwater bodies are mapped within the biological survey area; however, water was observed ponding in the biological survey area beneath a row of planted eucalyptus trees along the border of a recently graded agricultural field. The ponded area was downslope of the recently graded agricultural field and was formed by previous grading activities and accumulation of recent rainwater runoff from rain events within the last two weeks prior to the reconnaissance visit. This ponded area and/or other ponded areas may or may not be present when project construction would occur. If these ponded areas are present in the biological survey area at the time of construction, CRLF and western spadefoot may also be present; however, considering these ponded areas are human-made, poor quality, and located in active agricultural land, both species have a low potential to occur within the biological study area. Irrigation ponds occur within 3.0 miles of the study area and such ponds may provide marginal breeding habitat for CRLF and western spadefoot. According to the CNDDB, no CRLF or western spadefoot occurrences or breeding ponds have been reported within the biological survey area.

The northern California legless lizard, coast horned lizard, and American badger are state species of special concern. Occurrences of northern California legless lizard and coast horned lizard were recorded within 1.0 mile of the biological survey area, and suitable habitat for these species exists within the biological survey area. An occurrence of one deceased American badger (roadkill on U.S. Highway 101) was also recorded in 1990 within 0.3 mile of the biological survey area, and burrows for rodents, which are the primary prey for the American badger, may be present in open areas and disturbed land within the biological survey area.

Figure 46 Known and Potential California Tiger Salamander Ponds



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Construction Impacts

The quality of habitat is poor within the biological survey area because the area has been subject to disturbance related to agricultural activities and development of U.S. Highway 101, the Elks Unocal Event Center, commercial development, and the (currently under construction) SMJUHSD Agricultural Education and Career Technical Center. Due to the lack of suitable habitat within the biological survey area for monarch butterfly and CTS, no impacts to these species would occur. If the remaining aforementioned special-status wildlife species are present in the project construction footprint during construction, the proposed project could potentially result in significant impacts if individuals are harmed or killed. With implementation of Mitigation Measures Bio-01 and Bio-03 through Bio-0~~6~~5 (see below), which require a preconstruction field reconnaissance-level biological survey; preconstruction habitat assessment and protocol surveys for CRLF and western spadefoot; preconstruction special-status wildlife species survey; American badger burrow mapping; and biological monitoring during construction, as needed, the potential impacts would be reduced to a less-than-significant level. Therefore, project construction impacts to CRLF, western spadefoot, northern California legless lizard, coast horned lizard, and American badger would be less than significant with mitigation.

Operational Impacts

The proposed project would result in a future local road connection that would increase the amount of paved surfaces within the biological survey area, and thus, increase the potential for roadkill, as well as increased exposure to predators due to lack of vegetation coverage. The proposed roadway would not create a new barrier to movement/migration of CRLF, western spadefoot, coast horned lizard, or northern California legless lizard because the biological survey area abuts U.S. Highway 101, which currently acts as a barrier to east-west wildlife movement in the project area. Therefore, suitable habitat for special-status wildlife species with potential to occur within the biological study area would not be substantially degraded beyond existing conditions because the project would permanently pave over a relatively small portion of existing disturbed land that may provide marginal habitat for wildlife species, thereby precluding any future functional habitat value for special-status wildlife species.

In addition, the study area is within the known range for American badger and may contain suitable friable soils for burrowing. The proposed project may result in the removal of suitable American badger habitat by increasing the amount of paved surfaces within the biological survey area. However, due to the existing disturbed nature of the habitat and current agricultural operations within the biological survey area, it is unlikely that the species is present.

Therefore, project operational impacts to special-status wildlife species would be less than significant.

i. **Less than significant with mitigation**. The overall quality of habitat is poor within the biological survey area because the area has been subject to disturbance related to agricultural activities and development of U.S. Highway 101, the Elks Unocal Event Center, commercial development, and the SMJUHSD Agricultural Education and Career Technical Center. However, as discussed under items (g) and (h), project construction would have potentially significant impacts to CTS and western spadefoot, which would be mitigated to a less than significant level through implementation of Mitigation Measures Bio-01 and Bio-03 through Bio-0~~6~~5. In addition, vegetation removal and construction activities could result in potentially significant impacts to nesting birds if conducted during the nesting season. The Federal Migratory Bird Treaty Act (MBTA) of 1918 (50 Code of Federal Regulations Section 10.13) protects migratory non-game native bird species by international treaty. Sections 3503, 3503.5, and 3513 of the California Fish and Game Code prohibit take (as defined therein) of all native birds and their active nests, including raptors and other migratory non-game birds (as listed under the MBTA). To comply with the MBTA and California Fish and Game Code, Mitigation Measure Bio-0~~7~~6 (see below) requires preconstruction nesting bird surveys to ensure no direct impacts occur to any nesting birds or their eggs, chicks, or nests during the bird nesting season. With implementation of Mitigation Measure Bio-0~~7~~6, the potential impacts would be reduced to a less-than-significant level.

Therefore, impacts to nesting birds during project construction would be less than significant with mitigation.

j. **Less than significant**. The biological survey area is not located within a mapped wildlife corridor (CDFW 2010). Several barriers to wildlife movement currently exist in the vicinity of the study area, including U.S. Highway 101 and the residential development west of the highway. In addition, the quality of habitat is poor within the biological survey area because the area has been subject to disturbance related to agricultural activities and development of U.S. Highway 101, the Elks Unocal Event Center, commercial development, and the (currently under construction) SMJUHSD Agricultural Education and Career Technical Center. The proposed project would increase the amount of paved surfaces within the biological survey area, which could result in a barrier to wildlife movement; however, wildlife movement would not be substantially impaired beyond existing conditions, because the project would permanently pave over a small portion of existing disturbed land that may provide marginal habitat for wildlife species, thereby precluding any future functional habitat value for wildlife. Therefore, impacts related to wildlife movement would be less than significant.

k. **Less than significant**. The proposed project would permanently pave over a small portion of existing disturbed land that may provide marginal habitat for wildlife species, thereby precluding any future functional habitat value for these species. In addition, the project would result in additional traffic volumes on the southern segment of Rodeo Drive that currently experiences low traffic volumes, which would increase traffic-related noise in this area. However, as discussed in Section 4.11, *Noise*, ambient noise levels in the study area are dominated by noise generated by vehicular traffic on U.S. Highway 101, and the project would not substantially alter noise levels in the study area. In addition, the project would not introduce new light sources, fences, or domestic animals that could hinder the normal activities of wildlife. Therefore, impacts would be less than significant.

Cumulative Impacts:

With implementation of mitigation measures, the proposed project would result in less-than-significant impacts to biological resources. Cumulative development in the community of Orcutt, the city of Santa Maria, and Key Site 33 includes 1,122 new residential units, 402,702 square feet of commercial/office/industrial space, 240 motel rooms, and the SMJUHSD Agricultural Education and Career Technical Center, all of which are currently planned for, proposed, in process, approved, and/or under construction. Buildout of the Orcutt and Santa Maria area would continue to urbanize this area and could result in additional impacts to biological resources. The Orcutt Community Plan EIR (County of Santa Barbara 1994) identified potentially significant cumulative impacts to biological resources, including wetlands, riparian, central dune scrub, oak woodlands, central coast scrub, and sandhill chaparral communities resulting from Orcutt Community Plan buildout. The potential biological resources impacts of each project would be addressed on a case-by-case basis as individual projects are reviewed by County decision-makers. Implementation of County policies and development standards related to biological resources such as Orcutt Community Plan Policies BIO-O-1 through BIO-O-5 would minimize these potential cumulative impacts. Although cumulative biological resources impacts would be potentially significant, the proposed project's contribution to such impacts would not be cumulatively considerable and would therefore be less than significant.

Mitigation and Residual Impact:

The proposed project could result in potentially significant impacts if sensitive biological resources are present within the project construction footprint. With implementation of Mitigation Measure Bio-01 in combination with the remaining mitigation measures for biological resources, potential impacts would be reduced to a less-than-significant level:

MM Bio-01 **Preconstruction Field Reconnaissance-Level Biology Survey.** Prior to the initiation of construction activities, a preconstruction survey shall be conducted within the project construction footprint plus a 500-foot buffer by a qualified biologist in accordance with protocols established by the CDFW and USFWS. The purpose of the survey shall be to determine if sensitive biological resources are present or have the potential to be present during the construction period.

TIMING: The project proponent shall submit the survey report to the County, and the CDFW and/or USFWS, as appropriate, for review and approval prior to grading and construction permit issuance, if required, or no more than one year prior to commencement of construction. Native trees identified on-site shall be mapped onto a site-specific aerial photograph and topographic map and submitted to the County prior to grading and construction permit issuance.

MONITORING: The County, and the CDFW and/or USFWS, as appropriate, shall review the survey report prior to issuance of grading and construction permits. County staff shall conduct site inspections to ensure compliance during grading and construction.

The proposed project could result in a potentially significant impact to at least one native tree due to alteration or removal. With implementation of Mitigation Measure Bio-02, the potential impact would be reduced to a less-than-significant level:

MM Bio-02 **Tree Protection Without a Tree Protection Plan.** All grading, trenching, ground disturbance, and construction activities shall occur beyond six feet of the dripline of all native trees.

a. Prior to the issuance of a permit, if required, for grading and construction, all native trees shall be fenced at least six feet beyond the dripline. Fencing shall be at least three feet in height of chain link or other material acceptable to the County and shall be staked every six feet. The project proponent shall place signs stating “tree protection area” at 15-foot intervals on the fence. Fencing shall remain in place throughout all grading and construction activities.
b. Any unanticipated damage to trees from construction activities shall be mitigated in a manner approved by the County. This mitigation shall include but is not limited to tree replacement at a ratio of 1:1 or greater, and hiring of an outside consulting biologist or arborist to assess damage and recommend mitigation. The project proponent shall specify the impacted and replacement species, sizes, irrigation period in years, and locations of the replacement trees. The required mitigation shall be implemented under the direction of County staff prior to any further work occurring on site.

PLAN REQUIREMENTS: Fencing shall be graphically depicted on project plans.

TIMING: This condition shall be printed on project plans submitted for grading and construction permit approval, if required. Required fencing shall be installed prior to commencement of construction.

MONITORING: County staff shall review plans and confirm fence installation. County staff shall conduct site inspections to ensure compliance during grading and construction. If native trees are removed, the project proponent shall also demonstrate to the County that the replacement trees have been planted prior to final inspection.

The proposed project could result in a potentially significant impact if special-status wildlife species are present within the study area during construction. With implementation of Mitigation Measures Bio-03 through Bio-0~~6~~5, the potential impacts would be reduced to a less-than-significant level:

MM Bio-03 **Preconstruction Habitat Assessment and Protocol Surveys for CRLF and Western Spadefoot.** Prior to the initiation of construction activities, a habitat assessment for CRLF shall be conducted within the project construction footprint plus a 500-foot buffer by a County-qualified biologist following the USFWS's *Revised Guidance on Site Assessments and Field Surveys for the California Red-legged Frog* (August 2005). Surveys for western spadefoot shall be conducted concurrently with the habitat assessment for CRLF. If western spadefoot adults or larvae are observed, CDFW shall be contacted. If the habitat assessment for CRLF identifies suitable habitat for the species, protocol surveys or modified protocol surveys, as appropriate, for the species shall be conducted in accordance with USFWS and CDFW protocols. The surveys shall include mapping of current locations of CRLF and western spadefoot for avoidance and relocation efforts and to assist construction monitoring efforts. If suitable habitat is identified and/or individuals of CRLF or western spadefoot are observed, Mitigation Measures Bio-04 and Bio-0~~6~~5 shall be implemented, as appropriate.

TIMING: The habitat assessment shall be conducted by a qualified biologist approved by the County no more than one month prior to the initiation of construction activities. On-site locations of observed CRLF and western spadefoot and potentially suitable habitat for the species shall be mapped onto a site-specific aerial photographic map.

MONITORING: The County, and the CDFW and/or USFWS, as appropriate, shall review the site-specific aerial photographic map showing the on-site locations of observed CRLF and western spadefoot and potentially suitable habitat prior to issuance of grading and construction permits.

MM Bio-04 **Preconstruction Special-Status Wildlife Species Survey.** Prior to the initiation of construction activities, a County-qualified biologist shall conduct a survey to evaluate the presence/absence of special-status wildlife species with a potential to occur within the biological study area (e.g., monarch butterfly, CRLF, western spadefoot, coast horned lizard, northern California legless lizard, and American badger) within the project construction footprint plus a 100-foot buffer. The survey shall include all components within the project construction footprint, including access roads and staging areas. The survey shall be conducted no more than 48 hours prior to the commencement of construction activities. If special-status wildlife species are observed within the project construction footprint and cannot be avoided by the project (e.g., unable to safely move out of the project area on its own volition, nests or dens are observed within the study area), the biologist shall notify the County and the appropriate agency (e.g., USFWS, CDFW) biological staff within one work day of the observation, and further consultation with the agencies shall be conducted to determine the appropriate course(s) of action before proceeding with construction activities. Potential courses of action may include, but will not be limited to, delay of construction schedule, or capture and relocation of individuals to adjacent appropriate habitat at least 200 feet from limits of construction activities by a USFWS-approved biologist authorized to capture and relocate federally-listed species. If relocation is required, the qualified biologist shall temporarily move any identified special-status species outside of the construction area, and temporary barriers shall be placed around the construction area, as practicable, to prevent ingress by special-status species. Construction shall not proceed until the work area is determined to be free of special-status species. The results of these surveys shall be documented in a technical memorandum. County, and the CDFW and/or USFWS, as appropriate, shall review the report of the survey results prior to issuance of grading and construction permits.

MM Bio-0~~6~~5 **Biological Monitoring During Construction**. If the habitat assessment for CRLF identifies suitable habitat and preconstruction or protocol surveys have identified presence, formal consultation with the USFWS and/or CDFW shall be required. In addition, if the surveys do not identify presence of CRLF but the study area contains suitable habitat, a biological monitor shall be on-site during all project construction activities that involve removal of the first 12 inches of soil/substrate, when ponded or flowing water is present, and work within sensitive habitat areas where sensitive species may be present (e.g., work within suitable upland or breeding habitat). If CRLF is observed within the project construction footprint during project construction and cannot be avoided by the project (e.g., unable to safely move out of the project area on its own volition, nests or dens are observed within the project construction footprint), a qualified biologist shall notify the appropriate agency (e.g., USFWS, CDFW) biological staff within one work day of the detection and further consultation with the agencies shall be conducted to determine the appropriate course(s) of action before proceeding with construction activities. Potential courses of action may include, but will not be limited to, delay of the construction schedule or capture and relocation of individuals to adjacent appropriate habitat at least 200 feet from the grading limits. Only a USFWS-approved biologist shall be authorized to capture and relocate federally-listed species.

After the previously-specified construction activities have been completed that require a biological monitor to be on-site, the monitor shall then conduct weekly spot checks, for a minimum two-hour period per day. Dependent upon work conditions and/or prolonged construction activities, the County may discuss a potential decrease in biological monitoring in coordination with the USFWS and CDFW, as appropriate.

TIMING: The project proponent shall designate a qualified biologist prior to the commencement of construction activities.

MONITORING: The County, and the CDFW and/or USFWS, as appropriate, shall inspect the project construction area.

The proposed project could result in a potentially significant impact if vegetation removal and project construction activities adversely affect nesting birds or their eggs, chicks, or nests during the bird nesting season. With implementation of Mitigation Measure Bio-0~~7~~6, the potential impact would be reduced to a less-than-significant level:

MM Bio-0~~7~~6 **Preconstruction Nesting Bird Surveys.** To avoid impacts to nesting birds, tree removal and vegetation clearance shall be scheduled outside of the nesting season (February 1 to August 31). If vegetation clearance must occur during the nesting season, the following avoidance measures shall be implemented:

a. If work occurs between February 1 and August 31, a preconstruction nesting bird survey shall be conducted within one week of ground-disturbing activities. If surveys do not locate nesting birds, construction activities may be conducted.
b. If nesting birds are located, no construction activities shall occur within 100 feet of nests until chicks are fledged or the nest becomes inactive. Construction activities shall observe a 300-foot buffer for active raptor nests. The buffer from nests may be reduced based on a qualified biologist's recommendations.
c. Occupied nests shall be mapped using GPS or survey equipment. A preconstruction survey report shall be submitted to the County immediately upon completion of the survey. The report shall detail appropriate fencing or flagging of the buffer zone and make recommendations for additional monitoring requirements. A map of the project construction footprint and nest locations shall be included with the report. The

biologist conducting the nesting surveys shall have the authority to reduce or increase the recommended buffer depending upon site conditions.

d. Occupied nests shall be monitored regularly to document nest success and check for project compliance with buffer zones.
e. Appropriate best management practices (BMPs) shall be utilized to minimize noise disturbances to sensitive bird species.

PLAN REQUIREMENTS: These requirements shall be noted in plan specifications.

TIMING: Compliance shall be verified prior to and during construction within the nesting season.

MONITORING: The County shall perform periodic site inspections to ensure compliance with these requirements.

4.5 CULTURAL RESOURCES

Will the proposal:	**Poten. Signif.**	**Less than Signif. with Mitigation**	**Less Than Signif.**	**No Impact**	**Reviewed Under Previous Document**
a. Cause a substantial adverse change in the significance of any object, building, structure, area, place, record, or manuscript that qualifies as a historical resource as defined in CEQA Section 15064.5?			✓		
b. Cause a substantial adverse change in the significance of a prehistoric or historic archaeological resource pursuant to CEQA Section 15064.5?			✓		
c. Disturb any human remains, including those located outside of formal cemeteries?				✓	
d. Cause a substantial adverse change in the significance of a tribal cultural resource, defined in the Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is: 1) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or 2) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.				✓	

The following impact discussion is based, in part, on a cultural resources assessment prepared by Rincon (2020), which is included as Attachment 5.

Existing Setting:

Archaeological Resources

For at least the past 10,000 years, the area that is now Santa Barbara County has been inhabited by Chumash Indians and their ancestors. Over the last 75 years, the study area has been subject to previous ground disturbance in conjunction with agricultural and development activities, the latter of which is associated with road construction and maintenance, the Elks Unocal Event Center, commercial structures, and the SMJUHSD Agricultural Education and Career Technical Center.

On September 30, 2019, Rincon conducted a records search of the California Historical Resources Information System at the Central Coastal Information Center (CCIC) at University of California, Santa

Barbara. The purpose of the records search was to identify previously recorded cultural resources as well as prior cultural resources studies within the study area and a 0.25-mile radius surrounding it. The records search found that archaeologists had completed 16 cultural resource studies within 0.25 mile of the study area between 1979 and 2013 (Table 6). Of these, nine studies (SR-00319, SR-04451 SR-04603, SR-04603A, SR-04603B, SR-04603C, SR-04603D, SR-04603E, SR-04605) include approximately 60 percent of the study area. See Attachment 5 for summaries of the nine previous studies. In summary, the cultural resources records search performed for the project identified no previously recorded archaeological resources within the study area or within 0.25 mile of the study area.

Table 6 Previously Conducted Cultural Resources Studies within 0.25 Mile of the Study Area

Report Number	Author(s)	Year	Title
SR-00319	Spanne, Larry	1979	*An Archaeological Evaluation for the "Orcutt 13" Residential Developments County of Santa Barbara*
SR-00325	Spanne, Larry	1980	*An Archaeological Evaluation for Tract No. 12,995 Orcutt, California, County of Santa Barbara*
SR-00382	Spanne, Larry	1980	*An archaeological evaluation for the proposed Quail Meadows Estates, Santa Maria Way Mobile Home Park, County of Santa Barbara*
SR-02620	Robert O. Gibson	2000	*Results of Phase 1 Archaeological Surface Survey and Archival Research Search For the Orcutt Plaza Project, Orcutt, Santa Barbara County, CA*
SR-02669	Duke, C.	2001	*Cultural Resource Assessment for Cingular Wireless Facility No. VY 038-03 Santa Barbara County, California*
SR-03309	Dice, M.	2003	*Records Search and Site Visit Results for Sprint Telecommunications Facility SN45XC107A (St. Joseph High School), 4120 S. Bradley Road, Santa Maria, Santa Barbara County, California*
SR-04451	Kiaha, Krista	2007	*Archaeological Survey Report, Union Valley Parkway Project, 05-SB-101-PM 83.1/83.9, EA 05-463800*
SR-04603	Nettles, Wendy M.	2008	*Historic Property Survey Report, Union Valley Parkway*
SR-4603A	Kiaha, Krista	2007	*Archaeological Survey Report: Union Valley Parkway Project 05-SB-101-PM 83.1/83.9, EA 05-463800*
SR-4603B	Gerber	2000	*Unknown*
SR-04603C	Gerber	2001	*Unknown*
SR-04603D	Gerber, Joyce L. and Leeann Haslouer	2006	*Archaeological Survey Report for the Union Valley Parkway Extension in Santa Maria, Santa Barbara County, California*

Report Number	Author(s)	Year	Title
SR-4603E	Taniguchi, Christeen, Ben Taniguchi, David Livingstone, Peggy Beedle, Sandra S. Flint, and Randy Baloian	2007	*Historical Resources Evaluation Report for the Union Valley Parkway Extension Project in Santa Maria, Santa Barbara County, California*
SR-04605	Peterson, Jr., Robert R.	2008	*Supplemental Historical Property Survey Report, Union Valley Pkwy/US 101*
SR-04759	Perez, Don C.	2011	*Cultural Resources Analysis: St. Joseph's HS / SF91580A. 4120 South Bradley Road, Santa Maria, Santa Barbara County, California 93455. EBI Project No. 61111999*
SR-05045	Nawi, Carol	2013	*CLU4382/3553606438 St. Joseph High School, 4120 South Bradley Road Santa Maria (Santa Barbara County) CA*
Source: Rincon 2020b			

Historical Resources (Built Environment)

Built environment properties within the study area include buildings and seating associated with the Elks Unocal Event Center, which was constructed in 1999. The Elks Unocal Event Center is less than 45 years old and therefore does not warrant further evaluation as a historical resource.

Tribal Cultural Resources

The County conducted Native American consultation consistent with Assembly Bill 52 and Senate Bill 18 for the project to identify potential concerns or issues associated with Native American cultural resources near the project. The County of Santa Barbara submitted a Sacred Lands File search to the Native American Heritage Commission, and on August 29, 2019, the Native American Heritage Commission indicated that there are no known sacred lands in the project vicinity. The Native American Heritage Commission provided a list of Native American tribes with traditional lands or cultural places in the project area that may have knowledge of cultural resources at the study area.

As required by Public Resources Code (CEQA) Section 21080.3.1 (Assembly Bill 52), the County mailed a consultation letter on August 14, 2019 to the Chair of the Barbareño/Ventureño Band of Mission Indians. In part, the County offered to consult with the chair or other tribal representatives regarding the proposed project. Under Assembly Bill 52, Native American tribes have 30 days to respond and request further project information and formal consultation. The consultation request period closed on September 13, 2019. The County did not receive a reply to its letter.

As required by California Government Code Sections 65352.3 and 65352.4 (Senate Bill 18), the County prepared and mailed consultation letters on September 9, 2019 to each contact requesting any information they may have regarding the presence of cultural resources on or near the study area. Under Senate Bill 18, Native American tribes have 90 days to respond and request further project information and formal consultation. Therefore, the consultation request period for all tribes closed on December 8, 2019. The County did not receive a reply from any of the contacts during the consultation period for Assembly Bill 52; however, the Santa Ynez Band of Chumash Indians commented on the Draft IS-MND. The County met with the Santa Ynez Band of Chumash Indians on June 3, 2020 to discuss the tribe’s concerns. The cultural resources mitigation measures included as part of the Draft IS-MND address the concerns of the Santa Ynez Band of Chumash Indians.

Pedestrian Survey

Rincon conducted a pedestrian survey of the study area on December 13, 2019 (Attachment 5). Overall ground visibility was approximately 20 percent with 100 percent exposure. One unmodified Pismo clam shell fragment was observed within the study area during the survey. No other cultural resources were observed within the study area during the pedestrian survey (Rincon 2020b).

County Environmental Thresholds:

Chapter 8 of the County Environmental Thresholds (2018a) contains guidelines for the identification, significance evaluation, and mitigation of impacts to cultural resources, including archaeological, historic, and tribal cultural resources. In accordance with the requirements of CEQA, these guidelines specify that if a resource cannot be avoided, it must be evaluated for importance using the criteria in CEQA Guidelines 15064.5(a)(3)A-D. Generally, a lead agency must consider a cultural resource to be "historically significant" if the resource meets the significance criteria for listing in the California Register of Historical Resources. CEQA considers cultural resources that meet these criteria "historical resources."

CEQA Guidelines Section 15064.5(b) states that "…a project that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment." As defined in CEQA Guidelines Section 15064.5(b), substantial adverse change in the significance of an historical resource means physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired.

Impact Discussion:

a. **Less than significant.** As discussed above, the CCIC records search did not identify any previously recorded historical resources within the study area. The built environment at the Elks Unocal Event Center is less than 45 years old and therefore does not warrant evaluation as a historical resource. The proposed project would not require physical demolition, destruction, relocation, or alteration of this built environment resource. Therefore, the proposed project would result in no impact to historical resources (Attachment 5).

b. **Less than significant with mitigation.** As discussed under *Existing Setting*, no archaeological resources were previously recorded within the study area. One unmodified Pismo clam shell fragment was observed within the study area during the pedestrian survey. Given the distance to the Pacific Ocean (the presumed origin of the shell fragment) and scarcity of the find, it is likely that the single Pismo clam shell fragment does not represent archaeological remains reflecting prehistoric use of the area. Nonetheless, it is possible that previously-unidentified archaeological resources may be encountered during ground-disturbing activities associated with construction of the proposed project (e.g., grading or any other activity that disturbs the surface of the ground). Construction activities may result in the destruction, damage, or loss of undiscovered scientifically-important archaeological resources. However, as part of the County's conditions of approval for the proposed project, the County would require the construction contractor to implement the County's Standard Condition CulRes-09, Stop Work at Encounter, which would require construction workers to stop or redirect work immediately in the event archaeological resources are encountered during grading, construction, or other construction-related activity. The contractor would immediately contact the County and retain a County-qualified archaeologist and Native American representative to evaluate the significance of the find in compliance with the County's Standard Conditions CulRes-01, -05, -07, -08, -09, and/or -10 of the County Archaeological Guidelines, as necessary. If the discovery proves to be significant under CEQA and avoidance of impacts to the resource is not feasible, the resource shall be subject to a Phase 3 mitigation program consistent with the County Archaeological Guidelines. The mitigation program may include, but shall not be limited to, data recovery and curation of non-burial related artifacts within a qualified institution within Santa Barbara County (such as the University of California, Santa Barbara's Department of Anthropology). With implementation of the County's Standard Conditions typical for a construction project, impacts would be less than significant.

c. **No impact.** No evidence of human remains has been encountered within the study area, and no cultural resources have been identified within the study area. Should human remains be discovered during project construction, the construction contractor(s) would be required to comply with State Health and Safety Code Section 7050.5, which requires no further disturbance occur until the County Coroner has made the necessary findings as to origin and disposition pursuant to Public Resources Code Section 5097.98. Therefore, the proposed project would have no impact to human remains.

d. **No impact.** Native American consultation efforts were completed by the County pursuant to the requirements Assembly Bill 52 and Senate Bill 18. These efforts did not identify specific tribal cultural resources within the study area, and the Native American Heritage Commission indicated that there are no known sacred lands in the project vicinity. Although not related to Assembly Bill 52 or Senate Bill 18 consultation, it is noted that the Santa Ynez Band of Chumash Indians commented on the Draft IS-MND. The County met with the Santa Ynez Band of Chumash Indians on June 3, 2020 to discuss the tribe's concerns, which were addressed by the cultural resources mitigation measures included in the Draft IS-MND. Therefore, the proposed project would have no impact to tribal cultural resources.

Cumulative Impacts:

With implementation of the County's Standard Conditions typical for a construction project, the project would result in less-than-significant impacts to cultural resources. Cumulative development in the community of Orcutt, the city of Santa Maria, and Key Site 33 includes 1,122 new residential units, 402,702 square feet of commercial/office/industrial space, 240 motel rooms, and the SMJUHSD Agricultural Education and Career Technical Center, all of which are currently proposed, in process, approved, and/or under construction. Buildout of the Orcutt and Santa Maria area would continue to urbanize this area and could result in additional impacts to cultural resources, including historical resources and previously-unidentified archaeological resources. The Orcutt Community Plan EIR (County of Santa Barbara 1994) identified potentially significant impacts to historic resources resulting from Orcutt Community Plan buildout due to construction of structures, roadways, utility lines, and parks on historic sites. The Orcutt Community Plan EIR also identified potentially significant impacts to archaeological resources resulting from Orcutt Community Plan buildout due to destruction of pre-historic resources resulting from surface and subsurface grading, as well as increased incidents of pilferage and vandalism. The potential cultural resources impacts of each project would be addressed on a case-by-case basis as individual projects are reviewed by County decision-makers. Implementation of County policies and development standards related to historic and archaeological resources such as Orcutt Community Plan Policies OT-O-1, HA-O-1, and HA-O-2 and Comprehensive Plan Land Use Element Historical and Archaeological Sites Policies #1 through 5 would minimize these potential cumulative impacts. Therefore, cumulative cultural resources impacts would be potentially significant, but the project's contribution to such impacts would not be considerable and would therefore be less than significant.

Mitigation and Residual Impact:

No significant impacts were identified; therefore, mitigation is not required.

4.6 ENERGY

Will the proposal result in:	Poten. Signif.	Less than Signif. with Mitigation	Less Than Signif.	No Impact	Reviewed Under Previous Document
a. Substantial increase in demand, especially during peak periods, upon existing sources of energy?				✓	
b. Requirement for the development or extension of new sources of energy?				✓	

Existing Setting:

Pacific Gas and Electric Company ~~Southern California Edison~~ and Southern California Gas provide electric and natural gas services, respectively, to the study area. Currently, several streetlights are located within the County and Caltrans rights-of-way along Union Valley Parkway and U.S. Highway 101, as well as on the Elks Unocal Event Center property. No existing transportation facilities within the study area require use of natural gas. Motor vehicle fuels such as gasoline and diesel are consumed by vehicles traveling along U.S. Highway 101, Union Valley Parkway, Rodeo Drive, and Morningside Drive.

County Environmental Thresholds:

The County Environmental Thresholds (2018a) does not contain significance thresholds for energy impacts. Therefore, this analysis is based on the two questions in the table above, as well as the following checklist questions from Appendix G of the CEQA Guidelines:

1. Would the project result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?
2. Would the project conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

Impact Discussion:

a, b. **No impact.** The following subsections discuss energy consumption by project construction and operation.

Short-term Construction Energy Demand

Project construction would require energy resources primarily in the form of fuel consumption to operate heavy equipment, light-duty vehicles, machinery, and generators. Temporary grid power may also be provided to construction trailers or electric construction equipment. CalEEMod version 2016.3.2 was used to estimate energy demand based on project data, locally-appropriate industry-standard assumptions, and CalEEMod default values for projects in Santa Barbara County when project specifics were not known (see Section 4.3a, *Air Quality*, for modeling assumptions). Table 7 summarizes the anticipated energy consumption from construction equipment and vehicles, including construction worker trips to and from the project site. As shown therein, construction of the project would require approximately 669 gallons of gasoline and 29,682 gallons of diesel fuel. Energy use during construction would be temporary in nature, and construction equipment used would be typical of similar-sized construction projects in the region. Furthermore, in the interest of cost efficiency, construction contractors would not utilize fuel in a manner that is wasteful or unnecessary. Therefore, project construction would not result in potentially significant environmental effects due to the wasteful, inefficient, or unnecessary consumption of energy. In addition, due to its temporary and short-term nature, project construction would not result in a substantial increase in demand upon existing sources of energy or require the development or extension of new sources of energy. As such, no impact would occur.

Table 7 Anticipated Proposed Project Construction Energy Use

Source	Fuel Consumption (Gallons)	
	Gasoline	Diesel
Construction Equipment and Hauling Trips	–	51,664
Construction Worker Vehicle Trips	1,089	–
See Attachment 2 for CalEEMod default values for fleet mix and average distance of travel, and Attachment 6 for energy calculation sheets.		

Long-term Operational Energy Demand

Upon completion, the project itself would not result in direct consumption of energy. The purpose of the project is to provide a second point of access, decrease traffic congestion, and improve safety and emergency vehicle access. As such, the project would not directly generate additional vehicular trips. Decreased traffic congestion would result in less wasteful and unnecessary vehicle fuel consumption, because vehicles would not be idling in heavy traffic conditions. In addition, new local transportation connections typically lead to shorter trip distances, which would reduce unnecessary fuel consumption. For example, vehicles traveling to the Elks Unocal Event Center from the south currently must travel north past their destination to the U.S. Highway 101/Santa Maria Way interchange, then travel south on Rodeo Drive to access the Elks Unocal Event Center. With implementation of the proposed project, vehicles traveling from the south would be able access the Elks Unocal Event Center directly from the new local road connection, thereby precluding the need to travel north to the U.S. Highway 101/Santa Maria Way interchange and reducing trip distances. Therefore, project operation would not result in potentially significant environmental effects due to the wasteful, inefficient, or unnecessary consumption of energy. Furthermore, project operation would not result in a substantial increase in demand upon existing sources of energy or require the development or extension of new sources of energy. In addition, because the project would result in a net reduction in regional energy demand, the project would not conflict with any state or local plans for renewable energy and energy efficiency, such as the County's ECAP (2015).

Cumulative Impacts:

Because the proposed project would have no impacts on energy resources, the proposed project combined with cumulative development would not contribute to cumulative impacts on the regional demand for energy.

Mitigation and Residual Impact:

No significant impacts were identified; therefore, mitigation is not required.

4.7 FIRE PROTECTION

Will the proposal result in:	Poten. Signif.	Less than Signif. with Mitigation	Less Than Signif.	No Impact	Reviewed Under Previous Document
a. Introduction of development into an existing high fire hazard area?				✓	
b. Project-caused high fire hazard?				✓	
c. Introduction of development into an area without adequate water pressure, fire hydrants or adequate access for firefighting?				✓	
d. Introduction of development that will hamper fire prevention techniques such as controlled burns or backfiring in high fire hazard areas?				✓	
e. Development of structures beyond safe Fire Dept. response time?				✓	

Existing Setting:

The California Department of Forestry and Fire Protection (CAL FIRE) does not identify the study area or vicinity as being located in a Very High Fire Hazard Severity Zone (CAL FIRE 2008). The closest fire station is the Santa Barbara County Fire Station #22, located at 1600 Tiffany Park Court, approximately two miles southwest of the study area.

Predictions about the long-term effects of climate change in California include increased incidence of wildfires and a longer fire season, due to drier conditions and warmer temperatures. Any increase in the number or severity of wildfires has the potential to impact resources to fight fires when they occur, particularly when the state experiences several wildfires simultaneously. Such circumstances place greater risk on development in high fire hazard areas.

Impact Discussion:

a-e. **No impact.** The proposed project would result in a future local road connection between the Union Valley Parkway/U.S. Highway 101 interchange and the adjoining frontage road (Rodeo Drive) on the east side of U.S. Highway 101. It would not involve the construction of habitable structures and would not indirectly lead to the building of any such structures. Therefore, the proposed project would not increase the exposure of the public to increased fire hazard and would not introduce development of structures beyond safe County Fire Department response time. The proposed project would not include any ignition sources that could potentially result in a fire hazard. The proposed project also would not require or hamper fire prevention activity or infrastructure; conversely, the proposed project would ultimately result in improved emergency access to the east side of U.S. Highway 101 within the vicinity of the study area. Additionally, the Elks Unocal Event Center will continue to be available to the U.S. Forest Service and local fire departments for staging during large wildfires and the proposed project would improve access to the staging area. No impact would occur.

Cumulative Impacts:

Implementation of the proposed project is not anticipated to result in any substantial change to the study area that would affect the level of fire hazards. In addition, any future roadway connections or improvements under the proposed project would ultimately result in improved emergency access to the east of U.S. Highway 101 within the vicinity of the study area. Thus, the proposed project would not contribute to cumulative impacts to fire protection.

Mitigation and Residual Impact:

No significant impacts were identified; therefore, mitigation is not required.

4.8 GEOLOGIC PROCESSES

Will the proposal result in:	Poten. Signif.	Less than Signif. with Mitigation	Less Than Signif.	No Impact	Reviewed Under Previous Document
a. Exposure to or production of unstable earth conditions such as landslides, earthquakes, liquefaction, soil creep, mudslides, ground failure (including expansive, compressible, collapsible soils), or similar hazards?			✓		
b. Disruption, displacement, compaction or overcovering of the soil by cuts, fills or extensive grading?			✓		
c. Exposure to or production of permanent changes in topography, such as bluff retreat or sea level rise?				✓	
d. The destruction, covering or modification of any unique geologic, paleontologic or physical features?			✓		
e. Any increase in wind or water erosion of soils, either on or off the site?			✓		
f. Changes in deposition or erosion of beach sands or dunes, or changes in siltation, deposition or erosion which may modify the channel of a river, or stream, or the bed of the ocean, or any bay, inlet or lake?				✓	
g. The placement of septic disposal systems in impermeable soils with severe constraints to disposal of liquid effluent?				✓	
h. Extraction of mineral or ore?				✓	
i. Excessive grading on slopes of over 20%?				✓	
j. Sand or gravel removal or loss of topsoil?			✓		
k. Vibrations, from short-term construction or long-term operation, which may affect adjoining areas?				✓	
l. Excessive spoils, tailings or over-burden?			✓		

Existing Setting:

The study area is situated within the Santa Maria Basin, north of the Santa Ynez Mountains, and north-northwest of the Santa Ynez River Valley in the southern Coast Ranges, one of eleven major geomorphic provinces in California (California Geological Survey 2002; Isaacs 1987). The geology of the study area was mapped by Dibblee and Ehrenspeck (1989) and Tennyson (1992) and is immediately underlain by younger Quaternary (Holocene) dune sand deposits (Qos, Qd). Formed by the prevailing northwesterly winds, these Quaternary sand deposits were deposited during the Holocene to latest Pleistocene epochs and are comprised of weakly-consolidated, well-sorted fine sand. According to Woodring (1950), three age sets of dunes (old, intermediate, and modern) are present within the Santa Maria Basin, creating generally parallel belts succeeding one another inland in order of increasing age. The modern dune deposits are considered active and are bare or have sparse, scattered vegetation. The intermediate dunes are moderately-anchored by vegetation and are perfectly preserved. Overlapped by the intermediate and modern dunes, the old dunes are anchored by vegetation and are mostly poorly-preserved. These older dune deposits are the most extensive of the three groups, because they also consist of deposits derived from Orcutt Sand.

The Pleistocene Orcutt Sand deposits are not mapped at the surface of the study area, but they are present at moderate depth beneath the older Quaternary dune deposits and are mapped at ground surface at higher elevations south of the study area. The Pleistocene Orcutt Sand deposits are composed of poorly sorted marine terrace sand and gravel with deposits of tan to brown eolian wind-blown sand, silty clay, and marl.

Seismic and Geologic Hazards

The study area is located in a seismically active region and is subject to shaking from both local and distant earthquakes. The nearest active fault is the northwest-southeast trending Santa Maria Fault, located approximately 1.5 miles east of the study area (United States Geological Survey 2019a). No Alquist-Priolo fault hazard areas exist on or near the study area (California Department of Conservation 2019a). According to the County's Safety Element, the study area is located within an area rated as "low to moderate" on the geological problems index. The study area has low potential to experience liquefaction, soil creep, slope instability/landslides, and expansive soils and moderate potential to experience seismic tectonic activity, high groundwater levels, and compressible and/or collapsible soils (County of Santa Barbara 2015c).

Paleontological Sensitivity

The paleontological sensitivity of the geologic units that underlie the study area was evaluated using the results of a paleontological locality search and review of existing information in the scientific literature concerning known fossils within those geologic units. Rincon examined fossil collections records from the University of California Museum of Paleontology (UCMP) online database, which contains known fossil localities in Santa Barbara County.

Following the literature review, a paleontological sensitivity classification was assigned to the geologic units within the study area. The potential for impacts to significant paleontological resources is based on the potential for ground disturbance to directly impact paleontologically-sensitive geologic units. The Society of Vertebrate Paleontology (SVP) (2010) has developed a system for assessing paleontological sensitivity and classifies sedimentary rock units as having high, low, undetermined, or no potential for containing scientifically significant nonrenewable paleontological resources. This criterion is based on rock units within which vertebrate or significant invertebrate fossils have been determined by previous studies to be present or likely to be present.

Quaternary dune sand deposits (Qos, Qd) mapped at the surface of the study area have been assigned a low paleontological sensitivity because Holocene sedimentary deposits, particularly those younger than 5,000 years old, are generally too young to contain fossilized material. In addition, no fossils have been reported from these dune sand deposits (Woodring 1950; UCMP 2019). However, the Quaternary dune sand deposits are likely underlain by Pleistocene Orcutt Sand deposits (Qo) at a depth of approximately 10 feet below ground surface. As the oldest and most extensive terrace deposits in the vicinity, the Pleistocene Orcutt Sand has yielded several invertebrate fossil specimens near the study area, including specimens of fresh-water mollusk and ostracod. The Pleistocene Orcutt Sand has also produced an incomplete femur of a camelid (*Camelops*) and a tapir tooth that was collected along Corralitos Canyon, approximately 10 miles northwest of the study area (Woodring 1950). Therefore, the Pleistocene Orcutt Sand deposits are assigned a high paleontological resource potential.

County Environmental Thresholds:

Pursuant to the County Environmental Thresholds (2018a), impacts related to geological resources may have the potential to be significant if the project involves any of the following characteristics:

1. The study area or any part of the project is located on land having substantial geologic constraints, as determined by the Planning and Development Department or the Public Works Department. Areas constrained by geology include parcels located near active or potentially active faults and property underlain by rock types associated with compressible/collapsible soils or susceptible to landslides or severe erosion. "Special Problems" areas designated by the Board of Supervisors have been established based on geologic constraints, flood hazards and other physical limitations to development.
2. The project results in potentially hazardous geologic conditions such as the construction of cut slopes exceeding a grade of 1.5 horizontal to 1 vertical.

3. The project proposes construction of a cut slope over 15 feet in height as measured from the lowest finished grade.
4. The project is located on slopes exceeding 20 percent grade.

Impact Discussion:

a. **Less than significant.** No major faults traverse the study area and no Alquist-Priolo fault zones exist on or near the study area. Therefore, the risk of ground surface rupture and related hazards in the study area is low. Nonetheless, the study area is in a seismically active region and is subject to shaking from both local and distant earthquakes. In addition, the study area has moderate potential to experience high groundwater levels and compressible and/or collapsible soils.

   The proposed project would result in a future local road connection between the Union Valley Parkway/U.S. Highway 101 interchange and the adjoining frontage road (Rodeo Drive) on the east side of U.S. Highway 101. As previously stated, the study area is located within an area rated as "low to moderate" on the geological problems index. The study area also has low potential to experience liquefaction, soil creep, slope instability/landslides, and expansive soils and moderate potential to experience seismic tectonic activity, high groundwater levels, and compressible and/or collapsible soils (County of Santa Barbara 2015c). Although the proposed project may be exposed to fault rupture, the future local roadway connection would not increase the potential for fault rupture and related hazards, such as landslides, liquefaction, soil creep, mudslides, ground failure (including expansive, compressible, collapsible soils), or similar hazards, to occur. In addition, the future roadway would be constructed in accordance with mandatory federal, State, and local laws, policies, regulations, and engineering/construction codes that guide the design of roadway facilities. Therefore, impacts related to unstable earth conditions under the proposed project would be less than significant.

b. **Less than significant.** The proposed project would result in a future local road connection between the Union Valley Parkway/U.S. Highway 101 interchange and Rodeo Drive on the east side of U.S. Highway 101. The proposed project would require approximately 42,000 cubic yards of soil export. Although it may cause disruption, displacement, compaction, or overcovering of existing soils on the study area by cuts, fills, or grading, such earthwork would not be extensive, and any impacts from such construction activities would not be significant. In addition, the future roadway would be constructed in accordance with mandatory federal, State, and local laws, policies, regulations, and engineering/construction codes that guide the design of roadway facilities. Therefore, impacts related to the proposed project would be less than significant.

c. **No impact.** The study area is located approximately 12 miles inland from the Pacific Ocean and implementation of the proposed project would not increase public exposure to bluff retreat or sea level rise. There would be some localized changes in topography associated with the future local road connection between the Union Valley Parkway/U.S. Highway 101 interchange and Rodeo Drive on the east side of U.S. Highway 101; however, no substantial changes to topography would occur. No impact would occur.

d. **Less than significant with mitigation.** As previously stated, surface geology within the study area consists of Quaternary dune sand deposits (Qos, Qd) deposits. Such geologic deposits are not considered unique. In addition, the study area does not contain any physical features, such as rock outcroppings, that are considered unique.

   As discussed under *Existing Setting*, Quaternary dune sand deposits mapped at the surface of the study area have been assigned a low paleontological sensitivity. However, the Quaternary dune sand deposits are likely underlain by Pleistocene Orcutt Sand deposits (Qo) at a depth of approximately 10 feet below ground surface, and the Pleistocene Orcutt Sand deposits are assigned a high paleontological resource potential. Project ground disturbance associated with the future local road connection would be minimal and would not likely extend to a depth of 10 feet. Given that potential fossiliferous deposits occur at greater depths than the anticipated project disturbance, the potential for encountering fossil resources during project construction would be low. Therefore, impacts would be less than significant.

e. **Less than significant.** The majority of the study area is currently undeveloped land covered primarily with low-lying vegetation (e.g., shrubs and grasses). The proposed project would not involve substantial hillside grading. Potential erosion associated with stormwater flows during the future construction of the proposed project would be adequately addressed by the County's standard erosion control and drainage requirements (see Section 4.15, *Water Resources/Flooding*). In addition, the future roadway would be constructed in accordance with mandatory federal, State, and local laws, policies, regulations, measures, and engineering/construction codes that guide the construction of roadway facilities to ensure no significant impacts to water quality due to potential soil erosion during construction activities or operation of the future roadway. Such measures would include implementation of a project-specific Stormwater Pollution Prevention Plan (SWPPP) that would address erosion and sediment discharge during construction. Upon completion, the proposed project would not increase the potential for erosion because paved surfaces would cover and protect underlying soil and existing stormwater runoff patterns would be preserved through drainage improvements. Therefore, impacts related to the proposed project would be less than significant.

f. **No impact.** The study area is located approximately 12 miles inland from the Pacific Ocean and there are no nearby surface water bodies. As a result, the proposed project would not result in deposition or erosion of beach sands or dunes or changes in siltation, deposition, or erosion that may modify surface water bodies. No impact would occur.

g. **No impact.** The proposed project would not include septic disposal systems. No impact would occur.

h. **No impact.** The proposed project would not include the extraction of mineral or ore. No such activities currently occur on the study area. No impact would occur.

i. **No impact.** The study area does not contain slopes exceeding 20 percent that could potentially be impacted by the future roadway connector under the proposed project, and the proposed project would not include excessive grading. No impact would occur.

j. **Less than significant.** The proposed project would not involve sand or gravel removal. Potential soil erosion associated with stormwater flows during the future construction of the proposed project would be adequately addressed by the County's standard erosion control and drainage requirements (see Section 4.15, *Water Resources/Flooding*). In addition, the future roadway would be constructed in accordance with mandatory federal, State, and local laws, policies, regulations, measures, and engineering/construction codes that guide the construction of roadway facilities to ensure no significant impacts to water quality due to soil erosion during construction activities or operation of the future roadway. Such measures would include implementation of a project-specific SWPPP and water quality management plan. Nonetheless, construction of the proposed project would result in the loss of topsoil along the future roadway alignment. Due to the relatively small area to be affected, this impact would be less than significant. Once operational, the future roadway under the proposed project would not involve any activities that would result in the loss of topsoil. This impact would be less than significant.

k. **No impact.** The future construction of the proposed project would involve heavy equipment during construction and demolition that would create vibration, such as the vibratory roller to be used for paving. No vibration-sensitive receptors exist in the vicinity of the study area because the area is surrounded by agricultural land and U.S. Highway 101, which are not considered vibration-sensitive. Once operational, the future roadway related to the proposed project would not involve any activities that would generate vibration. As a result, no vibration impact would occur.

l. **Less than significant.** The study area is located within an area rated as "low to moderate" on the geological problems index (County of Santa Barbara 2015c). The proposed project would require excavation and contouring, such earthwork would not require substantial excavation or substantial import/export of soils, and no excessive spoils, tailings, or over-burden would occur. The proposed project would require approximately 42,000 cubic yards of soil export. In addition, the future roadway would be constructed in accordance with mandatory federal, State, and local laws, policies, regulations, and engineering/construction codes that guide the design and construction of roadway facilities. Therefore, impacts related to spoils, tailings, or over-burden under the proposed project would be less than significant.

Cumulative Impacts:

Since the proposed project would not result in significant geologic impacts and geologic impacts are typically localized in nature, impacts on geologic hazards under the proposed project would not be cumulatively considerable.

Mitigation and Residual Impact:

No significant impacts were identified; therefore, mitigation is not required.

4.9 HAZARDOUS MATERIALS/RISK OF UPSET

Will the proposal result in:	Poten. Signif.	Less than Signif. with Mitigation	Less Than Signif.	No Impact	Reviewed Under Previous Document
a. In the known history of this property, have there been any past uses, storage or discharge of hazardous materials (e.g., fuel or oil stored in underground tanks, pesticides, solvents or other chemicals)?		✓			
b. The use, storage or distribution of hazardous or toxic materials?				✓	
c. A risk of an explosion or the release of hazardous substances (e.g., oil, gas, biocides, bacteria, pesticides, chemicals or radiation) in the event of an accident or upset conditions?				✓	
d. Possible interference with an emergency response plan or an emergency evacuation plan?			✓		
e. The creation of a potential public health hazard?		✓			
f. Public safety hazards (e.g., due to development near chemical or industrial activity, producing oil wells, toxic disposal sites, etc.)?				✓	
g. Exposure to hazards from oil or gas pipelines or oil well facilities?				✓	
h. The contamination of a public water supply?				✓	

Existing Setting:

Based on review of the GeoTracker (State Water Resources Control Board 2019a), EnviroStor (California Department of Toxic Substances Control 2019) and EnviroMapper for Envirofacts (United States Environmental Protection Agency 2019) databases, no active hazardous material sites or leaking underground storage tanks are located in the study area. According to GeoTracker, the study area is within 1,000 feet of three properties formerly or currently enrolled in the Irrigated Lands Regulatory Program, a State program that regulates discharges associated with commercial agricultural operations to reduce potential impacts to water bodies. The program covers approximately 40,000 growers and six million acres throughout California and requires monitoring and reporting of agricultural inputs, including fertilizers and pesticides (State Water Resources Control Board 2019b). In addition, the Santa Maria Way/U.S. Highway 101 interchange is a former cleanup program site for a FedEx semi-trailer truck wreck, which was closed as of March 24, 2010 (State Water Resources Control Board 2019a).

County Environmental Thresholds:

The County's safety threshold addresses involuntary public exposure from projects involving significant quantities of hazardous materials. The threshold addresses the likelihood and severity of potential accidents to determine whether the safety risks of a project exceed significant levels.

Impact Discussion:

a, e. **Less than significant with mitigation.** Parcels within and adjacent to the study area have historically been and/or are currently being used for agricultural purposes; therefore, it is possible that residual pesticides may be found in soils within the study area. In addition, due to the study area's proximity to U.S. Highway 101, on-site soils likely contain aerially-deposited lead generated by the combustion of leaded gasoline by vehicles traveling along the highway.

Pesticides from historic and/or current use and aerially-deposited lead may be mobilized in the form of fugitive dust during project grading and could pose a health hazard to project construction workers and employees working on adjacent agricultural lands. Given the current and/or historical agricultural use of portions of the study area, as well as the presence of a highway through the study area (thus, likely containing aerially-deposited lead in on-site soils), hazardous materials could be encountered during ground-disturbing construction activities. Such materials could pose a threat to construction workers, the public, and/or the environment if not properly managed, transported, and disposed, which could result in a potentially significant impact. With implementation of Mitigation Measures H-01 and H-02 (see below), which require a soil assessment and a Contaminated Soil Contingency Plan for proper disposal of contaminated soils, if identified, the potential impact would be reduced to a less-than-significant level. Therefore, impacts would be less than significant with mitigation.

b. **Less than significant.** Other than fuels used temporarily by construction equipment and vehicles, future construction of the proposed project would not involve the use, storage, or distribution of hazardous or toxic materials. Furthermore, the proposed project would not involve the storage or use of any chemicals, fuels, or other materials that could expose people to a substantial hazard. This impact would be less than significant.

c. **No impact.** Other than fuels used temporarily by construction equipment and vehicles, future construction and operation of the proposed project would not involve the use, storage, or distribution of hazardous or toxic materials. The proposed project would not increase the potential for accidents or upset conditions to result in the exposure of the public to hazardous materials. No impact would occur.

d. **Less than significant.** The proposed project would involve a future local road connection and would improve emergency access to the east side of U.S. Highway 101 in the study area. Full road closures of U.S. Highway 101 and Union Valley Parkway would not be required, although full closure of the southernmost segment of Rodeo Drive during construction may be required. At this location, Rodeo Drive only provides access to local and private access roadways for agricultural parcels; therefore, closure of this road would not significantly impede emergency access in this area. Impacts would be less than significant.

f, g. **No impact.** The proposed project would not include any new development near land uses that rely on the use of hazardous materials, such as chemical or industrial activity, producing oil wells, or toxic disposal sites. Furthermore, no oil or gas wells, other oil production facilities, or oil or gas pipelines are located on or adjacent to the study area. Based on the California Department of Conservation Well Finder application, the nearest recorded oil well is a plugged core hole located approximately 0.25 mile to the south (California Department of Conservation 2019b). No impact would occur.

h. **No impact.** Future construction activities for the proposed project would not involve the use, storage, or uncovering of hazardous materials, and thus, would not result in any potential impact to the quality of public water supplies. No impact would occur.

Cumulative Impacts:

Implementation of the proposed project could potentially result in significant impacts related to hazardous materials during construction. In the event that contaminated soil is present in the study area and could be disturbed during construction, Mitigation Measures H-01 and H-02 would reduce related potential impacts to less than significant. Any future roadway connections or improvements under the proposed project would improve access for emergency services to the east of U.S. Highway 101 in the study area after construction is completed. The proposed project would also comply with applicable federal, State, and local laws and regulations regarding hazardous materials. Therefore, impacts associated with hazardous materials/risk of upset from the proposed project would not be cumulatively considerable.

Mitigation and Residual Impact:

The proposed project could result in a potentially significant impact if hazardous materials are encountered during ground-disturbing construction activities. With implementation of Mitigation Measures H-01 and H-02, the potential impact would be reduced to a less-than-significant level:

MM H-01 **Soil Sampling and Disposal:** Prior to construction, a soil assessment shall be completed under the supervision of a professional geologist or professional engineer. If soil sampling indicates the presence of any contaminant in quantities not in compliance with applicable laws, the California Regional Water Quality Control Board (RWQCB) or the California Department of Toxic Substances Control shall be contacted to determine proper disposal requirements. If required based on the levels of contamination in the study area soil, proper removal and disposal of contaminated soils removed during excavation and trenching activities shall be performed.

PLAN REQUIREMENTS: These requirements shall be noted in plan specifications.

TIMING: The soil assessment shall be verified by the County prior to commencement of construction.

MONITORING: The County shall ensure measures are included on plans. The County shall spot check and ensure compliance on site.

MM H-02 **Contaminated Soil Contingency Plan:** If contaminated soils will be disturbed during project construction, the construction contractor shall develop and implement a Contaminated Soil Contingency Plan to handle treatment and/or disposal of contaminated soils.

PLAN REQUIREMENTS: The requirements of the Contaminated Soil Contingency Plan shall be noted in plan specifications.

TIMING: If contaminated soil is encountered during project construction, work shall halt and an assessment made to determine the extent of contamination. Treatment and/or disposal of contaminated soils shall be conducted in accordance with the Contingency Plan.

MONITORING: The County shall perform periodic site inspections to ensure compliance with these requirements.

4.10 LAND USE

Will the proposal result in:	**Poten. Signif.**	**Less than Signif. with Mitigation**	**Less Than Signif.**	**No Impact**	**Reviewed Under Previous Document**
a. Structures and/or land use incompatible with existing land use?				✓	
b. Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?		✓			
c. The induction of substantial growth or concentration of population?			✓		
d. The extension of sewer trunk lines or access roads with capacity to serve new development beyond this proposed project?			✓		
e. Loss of existing affordable dwellings through demolition, conversion or removal?				✓	
f. Displacement of substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?				✓	
g. Displacement of substantial numbers of people, necessitating the construction of replacement housing elsewhere?				✓	
h. The loss of a substantial amount of open space?				✓	
i. An economic or social effect that would result in a physical change? (i.e. Closure of a freeway ramp results in isolation of an area, businesses located in the vicinity close, neighborhood degenerates, and buildings deteriorate. Or, if construction of new freeway divides an existing community, the construction would be the physical change, but the economic/social effect on the community would be the basis for determining that the physical change would be significant.)				✓	
j. Conflicts with adopted airport safety zones?				✓	

Existing Setting:

The study area currently contains the northbound lanes of U.S. Highway 101, the eastern cul-de-sac terminus of Union Valley Parkway, the northbound U.S. Highway 101 on- and off-ramps for Union Valley Parkway, Rodeo Drive (a two-lane frontage road), a private easement that continues at the southern terminus of Rodeo Drive, and a portion of Morningside Drive (a gated private road), all of which are paved roadways. The remainder of the study area consists of active agricultural land, a portion of the western part of the Elks Unocal Event Center, fallow agricultural land, and a Caltrans-owned detention basin for stormwater runoff, located just north of Union Valley Parkway to the east of U.S. Highway 101. To the west of the study area is U.S. Highway 101; to the north are commercial and agricultural land uses and the new SMJUHSD Agricultural Education and Career Technical Center (under construction); and to the south are agricultural land uses. To the east are the Elks Unocal Event Center and parcels zoned for agricultural land uses.

County Environmental Thresholds:

The County Environmental Thresholds (2018a) contains no specific thresholds for land use. Generally, a potentially significant impact can occur if a project would result in substantial growth-inducing effects or result in a physical change in conflict with County policies adopted for the purpose of avoiding or mitigating an environmental effect.

Impact Discussion:

a. **No impact**. The proposed project is a future local road connection that would be constructed adjacent to the U.S. Highway 101 corridor and would be similar and generally indistinguishable from the existing frontage road, Rodeo Drive. The project would serve the Elks Unocal Event Center and other existing land uses; it would not introduce new land uses. The proposed project is intended to improve access to the east side of U.S. Highway 101 and is compatible with surrounding land uses. Therefore, no impact would occur.

b. **Less than significant with mitigation**. As discussed in the following subsections, with the implementation of mitigation measures, the proposed project would be consistent with all plans, policies, and regulations adopted for the purpose of mitigating an environmental effect, including the County's Comprehensive Plan and the Orcutt Community Plan. The project would be designed in accordance with the County's Engineering Design Standards and reviewed by the County Public Works Department for conformance.

Agricultural Resources

As discussed in Section 4.2, *Agricultural Resources*, the proposed project would impact portions of five parcels zoned Agriculture II (AG-II).Two parcels are not suitable for agriculture due to size and current use and two parcels have relatively low agricultural suitability and productivity. APN 107-240-008 supports irrigated agriculture and is large enough to qualify for the County Agricultural Preserve Program. The proposed project would be located on Grazing Land, except for an approximately 80-foot segment (approximately 0.07 acre, or 3,050 square feet) on APN 107-240-008 classified as Farmland of Statewide Importance. However, converting the 0.07 acres of land to non-agricultural use would have little or no effect on agricultural production or viability, and the remainder of APN 107-240-008 would remain in crop production. Therefore, the proposed project would not convert prime agricultural soil to non-agricultural use, impair agricultural land or productivity, or conflict with agricultural preserve programs. Therefore, the project would be consistent with Policy LUA-O-2 of the Orcutt Community Plan and Goal I, Policy IA, Goal II, Policy II.D, and Goal III of the Agricultural Element of the Comprehensive Plan.

Air Quality

As discussed in Section 4.3a, *Air Quality*, the proposed project would decrease existing traffic congestion and would not directly induce additional vehicular trip generation. As a result, the proposed project would decrease air pollutant emissions from mobile sources as compared to baseline conditions and would therefore be consistent with Policy AQ-O-1. In addition, project construction activities would be subject to the County's grading ordinance to minimize fugitive dust and PM_{10} emissions and associated impacts to air quality, and the proposed project would be required to implement Mitigation Measure Air-01. Therefore, with mitigation, the proposed project would be consistent with Policy AQ-O-2 of the Orcutt Community Plan.

Biological Resources

As discussed in Section 4.4, *Biological Resources*, the proposed project may result in direct and indirect impacts to special-status wildlife species, nesting birds, and native trees. Implementation of Mitigation Measures Bio-01 through Bio-0~~7~~6 would require several measures for surveys, mapping, habitat assessments, construction monitoring, and native tree replacement, which would reduce biological resources impacts to a less-than-significant level. Therefore, with mitigation, the project would be consistent with Policy BIO-O-3, DevStd BIO-O-3.1, Policy BIO-O-4, DevStd BIO-O-4.1, Policy BIO-O-5, and DevStd BIO-O-5.1 of the Orcutt Community Plan.

Energy

As discussed in Section 4.12, *Public Facilities*, the proposed project would be required to implement Mitigation Measure SolidW-01, which includes implementation of a Source Reduction and Solid Waste Management Plan that addresses recycling and reuse of construction materials. Therefore, with mitigation, the proposed project would be consistent with Goal 4 and Policy 4.1 of the Energy Element of the Comprehensive Plan.

Flooding and Drainage

As discussed in Section 4.15, *Water Resources/Flooding*, the proposed project would include drainage improvements to flow conveyance systems to avoid ponding, prevent spread of water into travel lanes, and minimize erosion. Bioswales and water quality basins would be constructed where necessary, and existing stormwater runoff patterns would be perpetuated. The project would be constructed in accordance with mandatory federal, State, and local laws, policies, and regulations, which would require implementation of a project-specific SWPPP that would address erosion, sediment discharge, and water quality and pollution control during all phases of construction through implementation of BMPs. In addition, implementation of Mitigation Measure Wat-01 would be required to address operational impacts to water quality through implementation of a post-construction stormwater control plan. Therefore, with mitigation, the project would be consistent with Policy FLD-O-2, DevStd FLD-O-2.1, Policy FLD-O-3, DevStd FLD-O-3.1, and DevStd FLD-O-3.2 of the Orcutt Community Plan and Hillside and Watershed Protection Policies #1 through 7 of the Land Use Element of the Comprehensive Plan.

Historical and Archaeological Resources

As discussed in Section 4.5, *Cultural Resources*, the cultural resources records search did not identify any cultural resources within or near the study area and the pedestrian survey did not identify resources that indicate archaeological remains. Furthermore, the proposed project would be required to implement a standard condition of approval to stop work in the event archaeological remains are encountered during grading, construction, or other construction-related activities, which would reduce potential impacts to previously-unidentified archaeological resources to a less-than-significant level. Therefore, the proposed project would be consistent with Historical and Archaeological Sites Policies #2, 3, and 5 of the Land Use Element of the Comprehensive Plan.

Noise

As discussed in Section 4.11, *Noise*, project construction activities would potentially result in temporarily elevated noise levels in excess of the County's noise threshold of 65 CNEL at sensitive receivers to the west across U.S. Highway 101. Implementation of Mitigation Measure N-01 would restrict construction activities to standard construction working hours of 7:00 a.m. to 4:00 p.m. on weekdays and would require the use of noise attenuation measures such as barriers and mufflers to reduce construction noise to below the County's threshold. Therefore, with mitigation, the proposed project would be consistent with Policy NSE-O-2, DevStd NSE-O-2.1, and DevStd NSE-O-2.2 of the Orcutt Community Plan.

Scenic Highways

As discussed in Section 4.1, *Aesthetics/Visual Resources*, the portion of U.S. Highway 101 adjacent to the study area is labeled as a "State Masterplanned Scenic Highway (Eligible for Designation)" in the County's Scenic Highways Element (County of Santa Barbara 2009). However, the proposed project (1) would not include any features that would adversely impact valuable scenic resources such as the Sierra Madre Mountains, Casmalia Hills, or the urban fringe and (2) would not deteriorate the scenic quality of the County by impacting the scenic highway eligibility of this roadway. Therefore, the project would be consistent with the goals of the Scenic Highways Element of the Comprehensive Plan.

Seismic Safety and Safety Element

As discussed in Section 4.6, *Geologic Processes*, the proposed project would not increase the potential for fault rupture and related hazards, such as landslides, liquefaction, soil creep, mudslides, ground failure (including expansive, compressible, collapsible soils), or similar hazards to occur. In addition, the future roadway would be constructed in accordance with mandatory federal, State, and local laws, policies, regulations, and engineering/construction codes that guide the design of roadway facilities. Therefore, the proposed project would be consistent with the geologic and seismic goals and policies of the Seismic Safety and Safety Element of the Comprehensive Plan.

Visual/Aesthetic Resources

As discussed in Section 4.1, *Aesthetics/Visual Resources*, the proposed project would not result in significant impacts to scenic vistas, public view corridors, public viewsheds, or the visual character of the study area. Therefore, the project would be consistent with Policy VIS-O-2, DevStd VIS-O-2.1, and Policy VIS-O-4 of the Orcutt Community Plan.

Consistency Standards for Primary and Secondary Roadways

The future local road connection would be designed to meet County standards for a Collector Road. The Orcutt Community Plan (1997) establishes consistency standards for primary and secondary roadways, which have design capacities ranging between 7,900 to 19,900 ADT. Rodeo Drive is not currently classified in the Orcutt Community Plan. The proposed GPA would amend the Transportation subsection of the Orcutt Community Plan and the associated Orcutt Community Plan Circulation Map. The GPA would also classify Rodeo Drive as a Secondary 1 (Class S-1) roadway, which has a design capacity of 11,600 ADT and LOS C threshold capacity of 9,300 ADT. Rodeo Drive is projected to have a traffic volume of 5,700 ADT under the cumulative (2040) plus proposed project condition. Therefore, the project would be consistent with standards for secondary roadways in the Orcutt Community Plan.

Primary roadway standards would apply to Union Valley Parkway, which the Orcutt Community Plan classifies as a "Primary 2" (P-2) roadway between U.S. Highway 101 and State Route 1. The design capacity for two-lane P-2 roadways, such as Union Valley Parkway, is 17,900 ADT (County of Santa Barbara 2013). As discussed in Section 4.14, *Transportation/Circulation*, the proposed project would not cause this segment of Union Valley Parkway to exceed its design capacity under opening year (2025) conditions. However, under cumulative (2040) plus project conditions, this segment of Union Valley Parkway would reach ADT volumes of 19,800 vehicles, which would exceed its design capacity. The Orcutt Community Plan states that if the estimated future ADT volume exceeds the acceptable design capacity, then a project is consistent if intersections affected by traffic assigned from the project operate at or above minimum LOS standards (County of Santa Barbara 2013). As discussed in Section 4.14, *Transportation/Circulation*, all intersections on this segment of Union Valley Parkway are expected to operate at LOS C (i.e., the acceptable design capacity) or better under cumulative

(2040) plus project conditions during all peak hours. Therefore, the project would be consistent with the primary road standards of the Orcutt Community Plan.

Consistency Standards for Unsignalized Intersections

The Orcutt Community Plan (1997) also establishes the following consistency standards for unsignalized intersections:

- Projects contributing peak hour trips to unsignalized intersections that operate at an estimated future Level of Service (LOS) A are consistent with the Community Plan unless the project results in a change of two levels of service or an equivalent amount of delay.
- Projects contributing peak hour trips to intersections that operate better than an estimated future LOS C are consistent with the Community Plan.
- Unsignalized intersections that do not trigger traffic signal warrant criteria are consistent with the Community Plan.

As detailed in Section 4.14, *Transportation/Circulation*, and the Traffic Impact Study (Attachment 7), the proposed project would not change the LOS of any study area intersections operating at LOS A by two levels of service and would not trigger traffic signal warrant criteria.

Key Site 33 Development Standards

The study area is located within Key Site 33. Of the Key Site 33 development standards included in the Orcutt Community Plan (1997), Policy KS33-1, DevStd KS33-1, and DevStd KS33-2 would apply to the project. The project would be designed to include stormwater drainage and water quality improvements in conformance with County and Caltrans standards. Drainage improvements would include improvements to flow conveyance systems to avoid ponding, prevent spread into travel lanes, and eliminate erosion. Bioswales and water quality basins would be installed where necessary. If stormwater runoff is conveyed to off-site stormwater basins, the County Flood Control District would be required to review and approve conveyance to the basins. Therefore, the project would be consistent with Policy KS33-1, DevStd KS33-1, and DevStd KS33-2 of the Orcutt Community Plan, which address stormwater runoff and flooding.

c, d. **Less than significant impact.** A roadway improvement project can induce growth by removing existing constraints to growth (such as, eliminating congestion) or by directly promoting growth (for example, providing access to previously-inaccessible commercial or residential development sites). In assessing the potential growth inducement of a proposed project, it is important to clearly identify growth induced by the project beyond that already anticipated and planned for by local land use agencies.

The relationship between the proposed project and growth in the Santa Maria and Orcutt area is expected to be one of accommodating existing development and planned growth, rather than growth inducement. The project involves a future local road connection that would improve access to the area east of U.S. Highway 101 between the Santa Maria Way and Union Valley Parkway interchanges. As described in Section 1.2, *Project Objective*, the purpose of the project is to decrease traffic volumes and congestion and improve safety and emergency vehicle access along Santa Maria Way during large events held at the Elks Unocal Event Center. This area is currently accessible via the U.S. Highway 101/Santa Maria Way interchange and Rodeo Drive. Without the proposed project, this area would continue to experience high levels of congestion during large events at the Elks Unocal Event Center.

The proposed project would provide access to the existing pet grooming business, several undeveloped parcels zoned for highway commercial use, and the SMJUHSD Agricultural Education and Career Technical Center, which is currently under construction. However, these parcels are already accessible from the U.S. Highway 101/Santa Maria Way interchange, and given their proximity to this interchange, primary access to these parcels would continue to be provided via this interchange. In addition, the Orcutt Community Plan anticipates some growth in Key Site 33, east of U.S. Highway 101, including the Elks Unocal Event Center (currently existing), three motels with up to 80 rooms each, two drive-thru fast food restaurants, and a convenience market/gas station. The environmental impacts of this buildout of Key Site 33 were analyzed at a programmatic-level in the Final EIR for the Orcutt Community Plan (County of Santa Barbara 1994). Therefore, the proposed project would not induce growth on these parcels beyond that currently projected for the area.

As discussed in Section 3.3, *Cumulative Impacts Methodology*, Action KS33-4 of the Orcutt Community Plan states, "When a full diamond interchange (as defined by Caltrans) for Union Valley Parkway and U.S. Highway 101 is funded and timing is established, the County may consider a redesignation and a rezone of one or more of the Jantz parcels (APNs 107-240-027, -028, and -029) to Highway Commercial/CH." Commercial uses could be approved on the Jantz property, should the redesignation and rezone be approved (which is not proposed as part of the proposed project). The project would provide direct access to these parcels, which are located adjacent to the proposed roadway alignment. However, these parcels are currently zoned for agricultural use, and redesignation/rezoning of these parcels would require approval by the County and separate environmental review. In addition, commercial development on these parcels is anticipated by the Orcutt Community Plan, and is therefore considered planned, rather than induced, development.

The proposed project would not extend access from Rodeo Drive and Union Valley Parkway to lands to the east. However, the proposed project does not preclude future development to the east, and additional future road connections could be constructed to connect with the proposed project. By improving future access to lands east of the study area, the project could shift the direction of future growth toward the east. Overall, the Orcutt Community Plan generally directs future growth to the lands west of U.S. Highway 101. However, lands to the east are currently designated for agricultural and open space use but are located at the edge of an urban area that is experiencing growth pressure. Large parcels of undeveloped land near expanding urban or suburban areas are usually attractive areas for growth. The proposed project would provide new local access to this area. The area east of the study area is undeveloped, has historically been and is currently in agricultural use, and has experienced virtually no urban growth. In addition, the land east of the project study area may contain sensitive environmental resources, including agricultural lands, oil resources, and listed species whose presence would require substantial mitigation for impacts that could render development economically infeasible. In addition, utility and roadway infrastructure to support urban development is not currently in place or planned for this area. Although the proposed project would eliminate one of several obstacles to development east of the study area, the proposed project is but one step in a series of requirements that must first be realized for potential future development to commence. Some of the other required steps may include General Plan amendments, new infrastructure, and/or redesignation and rezoning of properties. Future development in the area east of the study area could place resources of concern, such as agricultural lands, listed species, and associated habitat, under greater threat for development. However, potential future development in this area would require additional project-specific environmental review and would be expected to avoid, minimize, and/or mitigate effects on these resources of concern. Therefore, the proposed project would not induce substantial growth or concentration of population, and impacts would be less than significant.

e-g. **No impact.** No dwellings adjoin or exist within the study area. Therefore, the proposed project would not displace or otherwise affect any existing dwellings or people. No impact would occur.

h. **No impact**. The study area is not designated as open space. In addition, the proposed project would result in only a minor incremental increase in paved roadway surface adjacent to the existing U.S. Highway 101 corridor. Therefore, no impact would occur.

i. **No impact.** The proposed project involves a future local road connection to improve access to the east side of U.S. Highway 101. It would be located adjacent to the U.S. Highway 101 corridor and would not divide an existing community. Therefore, the project would not result in any social or economic effects that would cause a physical change in the local community. No impact would occur.

j. **No impact**. The study area is located approximately 1.4 miles east of the Santa Maria Airport. According to the adopted Santa Barbara County Airport Land Use Plan (Santa Barbara County Association of Governments [SBCAG] 1993), the study area is located outside of the limits of the Flight Approach and Flight Clear Zones, and, therefore, is not subject to airport compatibility concerns. The project would not involve any development that would impede or be affected by aircraft overflights. The project would not conflict with airport operations or adopted airport safety zones; therefore, no impact would occur.

Cumulative Impacts:

With mitigation incorporated, implementation of the project is not anticipated to result in any substantial change to the site's conformance with environmentally protective policies and standards or have significant growth-inducing effects. Cumulative development in the community of Orcutt, the city of Santa Maria, and Key Site 33 includes 1,122 new residential units, 402,702 square feet of commercial/office/industrial space, 240 motel rooms, and the SMJUHSD Agricultural Education and Career Technical Center, all of which are currently proposed, in process, approved, or under construction. Buildout of the Orcutt and Santa Maria area would continue to urbanize these communities and result in additional loss of open space areas. The Orcutt Community Plan EIR, Case No, 95-EIR-01 (1994), identified potentially significant impacts resulting from Orcutt Community Plan buildout due to increased regional traffic, economic fiscal impacts, conversion of agricultural land, and urbanization of rural and semi-rural areas. Cumulative development in the Orcutt area would also result in short-term construction air and noise emissions, and long-term land use compatibility effects related to quality of life issues, noise and traffic nuisances, aesthetic incompatibility, and agriculture/urban conflicts. The potential land use conflicts of each project would be addressed on a case-by-case basis as individual projects are reviewed by County decision-makers. Implementation of County policies and development standards related to land use in the Orcutt Community Plan, Comprehensive Plan, and Land Use Development Code would minimize these potential cumulative impacts. Therefore, cumulative land use impacts would be less than significant.

Mitigation and Residual Impact:

The proposed project could result in a potentially significant land use impact due to impacts to biological resources, solid waste facilities, and water quality. With implementation of Mitigation Measures Bio-01 through Bio-0~~7~~6 (see Section 4.4, *Biological Resources*), SolidW-01 (see Section 4.12, *Public Facilities*), and Wat-01 (see Section 4.15, *Water Resources/Flooding*), impacts would be reduced to a less-than-significant level.

4.11 NOISE

Will the proposal result in:	Poten. Signif.	Less than Signif. with Mitigation	Less Than Signif.	No Impact	Reviewed Under Previous Document
a. Long-term exposure of people to noise levels exceeding County thresholds (e.g. locating noise sensitive uses next to an airport)?				✓	
b. Short-term exposure of people to noise levels exceeding County thresholds?		✓			
c. Project-generated substantial increase in the ambient noise levels for adjoining areas (either day or night)?				✓	

Existing Setting:

Noise Overview

Sound is a vibratory disturbance created by a moving or vibrating source, which is capable of being detected by the hearing organs (e.g., the human ear). Noise is defined as sound that is loud, unpleasant, unexpected, or undesired and may therefore be classified as a more specific group of sounds. The effects of noise on people can include general annoyance, interference with speech communication, sleep disturbance, and, in the extreme, hearing impairment (Crocker 2007).

Noise levels are commonly measured in decibels (dB) using the A-weighted sound pressure level (dBA). The A-weighting scale is an adjustment to the actual sound pressure levels so that they are consistent with the human hearing response, which is most sensitive to frequencies around 4,000 Hertz (Hz) and less sensitive to frequencies around and below 100 Hz (Kinsler 1999). Decibels are measured on a logarithmic scale that quantifies sound intensity in a manner similar to the Richter scale used to measure earthquake magnitudes. A doubling of the energy of a noise source, such as a doubling of traffic volume, would increase the noise level by 3 dB; similarly, dividing the energy in half would result in a decrease of 3 dB (Crocker 2007).

Human perception of noise has no simple correlation with acoustical energy. The perception of noise is not linear in terms of dBA or in terms of acoustical energy. Two equivalent noise sources combined do not sound twice as loud as one source. It is widely accepted that the average healthy ear can barely perceive changes of 3 dBA, increase or decrease; that a change of 5 dBA is readily perceptible; and that an increase (decrease) of 10 dBA sounds twice (half) as loud (Caltrans 2013).

The impact of noise is not a function of loudness alone. The time of day when noise occurs and the duration of the noise are also important. In addition, most noise that lasts for more than a few seconds is variable in its intensity. Consequently, a variety of noise descriptors has been developed. The noise descriptors used for this analysis are the one-hour equivalent noise level ($L_{eq[1h]}$) and the community noise equivalent level (CNEL).

- The L_{eq} is the level of a steady sound that, in a stated time period and at a stated location, has the same A-weighted sound energy as the time-varying sound. For example, Leq(1h) is the equivalent noise level over a 1-hour period and is a common metric for limiting nuisance noise.
- The CNEL is a 24-hour equivalent sound level. The CNEL calculation applies an additional 5 dBA penalty to noise occurring during evening hours (i.e., 7:00 p.m. to 10:00 p.m.) and an additional 10 dBA penalty is added to noise occurring during nighttime hours (i.e., 10:00 p.m. to 7:00 a.m.). These increases for certain times are intended to account for the added sensitivity of humans to noise during the evening and nighttime periods.

Sound from a small, localized source (approximating a "point" source) decreases or drops off at a rate of 6 dBA for each doubling of the distance from the source while sound from a line source (e.g., roadway, pipeline, railroad) typically attenuates at about 3 dBA per doubling of distance (Caltrans 2013).

Existing Noise Environment

The most prevalent source of noise in the project site vicinity is vehicular traffic on U.S. Highway 101, which runs through the westernmost portion of the study area. Ambient noise levels are generally highest during the daytime and rush hours unless congestion substantially slows speeds, which tends to reduce ambient noise levels. The Orcutt Community Plan Noise Element indicates that the study area falls within several noise level contours of U.S. Highway 101 with the westernmost area in the 70 to 74 CNEL or greater contour and the easternmost area in the 55 to 59 CNEL contour (County of Santa Barbara 2013). Other noise sources within and adjacent to the study area include vehicular traffic on Rodeo Drive, agricultural operations, and events on the Elks Unocal Event Center.

The County Environmental Thresholds (2018a) states that noise-sensitive land uses include residential dwellings, transient lodging, hospitals, educational facilities, libraries, churches, and places of public assembly. Noise-sensitive land uses near the location of the proposed project consist of single-family and multi-family residential land uses located approximately 400 feet to the west and The Children's House Montessori School. All existing sensitive land uses in the immediate area are located west of U.S. Highway 101. However, the SMJUHSD Agricultural Education and Career Technical Center, to be located approximately 750 feet east of the study area, is currently under construction and is therefore a future sensitive receiver because it will likely be occupied at the time of project construction.

County Environmental Thresholds:

Chapter 13, Noise Thresholds, of the County Environmental Thresholds (2018a) establishes the following noise thresholds:

- A proposed development that would generate noise levels in excess of 65 CNEL and could affect sensitive receivers would generally be presumed to have a significant impact.
- Outdoor living areas of noise sensitive uses that are subject to noise levels in excess of 65 CNEL would generally be presumed to be significantly impacted by ambient noise. A significant impact would also generally occur where interior noise levels cannot be reduced to 45 CNEL or less.
- A project will generally have a significant effect on the environment if it will increase substantially the ambient noise levels for noise-sensitive receivers adjoining areas. This may generally be presumed when ambient noise levels affecting sensitive receivers are increased to 65 CNEL or more. However, a significant effect may also occur when ambient noise levels affecting sensitive receivers increase substantially but remain less than 65 CNEL, as determined on a case-by-case level.
- Noise from grading and construction activity proposed within 1,600 feet of sensitive receivers, including schools, residential development, commercial lodging facilities, hospitals or care facilities, would generally result in a potentially significant impact. According to EPA guidelines, average construction noise is 95 dBA at a 50-foot distance from the source. A 6-dBA drop occurs with a doubling of the distance from the source. Therefore, locations within 1,600 feet of the construction site would be affected by noise levels over 65 dBA. To mitigate this impact, construction within 1,600 feet of sensitive receivers shall be limited to weekdays between the hours of 7~~8~~:00 a.m. to 4~~5~~:00 p.m. only. Noise attenuation barriers and muffling of grading equipment may also be required. Construction equipment generating noise levels above 95 dBA may require additional mitigation.

Impact Discussion

a, c. **No impact.** Upon completion, the project itself would not generate noise. The purpose of the project is to decrease existing traffic congestion and improve safety and emergency vehicle access. As such, the project would not directly induce additional vehicular trip generation and would not increase traffic noise on U.S. Highway 101 or Rodeo Drive. Furthermore, the project would relocate trips from U.S. Highway 101 to Rodeo Drive, which is further away from residential neighborhoods west of the study area. Although noise from vehicular traffic would increase on the parcels along the future local road connection, these parcels are zoned for agricultural use and may be re-zoned at a later time to commercial use, neither of which are considered noise-sensitive land uses. Therefore, the proposed project would not result in long-term exposure of people to noise levels exceeding County thresholds or generate a substantial increase in ambient noise levels for adjoining areas. No impact would occur.

b. **Less than significant with mitigation**. Project construction activities would occur approximately 400 feet east of sensitive receivers located to the west across U.S. Highway 101.[7] Construction activities and operation of heavy equipment (e.g., graders and bulldozers) and stationary equipment (e.g., generators) would generate short-term noise during project construction. Based on the CalEEMod modeling results (Attachment 2), maximum daily construction traffic would be approximately 71 trips, which includes 15 construction worker trips, 4 water truck trips, and 52 haul truck trips, during the grading phase. Sensitive receivers to the west are located within the 65 to 69 CNEL noise level contour for U.S. Highway 101 (County of Santa Barbara 2013); therefore, noise levels at these locations are already elevated above the County's 65 CNEL standard. Noise generated by construction traffic would not substantially increase noise levels at these receivers given that haul truck trips would represent approximately 0.1 percent of existing daily traffic volumes of approximately 55,000 vehicles on the segment of U.S. Highway 101 near the study area (Attachment 7). Nevertheless, assuming a standard distance attenuation of 6 dBA per doubling of distance, average construction noise levels of 95 dBA L_{eq} would result in noise levels of approximately 77 dBA L_{eq} at the nearest sensitive receivers located 400 feet to the west of construction activities (County of Santa Barbara 2018a). Therefore, construction noise could contribute to the existing exceedance of the County's 65 CNEL noise threshold, especially if construction activities occur during times when sensitive receivers west of U.S. Highway 101 experience lower ambient noise levels (e.g., evening and nighttime). In addition, DvdStd NSE-O-2.1 of the Orcutt Community Plan states that standard construction working hours of 7:00 a.m. to 4:00 p.m. are required for all development activities, although flexibility to allow extended hours on weekdays or occasional working hours on Saturdays can be permitted on a case-by-case basis (County of Santa Barbara 2013). With implementation of Mitigation Measure N-01 (see below), which limits construction noise to 65 CNEL at the property line of sensitive receivers and establishes requirements for construction working hours, the potential impact would be reduced to a less-than-significant level. Therefore, impacts related to the short-term exposure of people to noise levels exceeding County thresholds would be less than significant with mitigation.

Cumulative Impacts:

The proposed project would not introduce permanent sources of noise and would not increase vehicular traffic on U.S. Highway 101. Therefore, the proposed project would not increase long-term ambient noise levels within the study area and immediate vicinity. As such, the impacts of the proposed project combined with the impacts of cumulative projects listed in Table 2 in Section 3.3, *Cumulative Impacts Methodology*, would be less than cumulatively considerable.

Project construction activities would generate short-term noise that could impact noise-sensitive land uses within and near the project site. It is unknown at this time when the proposed project would be constructed; therefore, it is possible that the proposed project would be constructed at the same time as other cumulative projects located within 1,600 feet of noise-sensitive receivers impacted by construction activities associated with the proposed project. However, Mitigation Measure N-01 would reduce the

[7] The future SMJUHSD Agricultural Education and Career Technical Center would be located approximately 1,800 feet north of project construction activities. Therefore, given that the County's threshold for potential construction noise impacts is 1,600 feet, this analysis does not evaluate impacts to this school.

short-term noise impacts of the proposed project to a less-than-significant level. Therefore, the proposed project's contribution to a significant cumulative noise impact would be less than cumulatively considerable.

Mitigation and Residual Impact:

The proposed project could result in a potentially significant impact if construction noise worsens the existing exceedance of the County's noise threshold of 65 CNEL at residential properties west of U.S. Highway 101. With implementation of Mitigation Measure N-01, the potential impact would be reduced to a less-than-significant level:

MM N-01 **Construction Noise Control and Equipment Shielding.** The project proponent, including all contractors and subcontractors, shall limit construction activity, including equipment maintenance and site preparation, to the hours of 7:00 a.m. and 4:00 p.m., Monday through Friday. No construction shall occur on weekends or State holidays. The County may grant extended working hours on weekdays and occasional working hours on Saturdays on an as-needed basis.

Construction noise shall be limited to 65 CNEL as measured at the property line of any parcel with an existing noise-sensitive land use (e.g., residential dwellings, transient lodging, hospitals, educational facilities, libraries, churches, and places of public assembly). The contractor may utilize a combination of techniques to reduce the impact of construction to less than 65 CNEL, such as the following noise attenuation techniques:

- Use new or well-maintained construction equipment that reduces sound levels.
- Maintain acoustic shielding of stationary construction equipment that generates noise in excess of 65 dBA L_{eq}.
- Limit construction activities to the hours of 7~~8~~:00 a.m. to 4:00 p.m.
- Implement a phased construction schedule to minimize or avoid multiple noise-generating activities occurring at the same time.
- Locate stationary construction equipment away from noise-sensitive land uses.
- Turn off idling equipment.
- Use other noise-dampening and sound diversion techniques.

PLAN REQUIREMENTS: These requirements shall be noted in plan specifications.

TIMING: The project proponent and contractor shall demonstrate compliance with noise standards to the County prior to commencement of construction and throughout construction activities.

MONITORING: The County shall ensure compliance prior to and throughout construction and shall respond to complaints.

4.12 PUBLIC FACILITIES

Will the proposal result in:	Poten. Signif.	Less than Signif. with Mitigation	Less Than Signif.	No Impact	Reviewed Under Previous Document
a. A need for new or altered police protection and/or health care services?				✓	
b. Student generation exceeding school capacity?				✓	
c. Significant amounts of solid waste or breach any national, state, or local standards or thresholds relating to solid waste disposal and generation (including recycling facilities and existing landfill capacity)?		✓			
d. A need for new or altered sewer system facilities (sewer lines, lift-stations, etc.)?				✓	
e. The construction of new storm water drainage or water quality control facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?				✓	

Existing Setting:

Public services include law enforcement, fire protection, schools, library, solid waste management, water, wastewater, and specialized facilities such as landfills and jails. Section 4.7, Fire Protection, addresses fire hazards and protection. Sections 4.13, Recreation, and 4.14, Transportation/Circulation, respectively, address potential impacts to recreation uses and roads and other transportation infrastructure.

The study area is located within the service area of the Santa Barbara County Fire Department Fire Station #22 located at 1600 Tiffany Park Court, Santa Maria and the Santa Barbara County Sheriff's Office Santa Maria Station located at 812-A West Foster Road, Santa Maria. The study area is also within the boundaries of the Orcutt Union School District, which provides instruction for kindergarten through eighth grade, and the SMJUHSD, which provides high school instruction. Solid waste generated in the vicinity of the project is transported to and disposed of at the City of Santa Maria Regional Landfill.

County Environmental Thresholds:

The County Environmental Thresholds (2018a) includes guidelines for the assessment of impacts to public facilities. The following threshold is applicable to this project:

Solid Waste

Any construction, demolition, or remodeling project of a commercial, industrial or residential development that is projected to create more than 350 tons of construction and demolition debris would have a significant impact on public services.

Impact Discussion

a, b. **No impact.** The proposed project would result in a future local road connection between the Union Valley Parkway/U.S. Highway 101 interchange and the adjoining frontage road (Rodeo Drive) on the east side of U.S. Highway 101. The proposed project would not include any residential or commercial development or any facilities that would require police protection, health care services, or school facilities. The proposed project would not affect existing service levels because it would not result in new residents or employees in the area, and the proposed project would not necessitate new or expanded public facilities. Furthermore, the proposed project would improve emergency access to the east side of U.S. Highway 101 at this location. Therefore, no impact on these public facilities would occur.

c. **Less than significant with mitigation.** In an effort to address landfill capacity and solid waste concerns, the California Legislature passed the Integrated Waste Management Act in 1989 (Assembly Bill 939), which mandated a reduction in waste disposed in landfills by 50 percent by the year 2000. Solid waste generation during construction of the future local roadway under proposed project would be short-term and minimal. The proposed project would require demolition of approximately 40,000 square feet of existing pavement (2,500 feet in length x 16 feet in width). Assuming a depth of one foot, the project would generate approximately 40,000 cubic feet, or 1,481 CY of demolished asphalt. One cubic yard of demolished asphalt weighs approximately 2,400 pounds, or 1.2 tons (California Department of Resources Recycling and Recovery 2018). Therefore, the project would generate approximately 1,777 tons of solid waste during demolition activities, which would exceed the County's threshold of 350 tons for construction-related solid waste impacts. Therefore, impacts would be potentially significant. With implementation of Mitigation Measure SolidW-01 (see below), which requires implementation of a Source Reduction and Solid Waste Management Plan that includes recycling at least 85 percent of asphalt pavement debris, the potential impact would be reduced to a less-than-significant level. Therefore, impacts would be less than significant with mitigation.

Operation of the future local roadway under proposed project would not generate any solid waste or affect landfill capacities. Therefore, operational impacts would be less than significant.

d. **No impact.** The proposed project would involve a future local road connection. The proposed project would not include any residential or commercial development and would not generate demand for new or altered sewage system facilities. No impact would occur.

e. **No impact.** The proposed project would involve the construction of stormwater drainage improvements along and adjacent to the future local road connection, including improvements to flow conveyance systems to avoid ponding, prevent spread into travel lanes, and eliminate erosion. Bioswales and water quality basins would be installed where necessary. Because these components are part of the proposed project, the environmental impacts of these stormwater drainage and water quality control facilities are discussed throughout this IS-MND. The proposed project would not require additional new stormwater drainage or water quality control facilities or expansion of existing facilities beyond those considered in this IS-MND. Therefore, no impact would occur.

Cumulative Impacts:

Implementation of the proposed project would not result in any substantial change to the study area that would affect public facilities with implementation of Mitigation Measure SolidW-01. In addition, any future roadway connections or improvements under the proposed project would ultimately result in improved emergency access to the east side of U.S. Highway 101 within the vicinity of the study area. Thus, the project would not contribute to any cumulatively considerable effects to public facilities with mitigation.

Mitigation and Residual Impact:

The proposed project could result in a potentially significant impact related to construction and demolition debris. With implementation of Mitigation Measure SolidW-01, the potential impact would be reduced to a less-than-significant level:

MM SolidW-01 **Solid Waste SRSWMP:** The project proponent shall develop and implement a Source Reduction and Solid Waste Management Plan (SRSWMP) describing proposals to reduce the amount of waste generated during construction and enumerating the estimated reduction in solid waste disposed at each phase of project development.

PLAN REQUIREMENTS: The plan shall include but not be limited to:

a. A description of how fill will be used on the construction site, instead of landfilling.
b. A program to purchase materials that have recycled content for project construction.
c. A plan to reduce construction and demolition debris to less than 350 tons, including a requirement to recycle a minimum of 85 percent of asphalt pavement debris.
d. Recycling and composting programs including separating excess construction materials on site for reuse/recycling or proper disposal (e.g., concrete, asphalt, wood, brush). Separate on-site bins shall be provided as needed for recycling.

TIMING: The project proponent shall submit the SRSWMP to the County for review and approval prior to permit issuance, if required, or prior to commencement of grading and construction.

MONITORING: County staff shall review the SRSWMP prior to the issuance of permits for grading and construction. County staff shall conduct site inspections to ensure compliance with the SRSWMP during grading and construction.

4.13 RECREATION

Will the proposal result in:	Poten. Signif.	Less than Signif. with Mitigation	Less Than Signif.	No Impact	Reviewed Under Previous Document
a. Conflict with established recreational uses of the area?				✓	
b. Conflict with biking, equestrian and hiking trails?				✓	
c. Substantial impact on the quality or quantity of existing recreational opportunities (e.g., overuse of an area with constraints on numbers of people, vehicles, animals, etc. which might safely use the area)?				✓	

Existing Setting:

The study area is not located on or adjacent to any County-designated recreational facilities. However, the study area contains part of the Elks Unocal Event Center, a private recreational facility that includes a grandstand and rodeo grounds, the Santa Maria BMX track, and The Shack Paintball Field.

Impact Discussion:

a. **No impact.** The proposed project would involve a future local road connection. It would not alter the Elks Unocal Event Center or conflict with established recreational uses. No impact would occur.

b. **No impact.** The existing Union Valley Parkway overpass and extension east of U.S. Highway 101 include a Class II-designated bicycle lane in each direction. No bicycle lanes are designated along Rodeo Drive. The proposed project would not alter the existing bicycle lanes along Union Valley Parkway. No impact would occur.

c. **No impact.** The proposed project would involve a future local road connection. The proposed project would not include residential land uses and would not generate new population. Therefore, the proposed project would not result in increased demand for new recreational facilities and would not substantially impact the quality or quantity of existing recreational opportunities. No impact would occur.

Cumulative Impacts:

Implementation of the proposed project would not result in any substantial change to the study area that would affect recreation. Thus, the proposed project would not contribute to any cumulatively considerable effects to recreation.

Mitigation and Residual Impact:

No significant impacts were identified; therefore, mitigation is not required.

4.14 TRANSPORTATION/CIRCULATION

Will the proposal result in:	Poten. Signif.	Less than Signif. with Mitigation	Less Than Signif.	No Impact	Reviewed Under Previous Document
a. A need for private or public road maintenance, or need for new road(s)?				✓	
b. Effects on existing parking facilities, or demand for new parking?				✓	
c. Substantial impact upon existing transit systems (e.g. bus service) or alteration of present patterns of circulation or movement of people and/or goods?			✓		
d. Alteration to waterborne, rail or air traffic?				✓	
e. Increase in traffic hazards to motor vehicles, bicyclists or pedestrians (including short-term construction and long-term operational)?		✓			
f. Inadequate sight distance?				✓	
Ingress/egress?				✓	
Emergency access?				✓	
g. Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)? (Impact on vehicles miles traveled (VMT).)				✓	

The following impact discussion is based, in part, on the Traffic Impact Study prepared by PSOMAS in May 2020. The Traffic Impact Study is included in full as Attachment 7.

Existing Setting:

The existing Union Valley Parkway overpass and extension east of U.S. Highway 101 include a Class II-designated bicycle lane in each direction, which begin/terminate prior to the existing cul-de-sac east of the U.S. Highway 101 on-/off-ramp. Union Valley Parkway also has a sidewalk along the eastbound lane that terminates at the U.S. Highway 101 on-/off-ramp. No bicycle lanes or sidewalks are present along Rodeo Drive or Santa Maria Way. Under existing conditions, all parking for the Elks Unocal Event Center is located on-site, and Rodeo Drive does not include on-street parking. There are no existing transit routes within the study area.

Regulatory Setting:

On September 27, 2013, Governor Brown signed Senate Bill (SB) 743[8] (Steinberg, 2013) into law and started a process that fundamentally changed the criteria for determining the significance of a project's transportation impacts under CEQA. Specifically, SB 743 required new criteria that "… promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses." [PRC Section 21099(b)(1)]

To that end, on December 28, 2018, the California Natural Resources Agency certified and adopted revisions to the CEQA Guidelines[9] that state, "vehicle miles traveled is the most appropriate measure of transportation impacts." [CEQA Guidelines Section 15064.3] With this change, the County and other lead agencies can no longer use automobile delay, as measured by "level of service" (LOS) or similar

[8] Codified in the California Public Resources Code (PRC), Division 12, Chapter 2.7, Section 21099.
[9] Codified in the California Code of Regulations (CCR), Title 14, Division 6, Chapter 3, Section 15000 et seq.

measures of vehicular capacity or traffic congestion, to assess transportation impacts under CEQA. [PRC Section 21099(b)(2) and CCR Section 15065.3(a)]

The CEQA Guidelines require that lead agencies begin using VMT to assess transportation impacts under CEQA by July 1, 2020. [CEQA Guidelines Section 15064.3(c)]

County Environmental Thresholds:

Section 4.14 (Transportation/Circulation) of the County's initial study/negative declaration prototype and Chapter 19 (Thresholds of Significance for Transportation Impacts) of the County Environmental Thresholds contain some thresholds of significance that use LOS-based metrics to assess transportation impacts. These thresholds are now null and void. Therefore, the County is developing new thresholds of significance that shift from LOS to VMT-based metrics and otherwise comply with SB 743. The County expects to adopt new thresholds in fall 2020.

The initial study/negative declaration prototype includes seven criteria for determining whether a project may have a significant transportation impact. Three of these criteria incorporate automobile delay, traffic congestion, and/or vehicular capacity:

a) Generation of substantial additional vehicular movement (daily, peak-hour, etc.) in relation to existing traffic load and capacity of the street system?

f) …general road capacity?

h) Impacts to Congestion Management Plan system?

To comply with PRC Section 21099(b)(2) and CEQA Guidelines Section 15064.3(a), the County omitted the "general road capacity" criterion from (f) and replaced criteria (a) and (h) with the following VMT-based threshold from Appendix G of the CEQA Guidelines for purposes of this environmental review:

h) Would the project conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b)?

Lead agencies can no longer use LOS or similar measures of vehicular capacity or traffic congestion to assess transportation impacts under CEQA. Nonetheless, these measures remain important metrics for transportation planning, and projects must still comply with LOS-based policies and standards in the Comprehensive Plan and other applicable plans, regulations, and documents. County planners and decision-makers must consider such metrics outside of the CEQA process. Therefore, the Traffic Impact Study (PSOMAS 2020; Attachment 7) analyzes the project's consistency with the applicable LOS-based policies and standards in the Orcutt Community Plan, County Engineering Design Standards, and Caltrans Highway Manual.

Impact Discussion:

a. **No impact.** The proposed project would involve construction of a local road connection. The environmental impacts of this road connection are discussed throughout this IS-MND. The proposed project would not result in a need for additional new roads or road maintenance beyond that considered in this IS-MND. Therefore, no impact would occur.

b. **No impact.** The proposed project would involve construction of a local road connection. The purpose of the project is to decrease existing traffic congestion<u>, provide secondary access to land uses east of U.S. Highway 101, including the Elks Unocal Event Center and the new SMJUHSD Agricultural Education and Career Technical Center (under construction),</u> and improve safety and emergency vehicle access. As such, the project would not directly induce additional vehicular trip generation in the study area. Under existing conditions, all parking for the Elks Unocal Event Center is located on-site, and Rodeo Drive does not include on-street parking. Therefore, the project would have no impact to existing parking facilities and would not result in demand for new parking.

c. **Less than significant.** There are no existing transit routes within the study area; therefore, the project would result in no impact to existing transit system. The project would alter present patterns of circulation in the study area by constructing a future local road connection. However, the project would mainly redistribute existing traffic, improve safety and emergency response times, and provide secondary access to the study area. Therefore, the proposed project would have less than significant impacts on present patterns of circulation and movement.

d. **No impact.** The study area is approximately 28 miles from the closest port (Port San Luis), 6 miles from the closest railway tracks (Amtrak), and 10 miles from the closest railway station (Amtrak Guadalupe Station). Therefore, the project would not impede or affect waterborne or rail traffic. The study area is also approximately 1.4 miles from the closest airport (Santa Maria Airport). According to the adopted Santa Barbara County Airport Land Use Plan (SBCAG 1993), the study area is located outside of the limits of the Santa Maria Airport's Flight Approach and Flight Clear Zones, and, therefore, is not subject to airport compatibility concerns. The project would not involve any development that would impede or affect aircraft overflights. As a result, the project would not alter waterborne, rail, or air traffic, and no impact would occur.

e. **Less than significant with mitigation.** No sidewalks or bicycle lanes currently exist in the study area, except for relatively short segments along the Union Valley Parkway overpass. The proposed project would involve construction of a local road connection. The purpose of the project is to decrease existing traffic congestion and improve safety and emergency vehicle access. Short-term construction staging and construction vehicle movements in the County and Caltrans rights-of-way could result in increased traffic hazards, such as conflicts with pedestrians, bicyclists, and passenger vehicles on Union Valley Parkway and Rodeo Drive. Therefore, the project could result in a temporary increase in traffic hazards during the construction period and this impact would be potentially significant. With implementation of Mitigation Measure Traf-01 (see below), which requires the placement of construction staging areas in locations that minimize traffic hazards to motor vehicles, bicyclists, and pedestrians, and the provision of traffic control during all construction hours, the potential impact would be reduced to a less-than-significant level. Therefore, potential impacts during short-term construction would be reduced to a less-than-significant level. Therefore, potential short-term impacts associated with a temporary increase in traffic hazards during project construction would be less than significant with mitigation.

f. **No impact.** The proposed project would be required to be designed in accordance with the requirements of the County's *Engineering Design Standards* (2011) or Caltrans standards, as applicable, which include safety requirements such as those for sight distance. The proposed project would not alter ingress/egress from any of the existing intersections and driveways along Rodeo Drive. As such, no impacts related to inadequate sight distance or ingress/egress would occur. The proposed project would improve emergency access to the east side of U.S. Highway 101 in the study area, especially during large events at the Elks Unocal Event Center; therefore, no impacts related to emergency access would occur.

g. **No impact.** Transportation projects have the potential to change travel patterns. A key consideration under CEQA Guidelines Section 15064.3(b)(2) is whether a project will add additional vehicle travel onto a roadway network or induce VMT. The proposed project is a local access improvement, providing secondary/local access to existing development to the east of U.S. Highway 101. The project would not add travel lanes or increase the capacity of the existing roadways. Additionally, the project would not change existing land uses or generate new trips to the study area. Traffic volumes would remain the same regardless of whether the proposed project is constructed.

The project would mainly redistribute existing traffic, improve safety and emergency response times, and provide secondary access to the study area. As a result, the proposed project would not result in increases in VMT for the region. By providing a local connection to Union Valley Parkway, the proposed project would reduce VMT for drivers in the study area traveling from or to areas near or south of Union Valley Parkway or accessing the Elks Unocal Event Center and other parcels east of U.S. Highway 101. With construction of the proposed project, drivers could access Union Valley Parkway or southbound U.S. Highway 101 without the need to travel out of their way to the Santa Maria Way interchange.

According to the CEQA Guidelines Section 15064.3(b)(2), "Transportation projects that reduce, or have no impact on, vehicle miles traveled should be presumed to cause a less than significant transportation impact." Therefore, no impact on induced travel or VMT would occur.

Cumulative Impacts:

The proposed project would have no impacts related to additional new roads or road maintenance (beyond that considered in this IS-MND); parking supply or demand; existing transit system; waterborne, rail, or air traffic; inadequate sight distance, ingress/egress, or emergency access; or induced travel or VMT. Accordingly, the proposed project combined with cumulative development would not contribute to cumulative impacts on such transportation/circulation issues.

During construction, the proposed project would result in increased traffic hazards, such as conflicts with pedestrians, bicyclists, and passenger vehicles on Union Valley Parkway and Rodeo Drive. With implementation of mitigation (a Transportation Management Plan during project construction), potential impacts would be reduced to a less-than-significant level. The proposed project would not result in long-term traffic hazards, as the purpose of the project is to decrease existing traffic congestion and improve safety and emergency vehicle access in the study area. Thus, the proposed project would not contribute to cumulative impacts to traffic hazards.

Mitigation and Residual Impact:

The proposed project could result in a potentially significant impact related to traffic hazards during construction activities. With implementation of Mitigation Measure Traf-01, the potential impact would be reduced to a less-than-significant level:

MM Traf-01 **Construction Transportation Management Plan:** The construction contractor shall prepare and submit a Transportation Management Plan (TMP) to the County of Santa Barbara and Caltrans, as necessary, for review and approval prior to construction or issuance of applicable permits. The TMP shall be implemented throughout the duration of project construction.

PLAN REQUIREMENTS: The construction contractor shall include in the project-specific TMP:

1. Identify construction-related vehicle routes and timing restrictions. Truck routes shall minimize travel on roadways where truck traffic is ordinarily not permitted or weight restrictions are imposed. Haul trucks shall not travel to and from the study area during morning peak hours (between 7:00 a.m. to 9:00 a.m.) or evening peak hours (between 4:00 p.m. and 6:00 p.m.).
2. Identify construction staging area(s), including but not limited to the storage of equipment and materials, that are located in areas that minimize traffic hazards to motor vehicles, bicyclists, and pedestrians. Construction equipment and materials shall only occur within the identified staging areas.
3. The TMP shall include the following requirements to minimize damage to the existing roadway network:

    - A list of precautionary measures to protect the existing roadway network, including but not limited to pavements, curbs, gutters, sidewalks, and drainage structures, shall be outlined. The construction contractor(s) shall be required to implement these measures throughout the duration of project construction.
    - Union Valley Parkway shall be surveyed prior to the start of project construction activities, and existing roadway conditions shall be summarized in a brief report.
    - Any damage to the roadway network that occurs as a result of project construction activities shall be noted, and the project sponsors shall repair all damage.

4. Identify emergency access routes and detours (if any) for emergency response along roadways potentially affected by project construction. Additionally, describe procedures in place to provide priority access for emergency service vehicles through the construction work zone. The TMP shall include requirements to notify local emergency response providers, including Santa Barbara County Fire Department, the Santa Barbara County Sheriff's Office, ambulance services, and paramedic services at least one week prior to the start of work within public ROWs if lane and/or road closures are required. To the extent possible, the duration of disruptions/closures to roadways and critical access points for emergency services shall be minimized.
5. Describe traffic control measures to be implemented to manage traffic and reduce potential traffic impacts in accordance with the most recent version of the California Manual of Uniform Traffic Control Devices. Traffic control measures shall include one or more of the following: flag persons; warning signs; lights; and/or barricades and/or cones to provide safe passage of vehicular (including cars and buses), bicycle, and pedestrian traffic, and access by emergency responders.
6. Identify off-street or turnout parking areas in which construction workers shall park and delineate those in the contractor specifications. Construction workers shall only park in designated areas.
7. Identify the location of any transit stops and transit and bicycle routes that may be temporarily impacted by construction activities and identify places to temporarily relocate transit stops and transit and bicycle routes, if necessary. Describe signage to be used for relocated transit, bicycle, or pedestrian facilities during project construction. Transit stops and transit and bicycle routes shall be temporarily relocated, as needed, with appropriate detour signage posted during project construction.

TIMING: The Construction TMP shall be prepared by the construction contractor, and the County shall review and approve the Construction TMP prior to issuance of grading and construction permits.

MONITORING: The County shall conduct inspections of the project construction, and respond to complaints, as needed, during construction.

4.15 WATER RESOURCES/FLOODING

Will the proposal result in:	**Poten. Signif.**	**Less than Signif. with Mitigation**	**Less Than Signif.**	**No Impact**	**Reviewed Under Previous Document**
a. Changes in currents, or the course or direction of water movements, in either marine or fresh waters?				✓	
b. Changes in percolation rates, drainage patterns or the rate and amount of surface water runoff?			✓		
c. Change in the amount of surface water in any water body?				✓	
d. Discharge, directly or through a storm drain system, into surface waters (including but not limited to wetlands, riparian areas, ponds, springs, creeks, streams, rivers, lakes, estuaries, tidal areas, bays, ocean, etc.) or alteration of surface water quality, including but not limited to temperature, dissolved oxygen, turbidity, or thermal water pollution?		✓			
e. Alterations to the course or flow of flood water or need for private or public flood control projects?				✓	
f. Exposure of people or property to water related hazards such as flooding (placement of project in 100-year flood plain), accelerated runoff or tsunamis, sea level rise, or seawater intrusion?				✓	
g. Alteration of the direction or rate of flow of groundwater?				✓	
h. Change in the quantity of groundwater, either through direct additions or withdrawals, or through interception of an aquifer by cuts or excavations or recharge interference?				✓	
i. Overdraft or over-commitment of any groundwater basin? Or, a significant increase in the existing overdraft or over-commitment of any groundwater basin?				✓	
j. The substantial degradation of groundwater quality including saltwater intrusion?		✓			
k. Substantial reduction in the amount of water otherwise available for public water supplies?				✓	
l. Introduction of storm water pollutants (e.g., oil, grease, pesticides, nutrients, sediments, pathogens, etc.) into groundwater or surface water?		✓			

Existing Setting:

The proposed project would be located partially on undeveloped land and partially on roadways and within the County and Caltrans rights-of-way. Two major stormwater detention basins are located within the study area, north and south of the existing segment of Union Valley Parkway that extends east of U.S. Highway 101. <u>Caltrans owns and maintains both detention basins, which were constructed in 2010 as part of the U.S. Highway 101/Union Valley Parkway interchange.</u>

No mapped, permanent surface water bodies exist in the study area (United States Geological Survey 2019b). The study area is underlain by the Santa Maria River Valley groundwater basin, which has been given a draft basin prioritization of “very low” by the California Department of Water Resources (California Department of Water Resources 2019).

The study area is not located within the 100-year floodplain or within a tsunami inundation zone (Federal Emergency Management Agency 2005, California Geological Survey 2019).

County Environmental Thresholds:

Water Resources

A project may have a significant effect on water resources if it would exceed established threshold values that have been set for each over-drafted groundwater basin. These values were determined based on an estimation of a basin’s remaining life of available water storage. If the project’s net new consumptive water use [total consumptive demand adjusted for recharge less discontinued historic use] exceeds the threshold adopted for the basin, the project’s impacts on water resources are considered significant. A project is also deemed to have a significant effect on water resources if a net increase in pumpage from a well would substantially affect production or quality from a nearby well.

Water Quality

The County Environmental Thresholds (2018a) state a significant impact on water quality may occur if the project involves any of the following:

- Is located within an urbanized area of the county and the project construction or redevelopment individually or as a part of a larger common plan of development or sale would disturb one (1) or more acres of land;
- Increases the amount of impervious surfaces on a site by 25% or more;
- Results in channelization or relocation of a natural drainage channel;
- Results in removal or reduction of riparian vegetation or other vegetation (excluding non-native vegetation removed for restoration projects) from the buffer zone of any streams, creeks or wetlands;
- Is an industrial facility that falls under one or more of categories of industrial activity regulated under the National Pollutant Discharge Elimination System (NPDES) Phase I industrial storm water regulations (facilities with effluent limitation; manufacturing; mineral, metal, oil and gas, hazardous waste, treatment or disposal facilities; landfills; recycling facilities; steam electric plants; transportation facilities; treatment works; and light industrial activity);
- Discharges pollutants that exceed the water quality standards set forth in the applicable NPDES permit, the Regional Water Quality Control Board’s (RWQCB) Basin Plan or otherwise impairs the beneficial uses[1] of a receiving water body;
- Results in a discharge of pollutants into an “impaired” water body that has been designated as such by the State Water Resources Control Board or the RWQCB under Section 303(d) of the Federal Water Pollution Prevention and Control Act (i.e., the Clean Water Act); or
- Results in a discharge of pollutants of concern to a receiving water body, as identified by the RWQCB.

Impact Discussion:

a. **No impact.** The proposed project would not require construction in any rivers, creeks, or estuaries. Therefore, the project would not result in changes in currents or in the course or direction of water movements in either marine or fresh waters, and no impact would occur.

b. **Less than significant.** The proposed project would increase the amount of impervious surfaces within the study area, which would potentially increase the amount of surface runoff. However, the project would include drainage improvements to flow conveyance systems to avoid ponding, prevent spread of water into travel lanes, and minimize erosion. Bioswales and water quality basins would be constructed where necessary. Existing stormwater runoff patterns would be perpetuated. Therefore, the proposed project would not result in substantial changes in percolation rates, drainage patterns, or the rate and amount of surface runoff, and impacts would be less than significant.

c. **No impact.** No permanent surface water bodies exist within the study area. Existing stormwater runoff patterns would be preserved, and stormwater runoff from the proposed project would be directed into existing detention basins and storm drains. Therefore, the project would not change the amount of surface water in any water body, and no impact would occur.

d, j, l. **Less than significant with mitigation.** Construction of the project has the potential to result in stormwater runoff with degraded water quality primarily due to erosion and accidental releases of oil, fuels, lubricants, or coolants. However, the project would be constructed in accordance with mandatory federal, State, and local laws, policies, and regulations, which would require implementation of a project-specific SWPPP that would address erosion, sediment discharge, and water quality and pollution control during all phases of construction through implementation of BMPs. Therefore, short-term construction impacts to surface water and groundwater quality would be less than significant.

During operation, stormwater runoff from the proposed project would potentially contain pollutants associated with roadways, such as fuels and oils. Stormwater runoff would be similar in quality to stormwater runoff from other roadways in the immediate vicinity including U.S. Highway 101, Union Valley Parkway, and Rodeo Drive. The proposed project would include drainage improvements to flow conveyance systems, and bioswales and water quality basins would be constructed where necessary. Existing stormwater runoff patterns would be perpetuated. Nevertheless, the study area is not located in the County's NPDES Municipal General Permit area and is therefore not subject to the Central Coast RWCQB's post-construction stormwater management requirements (County of Santa Barbara 2019c). Therefore, impacts to surface water and groundwater quality due to stormwater runoff would be potentially significant. With implementation of Mitigation Measure Wat-01 (see below), which requires implementation of a post-construction stormwater control plan, the potential impacts would be reduced to a less-than-significant level. Therefore, impacts would be less than significant with mitigation.

e. **No impact.** The project would not be located in the 100-year floodplain and would therefore not result in alterations to the course or flow of flood water (Federal Emergency Management Agency 2005). In addition, the project would not increase the potential for flooding in the area because the project would include stormwater drainage and water quality improvements in conformance with County and Caltrans standards. Drainage improvements would include improvements to flow conveyance systems to avoid ponding, prevent spread into travel lanes, and eliminate erosion. As such, the project would not result in the need for private or public flood control projects. No impact would occur.

f. **No impact**. The study area is not located in the 100-year floodplain or in a tsunami inundation zone (Federal Emergency Management Agency 2005, California Geological Survey 2019). Furthermore, the study area is located approximately 12 miles inland from the Pacific Ocean. Therefore, the project would not expose people or property to water-related hazards such as flooding, accelerated runoff, tsunamis, sea level rise, or seawater intrusion.

g.-i. **No impact**. The proposed project would not require dewatering during construction or permanent groundwater withdrawal during operation. The project would not include subsurface components that could alter the direction of groundwater flow. In addition, although the project would incrementally increase the amount of impervious surfaces within the study area, stormwater runoff would be directed toward existing detention basins where it could percolate into the underlying groundwater basin. Furthermore, the extent of the proposed project would be relatively small given the large expanses of land immediately east of the study area that are available for groundwater recharge. Therefore, the project would not result in the alteration of the direction or rate of flow of groundwater, change the quantity of groundwater, or result in the overdraft or over-commitment of any groundwater basin. No impact would occur.

k. **No impact.** The proposed project would not require dewatering during construction or permanent groundwater withdrawal during operation. In addition, although the project would incrementally increase the amount of impervious surfaces within the study area, stormwater runoff would be directed toward detention basins where it could percolate into the underlying groundwater basin. Therefore, the project would not result in a substantial reduction in the amount of water otherwise available for public water supplies. No impact would occur.

Cumulative Impacts:

The County Environmental Thresholds were developed, in part, to define the point at which a project's contribution to a regionally significant impact constitutes a significant effect at the project level. In this instance, the project has been found not to exceed the threshold of significance for water resources with implementation of Mitigation Measure Wat-01. Therefore, the project's contribution to the regionally significant issues of water supplies and water quality is not considerable and is less than significant with mitigation.

Mitigation and Residual Impact:

The proposed project could result in a potentially significant impact to water quality. With implementation of Mitigation Measure Wat-01, the potential impact would be reduced to a less-than-significant level:

MM Wat-01 **Post-Construction Stormwater Control Plan:** Prior to project construction, the County shall prepare a final Post-Construction Stormwater Control Plan designed to prevent the entry of pollutants from the study area into the storm drain system after construction. The Post-Construction Stormwater Control Plan shall follow the County Stormwater Technical Guide for Low Impact Development. The Post-Construction Stormwater Control Plan shall include maps, figures, supporting design calculations, and a narrative explaining the methods and approach proposed to protect or enhance water quality. The plan shall include supporting information including but not limited to the infiltration and retention properties of the native or engineered substrate, depth to groundwater, and the hydraulic design and pollutant treatment/removal capability of the proposed improvements adequate to ensure that water quality will be protected.

PLAN REQUIREMENTS: Project-specific BMPs and requirements from the SWPPP shall be included in plan specifications.

TIMING: The Contractor shall submit the SWPPP for County review. The SWPPP requirements shall be implemented prior to the commencement of construction and maintained throughout the construction phase.

MONITORING: The County shall review the SWPPP prior to issuance of grading and construction permits, if required, and shall perform site inspections throughout the construction phase to ensure the measures are fully implemented.

5.0 INFORMATION SOURCES

Calflora. 2020. "*Agrostic hooveri* – Plant Distribution." https://www.calflora.org/cgi-bin/species_query.cgi?where-calrecnum=148 (accessed January 2020).

California Air Resources Board (CARB). 2005. *Air Quality and Land Use Handbook: A Community Health Perspective*. April 2005. https://ww3.arb.ca.gov/ch/handbook.pdf (accessed October 2019).

____. 2017. *California's 2017 Climate Change Scoping Plan*. November 2017. https://ww3.arb.ca.gov/cc/scopingplan/scoping_plan_2017.pdf (accessed December 2019).

California Department of Conservation (CDC). 2016. "California Important Farmland Finder." https://maps.conservation.ca.gov/DLRP/CIFF/ (accessed October 2019).

____. 2019a. "Earthquake Zones of Required Investigation." https://maps.conservation.ca.gov/cgs/EQZApp/app/ (accessed September 23, 2019).

____. 2019b. "Well Finder." https://maps.conservation.ca.gov/doggr/wellfinder (accessed September 2019).

California Department of Forestry and Fire Protection (CAL FIRE). 2008. *Very High Fire Hazard Severity Zones in LRA as Recommended by CAL FIRE – Santa Barbara County* [map]. 1:125,000. September 2, 2008. https://osfm.fire.ca.gov/media/6762/fhszl_map42.pdf (accessed September 2019).

California Department of Toxic Substances Control. 2019. "EnviroStor." https://www.envirostor.dtsc.ca.gov (accessed September 2019).

California Department of Transportation (Caltrans). 2013. Technical Noise Supplement to the Traffic Noise Analysis Protocol. (CT-HWANP-RT-13-069.25.2) September. http://www.dot.ca.gov/hq/env/noise/pub/TeNS_Sept_2013B.pdf (accessed December 2019).

____. 2017. "List of eligible and officially designated State Scenic Highways." Last modified: March 2017. https://dot.ca.gov/programs/design/lap-landscape-architecture-and-community-livability/lap-liv-i-scenic-highways (accessed September 2019).

California Department of Resources Recycling and Recovery. 2018. "Calculations - Solid Waste Cleanup Program Weights and Volumes for Project Estimates." Last modified: August 20, 2018. https://www.calrecycle.ca.gov/swfacilities/cdi/tools/calculations (accessed January 2020).

California Department of Water Resources. 2019. "SGMA Basin Prioritization Dashboard." https://gis.water.ca.gov/app/bp-dashboard/p2/ (accessed October 2019).

California Geological Survey. 2002. California Geomorphic Provinces, Note 36.

____. 2019. "Santa Barbara County Tsunami Inundation Maps." https://www.conservation.ca.gov/cgs/tsunami/maps/Santa-Barbara (accessed October 2019).

Crocker, Malcolm J. (Editor). 2007. Handbook of Noise and Vibration Control Book, ISBN: 978-0-471-39599-7, Wiley-VCH, October.

Dibblee, T.W., and Ehrenspeck, H.E., ed. 1989. Geologic map of the Casmalia and Orcutt quadrangles, Santa Barbara County, California: Dibblee Geological Foundation, Dibblee Foundation Map DF-24, scale 1:24,000.

Federal Emergency Management Agency. 2005. Flood Insurance Rate Map #06083C0195F. September 30, 2005. https://msc.fema.gov/ (accessed October 2019).

Global Rangelands. 2019. "SRM Glossary." https://globalrangelands.org/glossary/R?term= (accessed October 2019).

Intergovernmental Panel on Climate Change. Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II, and III to the Firth Assessment report of the Intergovernmental Panel on Climate Change [Core Writing Team, R.K. Pachauri and L.A. Mayer (eds.)]. IPCC, Geneva, Switzerland.

____. 2018. *Special Report: Global Warming of 1.5°C - Summary for Policymakers.* https://www.ipcc.ch/sr15/ (accessed October 2019).

Issacs, C.M. 1987. Petroleum Geology of the Santa Maria Basin Assessment Province, California for the 1987 National Assessment of Undiscovered Oil and Gas Resources. U.S. Geological Survey Open-File Report 89-450 C. https://pubs.usgs.gov/of/1989/0450c/report.pdf (accessed October 2019).

Johnston, Jason. 2019. Supervisor, County of Santa Barbara Environmental Health Services. Personal communication regarding permitted water wells within the study area with Annaliese Miller, Associate Environmental Planner, Rincon Consultants, Inc. November 25, 2019.

Kinsler, Lawrence E., Austin R. Frey, Alan B. Coppens, and James V. Sanders. 1999. Fundamentals of Acoustics, 4th Edition. ISBN 0-471-84789-5. Wiley-VCH, December 1999.

PSOMAS. 2020. Traffic Impact Study for Orcutt Community Plan Amendment. May 2020.

Rincon Consultants, Inc. (Rincon). 2020a. Biological Resources Reconnaissance Survey Results for the Orcutt Community Plan Amendment Project, Santa Barbara County, California. February 20, 2020.

____. 2020b. Cultural Resources Assessment for the Orcutt Community Plan Amendment Project, Community of Orcutt, Santa Barbara County, California. February 20, 2020.

Santa Barbara, County of. 1994. Orcutt Community Plan Update Final Environmental Impact Report (State Clearinghouse No. 95031055).

____. 2009. Santa Barbara County Comprehensive Plan Scenic Highways Element. May 2009. https://www.countyofsb.org/plndev/policy/comprehensiveplan/scenichighwayselement.sbc (accessed September 2019).

____. 2010. Santa Barbara County Comprehensive Plan Conservation Element. August 2010. https://www.countyofsb.org/plndev/policy/comprehensiveplan/conservationelement.sbc (accessed October 2019).

____. 2011. *Engineering Design Standards*. September 2011. https://www.countyofsb.org/pwd/asset.c/215 (accessed December 2019).

____. 2013. Orcutt Community Plan. Adopted in July 1997, last amended June 2013. http://www.countyofsb.org/plndev/policy/communityplans/orcutt.sbc (accessed October 2019).

____. 2014. “field_boundaries_42.shp” [GIS shapefiles]. https://countyofsb.org/agcomm/downloads.sbc (accessed October 2019).

____. 2015a. County of Santa Barbara Energy and Climate Action Plan. May 2015. https://www.countyofsb.org/plndev/projects/ecap.sbc (accessed October 2019).

____. 2015b. *Final Environmental Impact Report for the Energy and Climate Action Plan*. May 2015. https://www.countyofsb.org/plndev/projects/ecap.sbc (accessed October 2019).

____. 2015c. Santa Barbara County Comprehensive Plan Seismic Safety & Safety Element. Last amended: February 2015. https://www.countyofsb.org/plndev/policy/comprehensiveplan/safetyelement.sbc (accessed September 2019).

____. 2018a. Environmental Thresholds and Guidelines Manual. March 2018.

____. 2018b. *Santa Barbara County Uniform Rules for Agricultural Preserves and Farmland Security Zones*. August 2018. https://cosantabarbara.app.box.com/s/koitjfnanayxkh7cu9q30oozar2chnq5 (accessed December 2019).

____. 2018c. *2016 Greenhouse Gas Emissions Inventory Update and Forecast*. June 2018. countyofsb.org/plndev/projects/ecap.sbc (accessed October 2019).

____. 2019a. 2018 Agricultural Production Report. https://countyofsb.org/agcomm/cropReportArchive.sbc (accessed October 2019).

____. 2019b. 2019 Cumulative Permit/Pesticide Use Information for County of Santa Barbara (downloadable Microsoft Excel file). https://www.countyofsb.org/agcomm/downloads.sbc (accessed December 2019).

____. 2019c. “New and Redevelopment.” https://countyofsb.org/pwd/sbpcw/development/new-and-redevelopment.sbc (accessed October 2019).

Santa Barbara County Air Pollution Control District (SBCAPCD). 2017. 2016 Ozone Plan. October 2016. https://www.ourair.org/wp-content/uploads/Final-2016-Ozone-Plan-Approved-October-20-2016.pdf (accessed October 2019).

____. 2019. "Meeting Air Quality Standards." https://www.ourair.org/air-quality-standards/ (accessed October 2019).

Santa Barbara County Assessor's Office. 2020. County Photo~~m~~Mapper.

Santa Barbara County Association of Governments. 1993. Santa Barbara County Airport Land Use Plan. October 1993. http://www.sbcag.org/airport-land-use-commission.html#documents (accessed October 2019).

____. 2016. *Congestion Management Program*. October 20, 2016. http://www.sbcag.org/uploads/2/4/5/4/24540302/2016_congestion_management_program_doc_final.pdf (accessed December 2019).

____. 2017. *Fast Forward 2040: SBCAG Regional Transportation Plan and Sustainable Communities Strategy*. August 17, 2017. http://www.sbcag.org/rtp.html (accessed December 2019).

____. 2019. Draft Santa Maria Airport Land Use Compatibility Plan. August 2019. http://www.sbcag.org/airport-land-use-commission.html#documents (accessed October 2019).

Santa Maria Joint Union High School District (SMJUHSD). 2015. Final Mitigated Negative Declaration – Agricultural Education and Career Technical Center. June 2015.

Shapero, Matthew. 2019. Livestock & Range Advisor, University of California Cooperative Extension – Ventura and Santa Barbara Counties. Personal communication regarding the suitability of the study area for rangeland with Annaliese Miller, Associate Environmental Planner, Rincon Consultants, Inc. October 30, 2019.

Society of Vertebrate Paleontology (SVP). 2010. Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources. Society of Vertebrate Paleontology Impact Mitigation Guidelines Revision Committee.

State of California. 2018. California's Fourth Climate Change Assessment - Central Coast Region Report. September 2018. http://www.climateassessment.ca.gov/regions/ (accessed October 2019).

State Water Resources Control Board. 2019. "Geotracker." https://geotracker.waterboards.ca.gov (accessed September 2019).

____. 2019a. Irrigated Lands Regulatory Program. https://www.waterboards.ca.gov/water_issues/programs/agriculture/ (accessed September 2019).

Tennyson, M.E. 1992. Preliminary geologic map of Santa Maria 30' by 60' quadrangle, California. U.S. Geological Survey Open-File Report OF-92-189, scale 1:100,000.

Trupe, Debbie. 2019. Deputy Agricultural Commissioner, County of Santa Barbara. Personal communication via email regarding agricultural resources within the study area with Annaliese Miller, Associate Environmental Planner, Rincon Consultants, Inc. October 29, 2019.

United States Department of Agriculture (USDA). 1961. Land-Capability Classification – Agriculture Handbook No. 2010. https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf (accessed October 2019).

____. 2019. "Web Soil Survey." Last modified: April 9, 2019. https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm (accessed October 2019).

United States Environmental Protection Agency. 2019. "EnviroMapper." https://geopub.epa.gov/myem/efmap/ (accessed September 2019).

United States Fish and Wildlife Service (USFWS). 2010. Map of California Tiger Salamander Pond Habitats – Northern Area. Confidential map; not for distribution.

_____. 2016. Recovery Plan for the Santa Barbara County Distinct Population Segment of the California Tiger Salamander (*Ambystoma californiense*). Region 8, Ventura, California. December 12, 2016. https://www.fws.gov/ventura/docs/recplans/SB%20CTS%20Final%20RP%20Signed.pdf (accessed March 2020).

_____. 2017. Recovery Plan for the Central California Distinct Population Segment of the California Tiger Salamander (*Ambystoma californiense*). Pacific Southwest Region, Region 8. June 6, 2017. https://www.fws.gov/sacramento/es_species/Accounts/Amphibians-Reptiles/ca_tiger_salamander/ (accessed February 2020).

United States Geological Survey. 2019a. "U.S. Quaternary Faults." https://usgs.maps.arcgis.com/apps/webappviewer (accessed September 2019).

____. 2019b. "National Map Viewer." https://viewer.nationalmap.gov/advanced-viewer/ (accessed October 2019).

United States Global Change Research Program. 2018. *Fourth National Climate Assessment Volume II: Impacts, Risks, and Adaptation in the United States*. https://nca2018.globalchange.gov/ (accessed October 2019).

University of California Museum of Paleontology (UCMP) Online Database. 2019. UCMP Specimen Search Portal, http://ucmpdb.berkeley.edu/ (accessed October 2019).

Woodring, W.P., and Bramlette, M.N. 1950. Geology and Paleontology of the Santa Maria District California. U.S. Geological Survey Professional Paper 222. https://pubs.usgs.gov/pp/0222/report.pdf (accessed October 2019).

5.1 COUNTY DEPARTMENTS CONSULTED

Police, Fire, Public Works, Flood Control, Parks, Environmental Health, Special Districts, Regional Programs, Other: Agricultural Commissioner

5.2 COMPREHENSIVE PLAN

X	Seismic Safety/Safety Element	X	Conservation Element
X	Agricultural Element	X	Noise Element
X	Land Use Element	X	Circulation Element
	ERME	X	Orcutt Community Plan
X	Energy Element	X	Scenic Highways Element

5.3 OTHER SOURCES

X	Field work	X	Ag Preserve maps
X	Calculations	X	Flood Control maps
X	Project plans	X	Other technical references (reports, survey, etc.)
X	Traffic studies	X	Planning files, maps, reports
X	Records	X	Zoning maps
	Grading plans	X	Soils maps/reports
	Elevation, architectural renderings	X	Plant maps
X	Published geological map/reports	X	Archaeological maps and reports
X	Topographical maps		Other

6.0 PROJECT SPECIFIC *(Short- and Long-term)* AND CUMULATIVE IMPACT SUMMARY

6.1 SIGNIFICANT UNAVOIDABLE IMPACTS

The proposed project would not result in any significant and unavoidable impacts.

6.2 SIGNIFICANT BUT MITIGABLE IMPACTS

The proposed project may result in the following significant impacts; however, implementation of the identified mitigation measures would reduce impacts to a less-than-significant level.

Air Quality. The project may result in the following impacts, which would be mitigated by Mitigation Measure Air-01:

- The violation of any ambient air quality standard, a substantial contribution to an existing or projected air quality violation, or exposure of sensitive receptors to substantial pollutant concentrations (emissions from direct, indirect, mobile and stationary sources).
- Extensive dust generation.

Biological Resources. The project may result in in the following impacts, which would be mitigated by Mitigation Measures Bio-01 through Bio-0~~7~~6:

- An impact on non-native vegetation whether naturalized or horticultural if of habitat value.
- The loss of healthy at least one native specimen tree.
- A reduction in the numbers, a restriction in the range, or an impact to the critical habitat of any unique, rare, threatened or endangered species of animals.
- A reduction in the diversity or numbers of animals on-site (including mammals, birds, reptiles, amphibians, fish, or invertebrates).
- A deterioration of existing fish or wildlife habitat (for foraging, breeding, roosting, nesting, etc.).

Hazardous Materials/Risk of Upset. The project may result in the following impacts, which would be mitigated by Mitigation Measures H-01 and H-02:

- Past uses, storage or discharge of hazardous materials (e.g., fuel or oil stored in underground tanks, pesticides, solvents or other chemicals).
- The creation of a potential public health hazard.

Noise. The project may result in the following impact, which would be mitigated by Mitigation Measure N-01:

- Short-term exposure of people to noise levels exceeding County thresholds.

Public Facilities. The project may result in the following impact, which would be mitigated by Mitigation Measure SolidW-01:

- Significant amounts of solid waste or breach any national, state, or local standards or thresholds relating to solid waste disposal and generation.

Transportation/Circulation. The project would result in the following impact, which would be mitigated by Mitigation Measure Traf-01:

- Increase in traffic hazards to motor vehicles, bicyclists or pedestrians (including short-term construction and long-term operational).

Water Resources/Flooding. The project may result in the following impacts, which would be mitigated by Mitigation Measure Wat-01:

- Discharge, directly or through a storm drain system, into surface waters (including but not limited to wetlands, riparian areas, ponds, springs, creeks, streams, rivers, lakes, estuaries, tidal areas, bays, ocean, etc.) or alteration of surface water quality, including but not limited to temperature, dissolved oxygen, turbidity, or thermal water pollution.
- The substantial degradation of groundwater quality including saltwater intrusion.
- Introduction of storm water pollutants (e.g., oil, grease, pesticides, nutrients, sediments, pathogens, etc.) into groundwater or surface water.

6.3 CUMULATIVE IMPACTS

Cumulative impacts are defined as two or more individual effects which, when considered together are considerable, or which compound or increase other environmental impacts. Under Section 15064 of the CEQA Guidelines, the lead agency (Santa Barbara County Planning and Development Department) must identify cumulative impacts, determine their significance and determine if the effects of the project are cumulatively considerable. Cumulative impacts have been addressed under each issue area. As discussed therein, the proposed project would not result in cumulatively considerable contributions to cumulative impacts.

7.0 MANDATORY FINDINGS OF SIGNIFICANCE

Will the proposal result in:	Poten. Signif.	Less than Signif. with Mitigation	Less Than Signif.	No Impact	Reviewed Under Previous Document
1. Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal, contribute significantly to greenhouse gas emissions or significantly increase energy consumption, or eliminate important examples of the major periods of California history or prehistory?			✓		
2. Does the project have the potential to achieve short-term to the disadvantage of long-term environmental goals?				✓	
3. Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects and the effects of probable future projects.)			✓		
4. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?		✓			
5. Is there disagreement supported by facts, reasonable assumptions predicated upon facts and/or expert opinion supported by facts over the significance of an effect which would warrant investigation in an EIR ?				✓	

1. **Less than significant.** The project does not have the potential to substantially degrade the quality of the environment. As discussed in Section 4.4, *Biological Resources*, the project does not have the potential to substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, or substantially reduce the number or restrict the range of a rare or endangered plant or animal with the implementation of mitigation measures. As discussed in Section 4.3b, *Air Quality – Greenhouse Gas Emissions*, and Section 4.6, *Energy*, the project would not contribute significantly to GHG emissions or significantly increase energy consumption. In addition, as discussed in Section 4.5, *Cultural Resources*, the project would not eliminate important examples of the major periods of California history or prehistory. Therefore, the proposed project would have a less-than-significant impact.

2. **No impact.** The project is designed to improve traffic congestion and provide secondary access to existing development east of U.S. Highway 101. The project does not have the potential to achieve short-term environmental goals to the disadvantage of long-term environmental goals. No impact would occur.

3. **Less than significant.** As discussed in Sections 4.1 through 4.15, the project would have impacts that are individually limited to the study area but are not cumulatively considerable. This impact would be less than significant.
4. **Less than significant with mitigation.** In general, impacts to human beings are associated with such issues as air quality, hazards and hazardous materials, and noise impacts. As detailed in Section 4.3a, *Air Quality*, Section 4.9, *Hazardous Materials/Risk of Upset*, and Section 4.11, *Noise*, construction of the proposed project would have the potential to generate extensive dust and PM_{10} emissions, expose workers and the public to hazardous materials, and result in short-term exposure of people to high noise levels. Therefore, impacts to human beings would be potentially significant. With implementation of Mitigation Measures Air-01, H-01, H-02, and N-01, which require implementation of the County's and SBCAPCD's dust control measures, preparation of a soil assessment and a Contaminated Soil Contingency Plan, and limitation of construction noise to 65 CNEL, the potential impacts would be reduced to less-than-significant levels. Therefore, impacts to human beings would be less than significant with mitigation incorporated under the proposed project.
5. **No impact.** There is no known disagreement supported by facts or any reasonable assumptions predicated upon facts and/or expert opinion supported by facts over the significance of an effect which would warrant investigation in an EIR.

Mitigation and Residual Impact:

The proposed project could result in a potentially significant impacts related to human beings. With implementation of Mitigation Measures Air-01, Bio-01 through Bio-0~~7~~6, H-01, H-02, and N-01, the potential impacts would be reduced to less-than-significant level levels.

8.0 PROJECT ALTERNATIVES

Pursuant to CEQA, project alternatives are only required for projects which would result in significant and immitigable impacts to the environment. Any potentially significant impacts resulting from the proposed Orcutt Community Plan Amendment could be mitigated to less than significant impacts. Therefore, no project alternatives were considered.

9.0 INITIAL REVIEW OF PROJECT CONSISTENCY WITH APPLICABLE SUBDIVISION, ZONING AND COMPREHENSIVE PLAN REQUIREMENTS

Zoning

The proposed project is consistent with the requirements of the County's Land Use and Development Code. The proposed project would not change existing land use designations or zoning. The existing AG-II-100 and CH zoning of the study area allow for roads and streets provided that the applicable permit (e.g., Land Use Permit or Minor Conditional Use Permit) is obtained.

Comprehensive Plan

The project would be subject to all applicable requirements and policies of the County's Comprehensive Plan, including the Orcutt Community Plan. This analysis will be provided in the forthcoming staff report. These policies include but are not limited to the following:

1. Hillside & Watershed Protection Policies #1-7
2. Historical and Archaeological Policies #2, 3, and 5
3. Visual Resource Policy #4
4. Energy Element Policy 4.1
5. Orcutt Community Plan and Key Site 33 policies and development standards

10.0 RECOMMENDATION BY P&D STAFF

On the basis of the Initial Study, the staff of Planning and Development:

_ Finds that the proposed project WILL NOT have a significant effect on the environment and, therefore, recommends that a Negative Declaration (ND) be prepared.

_ Finds that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because the mitigation measures incorporated into the REVISED PROJECT DESCRIPTION would successfully mitigate the potentially significant impacts. Staff recommends the preparation of an ND. The ND finding is based on the assumption that mitigation measures will be acceptable to the project proponent; if not acceptable a revised Initial Study finding for the preparation of an EIR may result.

_ Finds that the proposed project MAY have a significant effect on the environment, and recommends that an EIR be prepared.

_ Finds that from existing documents (previous EIRs, etc.) that a subsequent document (containing updated and site-specific information, etc.) pursuant to CEQA Sections 15162/15163/15164 should be prepared.

Potentially significant unavoidable adverse impact areas:

_With Public Hearing _Without Public Hearing

PREVIOUS DOCUMENT:

PROJECT EVALUATOR:____ DATE:

11.0 DETERMINATION BY ENVIRONMENTAL HEARING OFFICER

_ I agree with staff conclusions. Preparation of the appropriate document may proceed.

_ I DO NOT agree with staff conclusions. The following actions will be taken:

_ I require consultation and further information prior to making my determination.

SIGNATURE:______________________________ **INITIAL STUDY DATE**: ___________________________

SIGNATURE:______________________________ **NEGATIVE DECLARATION DATE**:________________

SIGNATURE:______________________________ **REVISION DATE:** ________________________________

SIGNATURE:______________________________ **FINAL NEGATIVE DECLARATION DATE:** _________

12.0 ATTACHMENTS

1. Conceptual Design Drawings
2. Air Quality and Greenhouse Gas Emissions Modeling Results
3. Biological Resources Reconnaissance Survey Letter Report
4. Potential for Special-Status Species to Occur in Biological Study Area
5. Cultural Resources Assessment Letter Report
6. Energy Calculation Sheets
7. Traffic Impact Study
8. <u>Public Review Period Comment Letters</u>
9. <u>Mitigation Monitoring and Reporting Program</u>

Attachment 1

Conceptual Design Drawings

APN:	SQUARE-FEET:	ACRES:
1. 107-240-008	155,708	3.57
2. 107-240-044	333,922	7.67
3. 107-240-043	63,162	1.45
4. 107-240-027	78,415	1.80
5. 107-240-005	53,240	1.22

ORCUTT COMMUNITY PLAN AMENDMENT

PROPOSED PROJECT: UNION VALLEY PARKWAY EXTENSION - RODEO DRIVE

Attachment 2

Air Quality and Greenhouse Gas Emissions Modeling Results

Orcutt Community Plan Amendment - Proposed Project

Santa Barbara County APCD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
Other Asphalt Surfaces	280.90	1000sqft	6.45	280,900.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.9	**Precipitation Freq (Days)**	37
Climate Zone	4			**Operational Year**	2022
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics - Assumed earlier possible construction start date

Land Use - 5,300 ft in length, 53 feet in width = 280,900 sf

Construction Phase - PER specifies nine-month construction schedule.

Demolition - Approximate estimate of the amount of pavement to be demolished (based on Google Earth approximation) with 2,500 feet in length and 16 feet in width (40,000 sf).

Grading - Preliminary estimate provided by Psomas.

Architectural Coating - SBCAPCD Rule 323

Area Coating - SBCAPCD Rule 323

Off-road Equipment - Increased equipment mix for grading.

Off-road Equipment -

Off-road Equipment -

Trips and VMT - 2 water truck trips per day (4 one-way trips).

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Parking	250.00	150.00
tblAreaCoating	Area_EF_Parking	250	150
tblConstructionPhase	NumDays	20.00	102.00
tblConstructionPhase	NumDays	20.00	44.00
tblGrading	MaterialExported	0.00	42,000.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblTripsAndVMT	VendorTripNumber	0.00	4.00
tblTripsAndVMT	VendorTripNumber	0.00	4.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	0.2956	3.7722	1.8882	5.3400e-003	0.3151	0.1406	0.4557	0.1437	0.1297	0.2734	0.0000	497.6398	497.6398	0.1075	0.0000	500.3284
2021	0.0986	0.3009	0.3528	5.6000e-004	3.5200e-003	0.0159	0.0194	9.4000e-004	0.0147	0.0156	0.0000	49.3826	49.3826	0.0145	0.0000	49.7453
Maximum	**0.2956**	**3.7722**	**1.8882**	**5.3400e-003**	**0.3151**	**0.1406**	**0.4557**	**0.1437**	**0.1297**	**0.2734**	**0.0000**	**497.6398**	**497.6398**	**0.1075**	**0.0000**	**500.3284**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	0.2956	3.7722	1.8882	5.3400e-003	0.3151	0.1406	0.4557	0.1437	0.1297	0.2734	0.0000	497.6394	497.6394	0.1075	0.0000	500.3280
2021	0.0986	0.3009	0.3528	5.6000e-004	3.5200e-003	0.0159	0.0194	9.4000e-004	0.0147	0.0156	0.0000	49.3825	49.3825	0.0145	0.0000	49.7452
Maximum	**0.2956**	**3.7722**	**1.8882**	**5.3400e-003**	**0.3151**	**0.1406**	**0.4557**	**0.1437**	**0.1297**	**0.2734**	**0.0000**	**497.6394**	**497.6394**	**0.1075**	**0.0000**	**500.3280**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	7-1-2020	9-30-2020	1.8265	1.8265
2	10-1-2020	12-31-2020	2.2069	2.2069
3	1-1-2021	3-31-2021	0.4017	0.4017
		Highest	2.2069	2.2069

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0243	2.0000e-005	2.5900e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	5.0200e-003	5.0200e-003	1.0000e-005	0.0000	5.3500e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0243**	**2.0000e-005**	**2.5900e-003**	**0.0000**	**0.0000**	**1.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**1.0000e-005**	**0.0000**	**5.0200e-003**	**5.0200e-003**	**1.0000e-005**	**0.0000**	**5.3500e-003**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0243	2.0000e-005	2.5900e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	5.0200e-003	5.0200e-003	1.0000e-005	0.0000	5.3500e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0243**	**2.0000e-005**	**2.5900e-003**	**0.0000**	**0.0000**	**1.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**1.0000e-005**	**0.0000**	**5.0200e-003**	**5.0200e-003**	**1.0000e-005**	**0.0000**	**5.3500e-003**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	7/1/2020	7/28/2020	5	20	
2	Site Preparation	Site Preparation	7/29/2020	8/11/2020	5	10	
3	Grading	Grading	8/12/2020	12/31/2020	5	102	
4	Paving	Paving	1/1/2021	3/3/2021	5	44	
5	Architectural Coating	Architectural Coating	3/4/2021	3/31/2021	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 22.5

Acres of Paving: 6.45

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 16,854 (Architectural Coating – sqft)

<u>OffRoad Equipment</u>

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Rubber Tired Dozers	2	8.00	247	0.40
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	2	8.00	187	0.41
Grading	Rubber Tired Dozers	2	8.00	247	0.40
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Paving	Pavers	2	8.00	130	0.42
Paving	Paving Equipment	2	8.00	132	0.36
Paving	Rollers	2	8.00	80	0.38
Architectural Coating	Air Compressors	1	6.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	6	15.00	0.00	182.00	8.30	6.40	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	7	18.00	4.00	0.00	8.30	6.40	20.00	LD_Mix	HDT_Mix	HHDT
Grading	6	15.00	4.00	5,250.00	8.30	6.40	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	8.30	6.40	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	24.00	0.00	0.00	8.30	6.40	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0201	0.0000	0.0201	3.0500e-003	0.0000	3.0500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0331	0.3320	0.2175	3.9000e-004		0.0166	0.0166		0.0154	0.0154	0.0000	33.9986	33.9986	9.6000e-003	0.0000	34.2386
Total	**0.0331**	**0.3320**	**0.2175**	**3.9000e-004**	**0.0201**	**0.0166**	**0.0367**	**3.0500e-003**	**0.0154**	**0.0185**	**0.0000**	**33.9986**	**33.9986**	**9.6000e-003**	**0.0000**	**34.2386**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	7.5000e-004	0.0279	8.1100e-003	7.0000e-005	1.5500e-003	1.1000e-004	1.6600e-003	4.3000e-004	1.1000e-004	5.3000e-004	0.0000	7.1225	7.1225	6.5000e-004	0.0000	7.1388
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.8000e-004	4.1000e-004	3.5600e-003	1.0000e-005	9.3000e-004	1.0000e-005	9.3000e-004	2.5000e-004	1.0000e-005	2.5000e-004	0.0000	0.7567	0.7567	3.0000e-005	0.0000	0.7573
Total	**1.2300e-003**	**0.0283**	**0.0117**	**8.0000e-005**	**2.4800e-003**	**1.2000e-004**	**2.5900e-003**	**6.8000e-004**	**1.2000e-004**	**7.8000e-004**	**0.0000**	**7.8791**	**7.8791**	**6.8000e-004**	**0.0000**	**7.8961**

3.2 Demolition - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0201	0.0000	0.0201	3.0500e-003	0.0000	3.0500e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0331	0.3320	0.2175	3.9000e-004		0.0166	0.0166		0.0154	0.0154	0.0000	33.9986	33.9986	9.6000e-003	0.0000	34.2385
Total	**0.0331**	**0.3320**	**0.2175**	**3.9000e-004**	**0.0201**	**0.0166**	**0.0367**	**3.0500e-003**	**0.0154**	**0.0185**	**0.0000**	**33.9986**	**33.9986**	**9.6000e-003**	**0.0000**	**34.2385**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	7.5000e-004	0.0279	8.1100e-003	7.0000e-005	1.5500e-003	1.1000e-004	1.6600e-003	4.3000e-004	1.1000e-004	5.3000e-004	0.0000	7.1225	7.1225	6.5000e-004	0.0000	7.1388
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.8000e-004	4.1000e-004	3.5600e-003	1.0000e-005	9.3000e-004	1.0000e-005	9.3000e-004	2.5000e-004	1.0000e-005	2.5000e-004	0.0000	0.7567	0.7567	3.0000e-005	0.0000	0.7573
Total	**1.2300e-003**	**0.0283**	**0.0117**	**8.0000e-005**	**2.4800e-003**	**1.2000e-004**	**2.5900e-003**	**6.8000e-004**	**1.2000e-004**	**7.8000e-004**	**0.0000**	**7.8791**	**7.8791**	**6.8000e-004**	**0.0000**	**7.8961**

3.3 Site Preparation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0903	0.0000	0.0903	0.0497	0.0000	0.0497	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0204	0.2121	0.1076	1.9000e-004		0.0110	0.0110		0.0101	0.0101	0.0000	16.7153	16.7153	5.4100e-003	0.0000	16.8505
Total	**0.0204**	**0.2121**	**0.1076**	**1.9000e-004**	**0.0903**	**0.0110**	**0.1013**	**0.0497**	**0.0101**	**0.0598**	**0.0000**	**16.7153**	**16.7153**	**5.4100e-003**	**0.0000**	**16.8505**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	8.0000e-005	2.2200e-003	7.8000e-004	0.0000	1.2000e-004	1.0000e-005	1.3000e-004	3.0000e-005	1.0000e-005	4.0000e-005	0.0000	0.4665	0.4665	4.0000e-005	0.0000	0.4674
Worker	2.9000e-004	2.4000e-004	2.1400e-003	1.0000e-005	5.6000e-004	0.0000	5.6000e-004	1.5000e-004	0.0000	1.5000e-004	0.0000	0.4540	0.4540	2.0000e-005	0.0000	0.4544
Total	**3.7000e-004**	**2.4600e-003**	**2.9200e-003**	**1.0000e-005**	**6.8000e-004**	**1.0000e-005**	**6.9000e-004**	**1.8000e-004**	**1.0000e-005**	**1.9000e-004**	**0.0000**	**0.9205**	**0.9205**	**6.0000e-005**	**0.0000**	**0.9218**

3.3 Site Preparation - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0903	0.0000	0.0903	0.0497	0.0000	0.0497	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0204	0.2121	0.1076	1.9000e-004		0.0110	0.0110		0.0101	0.0101	0.0000	16.7153	16.7153	5.4100e-003	0.0000	16.8505
Total	**0.0204**	**0.2121**	**0.1076**	**1.9000e-004**	**0.0903**	**0.0110**	**0.1013**	**0.0497**	**0.0101**	**0.0598**	**0.0000**	**16.7153**	**16.7153**	**5.4100e-003**	**0.0000**	**16.8505**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	8.0000e-005	2.2200e-003	7.8000e-004	0.0000	1.2000e-004	1.0000e-005	1.3000e-004	3.0000e-005	1.0000e-005	4.0000e-005	0.0000	0.4665	0.4665	4.0000e-005	0.0000	0.4674
Worker	2.9000e-004	2.4000e-004	2.1400e-003	1.0000e-005	5.6000e-004	0.0000	5.6000e-004	1.5000e-004	0.0000	1.5000e-004	0.0000	0.4540	0.4540	2.0000e-005	0.0000	0.4544
Total	**3.7000e-004**	**2.4600e-003**	**2.9200e-003**	**1.0000e-005**	**6.8000e-004**	**1.0000e-005**	**6.9000e-004**	**1.8000e-004**	**1.0000e-005**	**1.9000e-004**	**0.0000**	**0.9205**	**0.9205**	**6.0000e-005**	**0.0000**	**0.9218**

3.4 Grading - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1508	0.0000	0.1508	0.0763	0.0000	0.0763	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2157	2.3693	1.2886	2.5500e-003		0.1095	0.1095		0.1008	0.1008	0.0000	224.0528	224.0528	0.0725	0.0000	225.8644
Total	**0.2157**	**2.3693**	**1.2886**	**2.5500e-003**	**0.1508**	**0.1095**	**0.2604**	**0.0763**	**0.1008**	**0.1770**	**0.0000**	**224.0528**	**224.0528**	**0.0725**	**0.0000**	**225.8644**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0216	0.8034	0.2338	2.0300e-003	0.0447	3.2600e-003	0.0480	0.0123	3.1100e-003	0.0154	0.0000	205.4561	205.4561	0.0189	0.0000	205.9275
Vendor	8.2000e-004	0.0226	7.9100e-003	5.0000e-005	1.1900e-003	1.2000e-004	1.3100e-003	3.4000e-004	1.2000e-004	4.6000e-004	0.0000	4.7583	4.7583	3.6000e-004	0.0000	4.7673
Worker	2.4600e-003	2.0700e-003	0.0182	4.0000e-005	4.7200e-003	3.0000e-005	4.7600e-003	1.2600e-003	3.0000e-005	1.2800e-003	0.0000	3.8590	3.8590	1.3000e-004	0.0000	3.8622
Total	**0.0249**	**0.8281**	**0.2599**	**2.1200e-003**	**0.0506**	**3.4100e-003**	**0.0541**	**0.0139**	**3.2600e-003**	**0.0171**	**0.0000**	**214.0734**	**214.0734**	**0.0194**	**0.0000**	**214.5571**

3.4 Grading - 2020

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1508	0.0000	0.1508	0.0763	0.0000	0.0763	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2157	2.3693	1.2886	2.5500e-003		0.1095	0.1095		0.1008	0.1008	0.0000	224.0525	224.0525	0.0725	0.0000	225.8641
Total	**0.2157**	**2.3693**	**1.2886**	**2.5500e-003**	**0.1508**	**0.1095**	**0.2604**	**0.0763**	**0.1008**	**0.1770**	**0.0000**	**224.0525**	**224.0525**	**0.0725**	**0.0000**	**225.8641**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0216	0.8034	0.2338	2.0300e-003	0.0447	3.2600e-003	0.0480	0.0123	3.1100e-003	0.0154	0.0000	205.4561	205.4561	0.0189	0.0000	205.9275
Vendor	8.2000e-004	0.0226	7.9100e-003	5.0000e-005	1.1900e-003	1.2000e-004	1.3100e-003	3.4000e-004	1.2000e-004	4.6000e-004	0.0000	4.7583	4.7583	3.6000e-004	0.0000	4.7673
Worker	2.4600e-003	2.0700e-003	0.0182	4.0000e-005	4.7200e-003	3.0000e-005	4.7600e-003	1.2600e-003	3.0000e-005	1.2800e-003	0.0000	3.8590	3.8590	1.3000e-004	0.0000	3.8622
Total	**0.0249**	**0.8281**	**0.2599**	**2.1200e-003**	**0.0506**	**3.4100e-003**	**0.0541**	**0.0139**	**3.2600e-003**	**0.0171**	**0.0000**	**214.0734**	**214.0734**	**0.0194**	**0.0000**	**214.5571**

3.5 Paving - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0276	0.2842	0.3224	5.0000e-004		0.0149	0.0149		0.0137	0.0137	0.0000	44.0517	44.0517	0.0143	0.0000	44.4078
Paving	8.4500e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0361**	**0.2842**	**0.3224**	**5.0000e-004**		**0.0149**	**0.0149**		**0.0137**	**0.0137**	**0.0000**	**44.0517**	**44.0517**	**0.0143**	**0.0000**	**44.4078**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.8000e-004	8.0000e-004	7.0900e-003	2.0000e-005	2.0400e-003	1.0000e-005	2.0500e-003	5.4000e-004	1.0000e-005	5.5000e-004	0.0000	1.6081	1.6081	5.0000e-005	0.0000	1.6094
Total	**9.8000e-004**	**8.0000e-004**	**7.0900e-003**	**2.0000e-005**	**2.0400e-003**	**1.0000e-005**	**2.0500e-003**	**5.4000e-004**	**1.0000e-005**	**5.5000e-004**	**0.0000**	**1.6081**	**1.6081**	**5.0000e-005**	**0.0000**	**1.6094**

3.5 Paving - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0276	0.2842	0.3224	5.0000e-004		0.0149	0.0149		0.0137	0.0137	0.0000	44.0516	44.0516	0.0143	0.0000	44.4078
Paving	8.4500e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0361**	**0.2842**	**0.3224**	**5.0000e-004**		**0.0149**	**0.0149**		**0.0137**	**0.0137**	**0.0000**	**44.0516**	**44.0516**	**0.0143**	**0.0000**	**44.4078**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.8000e-004	8.0000e-004	7.0900e-003	2.0000e-005	2.0400e-003	1.0000e-005	2.0500e-003	5.4000e-004	1.0000e-005	5.5000e-004	0.0000	1.6081	1.6081	5.0000e-005	0.0000	1.6094
Total	**9.8000e-004**	**8.0000e-004**	**7.0900e-003**	**2.0000e-005**	**2.0400e-003**	**1.0000e-005**	**2.0500e-003**	**5.4000e-004**	**1.0000e-005**	**5.5000e-004**	**0.0000**	**1.6081**	**1.6081**	**5.0000e-005**	**0.0000**	**1.6094**

3.6 Architectural Coating - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0586					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.1900e-003	0.0153	0.0182	3.0000e-005		9.4000e-004	9.4000e-004		9.4000e-004	9.4000e-004	0.0000	2.5533	2.5533	1.8000e-004	0.0000	2.5576
Total	**0.0608**	**0.0153**	**0.0182**	**3.0000e-005**		**9.4000e-004**	**9.4000e-004**		**9.4000e-004**	**9.4000e-004**	**0.0000**	**2.5533**	**2.5533**	**1.8000e-004**	**0.0000**	**2.5576**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.1000e-004	5.8000e-004	5.1500e-003	1.0000e-005	1.4800e-003	1.0000e-005	1.4900e-003	3.9000e-004	1.0000e-005	4.0000e-004	0.0000	1.1695	1.1695	4.0000e-005	0.0000	1.1705
Total	**7.1000e-004**	**5.8000e-004**	**5.1500e-003**	**1.0000e-005**	**1.4800e-003**	**1.0000e-005**	**1.4900e-003**	**3.9000e-004**	**1.0000e-005**	**4.0000e-004**	**0.0000**	**1.1695**	**1.1695**	**4.0000e-005**	**0.0000**	**1.1705**

3.6 Architectural Coating - 2021

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0586					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.1900e-003	0.0153	0.0182	3.0000e-005		9.4000e-004	9.4000e-004		9.4000e-004	9.4000e-004	0.0000	2.5533	2.5533	1.8000e-004	0.0000	2.5576
Total	**0.0608**	**0.0153**	**0.0182**	**3.0000e-005**		**9.4000e-004**	**9.4000e-004**		**9.4000e-004**	**9.4000e-004**	**0.0000**	**2.5533**	**2.5533**	**1.8000e-004**	**0.0000**	**2.5576**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.1000e-004	5.8000e-004	5.1500e-003	1.0000e-005	1.4800e-003	1.0000e-005	1.4900e-003	3.9000e-004	1.0000e-005	4.0000e-004	0.0000	1.1695	1.1695	4.0000e-005	0.0000	1.1705
Total	**7.1000e-004**	**5.8000e-004**	**5.1500e-003**	**1.0000e-005**	**1.4800e-003**	**1.0000e-005**	**1.4900e-003**	**3.9000e-004**	**1.0000e-005**	**4.0000e-004**	**0.0000**	**1.1695**	**1.1695**	**4.0000e-005**	**0.0000**	**1.1705**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Other Asphalt Surfaces	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Other Asphalt Surfaces	6.60	5.50	6.40	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Other Asphalt Surfaces	0.563532	0.028682	0.205515	0.123285	0.020921	0.005572	0.017481	0.019425	0.002786	0.002265	0.006886	0.002647	0.001003

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Mitigated	0.0243	2.0000e-005	2.5900e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	5.0200e-003	5.0200e-003	1.0000e-005	0.0000	5.3500e-003
Unmitigated	0.0243	2.0000e-005	2.5900e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	5.0200e-003	5.0200e-003	1.0000e-005	0.0000	5.3500e-003

6.2 Area by SubCategory

Unmitigated

SubCategory	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Architectural Coating	5.8600e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0182					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	2.4000e-004	2.0000e-005	2.5900e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	5.0200e-003	5.0200e-003	1.0000e-005	0.0000	5.3500e-003
Total	**0.0243**	**2.0000e-005**	**2.5900e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**	**0.0000**	**5.0200e-003**	**5.0200e-003**	**1.0000e-005**	**0.0000**	**5.3500e-003**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	5.8600e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0182					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	2.4000e-004	2.0000e-005	2.5900e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005	0.0000	5.0200e-003	5.0200e-003	1.0000e-005	0.0000	5.3500e-003
Total	**0.0243**	**2.0000e-005**	**2.5900e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**	**0.0000**	**5.0200e-003**	**5.0200e-003**	**1.0000e-005**	**0.0000**	**5.3500e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Attachment 3

Biological Resources Reconnaissance Survey Letter Report

Rincon Consultants, Inc.

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February 20, 2020

Project Number: 19-07442

Mark Friedlander, Planner III
County of Santa Barbara
Planning and Development Department
Long Range Planning Division
123 East Anapamu Street
Santa Barbara, California 93101
Via email: mfriedlander@co.santa-barbara.ca.us

Subject: Biological Resources Reconnaissance Survey Results for the Orcutt Community Plan Amendment Project, Santa Barbara County, California

Dear Mr. Friedlander:

Rincon Consultants, Inc. (Rincon) is pleased to submit the results of a biological resources reconnaissance survey conducted on December 12, 2019 for the proposed Orcutt Community Plan Amendment Project (project), located in northern Santa Barbara County, California (Figure 1 in Attachment A). The survey was conducted to document the existing biological conditions within the biological survey area for the project (Figure 2 in Attachment A).

Biological Survey Area Location

The biological survey area is located in unincorporated Santa Barbara County, California, within the *Santa Maria, California* 7.5-minute U.S. Geographic Survey (USGS) topographic quadrangle (Figures 1 and 2 in Attachment A). The biological survey area is located just northeast of the community of Orcutt, and is within the Orcutt Community Plan Area. The biological survey area is located in Key Site 33 of the Orcutt Community Plan Area and includes portions of U.S. Highway 101, Rodeo Drive, Morningside Drive, Santa Maria Way, and Union Valley Parkway, as well as areas covered with non-native grassland, agricultural land, developed land, and ruderal habitat to the east of U.S. Highway 101. The biological survey area is composed of the following parcels: Assessor's Parcel Numbers (APNs) 107-150-007, 107-150-015, 107-150-016, 107-150-018, 107-150-021, 107-150-022, 107-240-005, 107-240-008, 107-240-027, 107-240-043, 107-240-044, and 107-300-036.

Methods

Prior to the biological resources reconnaissance site visit, relevant literature reviews were conducted to obtain initial information about the biological survey area. These resources included the National Wetlands Inventory (United States Fish and Wildlife Service [USFWS] 2019), National Hydrography Dataset (USGS 2019), the United States Department of Agriculture, Natural Resources Conservation Service (USDA-NRCS) Web Soil Survey (USDA-NRCS 2018), and other existing studies and maps. After completion of the initial literature review, a field survey was completed on December 12, 2019 by

Rincon Biologist Heather Curran. The survey was conducted to evaluate the existing site conditions and document the occurrence of sensitive biological resources within the biological survey area, if observed. The biological survey area was photographed (Attachment B) and vegetation communities were classified based on the vegetation classification system presented in *A Manual of California Vegetation*, Second Edition (Sawyer et al. 2009). In addition, drainages and wetlands were noted, if present. Any sensitive biological resources identified during the survey were recorded and are explained in further detail in the Results section of this letter report.

Conditions were mostly clear during the survey, with 5 percent cloud cover, temperatures ranging from 64 to 66 degrees Fahrenheit, and 5 to 13 mile per hour winds from the northwest. The survey was conducted on foot, with the aid of binoculars to ensure 100 percent visual coverage of the biological survey area. All animal and plant species observed within the biological survey area were recorded, as well as all vegetation communities and any sign (e.g., scat, tracks, burrows/dens, etc.) of special-status animal species. Wildlife identification and nomenclature followed standard reference texts, including *Sibley Birds West: Field Guide to Birds of Western North America* (Sibley 2016) and *Mammals of North America* (Bowers et al. 2004). A compendium of all plant and animal species observed during the reconnaissance survey are listed in Attachment C.

Results

Physical Setting and Topography

The biological survey area is located in the Santa Maria Valley in northwestern Santa Barbara County, California. According to the Western Regional Climate Center data records, between 1895 and 2016, average annual temperatures in Santa Maria ranged between 47 and 69 degrees Fahrenheit, with the warmest temperatures occurring between July and September and the coldest temperatures occurring between November and February. Santa Maria receives an average rainfall of approximately 14.6 inches, with the most rain occurring between November and February (Western Regional Climate Center 2016).

The biological survey area contains generally flat ground and small hills, with elevations ranging from 114 meters (374 feet) to 159 meters (521 feet) above mean sea level. The biological survey area consists primarily of agricultural land, developed and landscaped parcels, and non-native perennial grassland. Adjacent land use includes U.S. Highway 101 to the west, agricultural fields to the north and east, and residential neighborhoods to the south and west.

Watersheds and Drainages

The biological survey area is located approximately 1.3 miles northeast of Orcutt Creek within the Santa Maria River Watershed (Hydrologic Unit Code 18060008). The Santa Maria River Watershed is located in southern San Luis Obispo and northern Santa Barbara counties, and includes the major tributaries of the Cuyama and Sisquoc Rivers, as well as a number of smaller tributaries. The Santa Maria River is formed by the confluence of the Cuyama and Sisquoc Rivers, and Orcutt Creek flows into the Santa Maria River near its mouth at the Santa Maria River estuary.

No wetlands or drainages are mapped within the biological survey area by the National Wetlands Inventory (USFWS 2019) or the National Hydrography Dataset (USGS 2019). Two culverts constructed for the purpose of diverting storm water away from paved roads occur within the biological survey area.

One culvert is located at approximately latitude 34.886442°/longitude -120.413855°, beneath Rodeo Drive near Founders Avenue. The second culvert is located at approximately latitude 34.880727°/longitude -120.407771°, just north of Union Valley Parkway on the east side of U.S. Highway 101, at the bottom of what appears to be a constructed storm water collection basin. Neither culvert is associated with a natural drainage. The culvert direct stormwater runoff from paved roadways and constructed roadside swales. No water was observed in these swales at the time of the reconnaissance survey. Vegetation in these swales did not diverge from surrounding land cover types and consisted primarily of non-native grasses.

At the time of the site visit, water was observed ponding at approximately latitude 34.882552°/ longitude -120.405574°, beneath a row of planted eucalyptus trees along the border of a recently graded agricultural field. No other vegetation was observed beneath the eucalyptus trees, and the ponded area appears to have been previously graded and the area used for vehicle and equipment parking. The ponded area was downslope of the recently graded agricultural field and was formed by previous grading activities and accumulation of recent rainwater runoff from rain events within the last two weeks prior to the reconnaissance visit. The maximum water depth in the ponded area was less than six inches at the time of the reconnaissance survey.

Neither the two culverted areas nor the ponded location within the biological survey area appear to be associated with naturally occurring waterways; therefore, it is unlikely that they are under the jurisdiction of the U.S. Army Corps of Engineers, Regional Water Quality Control Board, and/or California Department of Fish and Wildlife. It should be noted that a formal jurisdictional delineation was not performed as part the reconnaissance survey on December 12, 2019 and that final jurisdictional determinations are at the final discretion of the applicable resource agency.

Soils

Four soil map units are documented within the biological survey area: Oceano sand, 2 to 15 percent slopes; Marina sand, 0 to 2 percent slopes; Marina sand, 2 to 9 percent slopes; and Marina sand, 9 to 30 percent slopes (USDA-NRCS 2019). Descriptions of the soil map units are presented below.

- **Oceano sand, 2 to 15 percent slopes**, is an excessively drained soil that occurs in dunes. It is derived from Eoilian sands and has a typically homogeneous soil profile of sand to 80 inches. Oceano sand has a high to very high capacity to transmit water and low available water storage.
- **Marina sand, 0 to 2 percent slopes, 2 to 9 percent slopes**, **and 9 to 30 percent slopes**, are somewhat excessively drained soils that occur on terraces. Marina sand is derived from Eolian deposits and has a typically homogeneous soil profile of sand to 88 inches. Marina sand has a moderately high to high capacity to transmit water and low available water storage.

Vegetation Communities and Land Cover Types

No native grasslands or other rare or sensitive vegetation communities or habitat types were observed within the biological survey area during the reconnaissance survey. The biological survey area contains four vegetation communities and land cover types: non-native perennial grassland, developed, agricultural, and ruderal. These communities and land cover types are described below.

Non-Native Perennial Grassland

This community is the most abundant non-developed land cover type within the biological survey area. It is dominated by the non-native perennial veldt grass (*Ehrharta calycina*), and occurs in a patchy distribution throughout the northern portion of the biological survey area and is predominant in the southeast portion of the biological survey area. Other non-native plant species found in this community include a windrow of planted blue gum trees (*Eucalyptus globulus*), Russian thistle (*Salsola* spp.), coastal heron's bill (*Erodium cicutarium*), and black mustard (*Brassica nigra*). Individual native shrubs were also present amidst the non-native grassland, although not at a density that meets the criteria for designation as native scrub vegetation communities. These native shrubs include coyote brush (*Baccharis pilularis*), deerweed (*Acmispon glaber*), mock heather (*Ericameria ericoides*), and dune bush lupine (*Lupinus chamissonis*). Native telegraph weed (*Heterotheca grandiflora)* and whiteplume wirelettuce (*Stephanomeria exigua*) were also common throughout this community and adjacent to disturbed areas. Given that this community type is not naturally occurring, it is not described in *A Manual of California Vegetation, Second Edition* (Sawyer et al. 2009) classification system.

Developed

The developed land cover type includes areas that have been heavily disturbed or altered from natural vegetation. Developed portions of the biological survey area include existing roads, commercial buildings and their surrounding landscaping, recreational areas, and an active construction site for the Santa Maria Joint Union High School District's Agricultural Education and Career Technical Center. Landscaped portions of the biological survey area contain a variety of planted species, including coast live oak (*Quercus agrifolia*), Monterey cypress (*Hesperocyparis macrocarpa*), Deodar cedar (*Cedrus deodara*), blue gum eucalyptus, and blood red trumpet vine (*Distictis buccinatoria*). Given that this land cover type is not naturally occurring, it is not described in *A Manual of California Vegetation, Second Edition* (Sawyer et al. 2009) classification system.

Agricultural

Agricultural land is dominant in the northern and eastern portions of the biological survey area and consists of tilled and graded soils for crop production. Agricultural areas in the southeastern portion of the biological survey area also contained hoop structures for blackberry production. A windrow of planted blue gums is also present along the border of an agricultural area in the southeastern portion of the biological survey area. Given that this land cover type is not naturally occurring, it is not described in *A Manual of California Vegetation, Second Edition* (Sawyer et al. 2009) classification system.

Ruderal

This land cover type consists of primarily non-native vegetation growing in heavily disturbed areas, such as roadsides. Within the biological survey area, ruderal land can be found along U.S. Highway 101 and Rodeo Drive. Vegetation within this land cover type includes invasive plant species such as black mustard (*Brassica nigra*), perennial mustard (*Hirschfeldia incana*), Russian thistle (*Salsola kali*), and non-native annual grasses. Some native species also occur within these areas, such as telegraph weed and deerweed. Given that this land cover type is not naturally occurring, it is not described in *A Manual of California Vegetation, Second Edition* (Sawyer et al. 2009) classification system.

Wildlife Species

Wildlife observed during the reconnaissance survey consisted primarily of bird species. A black-tailed jackrabbit (*Lepus californicus*) was the only mammalian species observed during the survey, but tracks of other mammals, including mule deer (*Odocoileus hemionus*), coyote (*Canus latrans*), and grey fox (*Urocyon cinereoargenteus*), were observed within the biological survey area. A complete list of all animal species observed during the reconnaissance survey is included in Attachment C.

A red-tailed hawk (*Buteo jamaicensis*) nest was observed in the southeastern portion of the biological survey area. The nest sits in a blue gum tree on the edge of non-native perennial grassland to the west of U.S. Highway 101 at approximately latitude 34.883273°/ longitude -120.408587°. The nest did not appear to be active (no eggs or nestlings were observed) at the time of the reconnaissance survey; however, two adult red-tailed hawks were present near the nest throughout the duration of the survey, and it is likely that the nest will become active in the coming months. Red-tailed hawks typically breed from March through July, with the breeding season peaking in May and June. Eggs are typically laid in March and April, are incubated an average of 28 to 32 days, and young typically fledge 40 to 45 days after hatching (Zeiner et al. 1988-1990).

Closing

Thank you for the opportunity to continue to work with you on this important project. Please contact us if you have questions concerning the contents of this letter report.

Sincerely,
Rincon Consultants, Inc.

Heather Price Curran, M.S.	Michael Tom, M.S.
Associate Biologist	Senior Biologist

Attachments

Attachment A	Figures
Attachment B	Site Photographs
Attachment C	Floral and Faunal Compendium

References

Baldwin, B.G., D.H. Goldman, D.J. Keil, R. Patterson, T.J. Rosatti, D.H. Wilken, eds. 2012. The Jepson Manual: Vascular Plants of California, Second Edition, Thoroughly Revised and Expanded. University of California Press. Berkeley, California.

Bowers, N., R. Bowers, and K. Kaufman. 2004. Mammals of North America.

Calflora. 2019. Information on wild California plants for conservation, education, and appreciation. Berkeley, CA. Updated online and accessed via: www.calflora.org.

Sawyer, J.O., T. Keeler-Wolf, and J.M. Evens. 2009. A Manual of California Vegetation, Second Edition. California Native Plant Society, Sacramento, California.

Sibley. 2016. Sibley Birds West: Field Guide to Birds of Western North America. Knopf; second edition.

United States Department of Agricultural, Natural Resources Conservation Service (USDA-NRCS). 2018. Web Soil Survey. Soil Survey Area: Northern Santa Barbara, California. Soil Survey Data: Version 13, September 12, 2018. Accessed December 2019. Available at: https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm.

United States Fish and Wildlife Service (USFWS). 2019. National Wetlands Inventory. Accessed December 2019 via Wetlands Mapper. Last modified October 8, 2019. Available at: https://www.fws.gov/wetlands/data/Mapper.html.

United States Geological Survey (USGS). 2019. National Hydrography Dataset. Accessed December 2019 via The National Map. Available at: https://viewer.nationalmap.gov/advanced-viewer/.

Western Regional Climate Center. 2016. Climate of California. Accessed December 2019. Available at: www.wrcc.dri.edu/Climate/narrative_ca.php.

Zeiner, D.C., W.F. Laudenslayer, Jr., K.E. Mayer, and M. White, eds. 1988-1990. California's Wildlife. Vol. I-III. California Depart. of Fish and Game, Sacramento, California. Accessed December 2019 through the California Department of Fish and Wildlife website at: https://nrm.dfg.ca.gov.

Attachment A. Figures

Figure 1. Regional Location Map

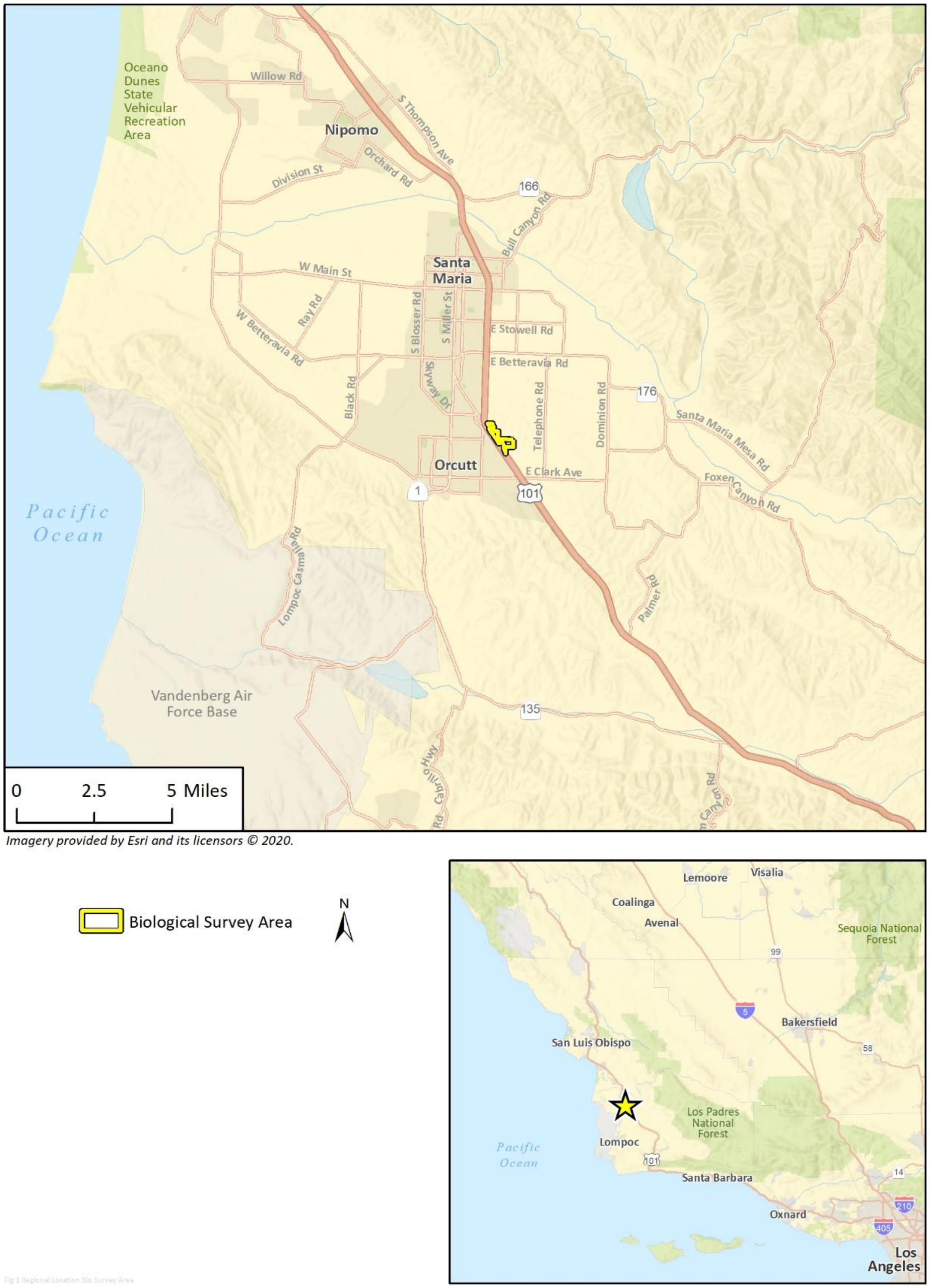
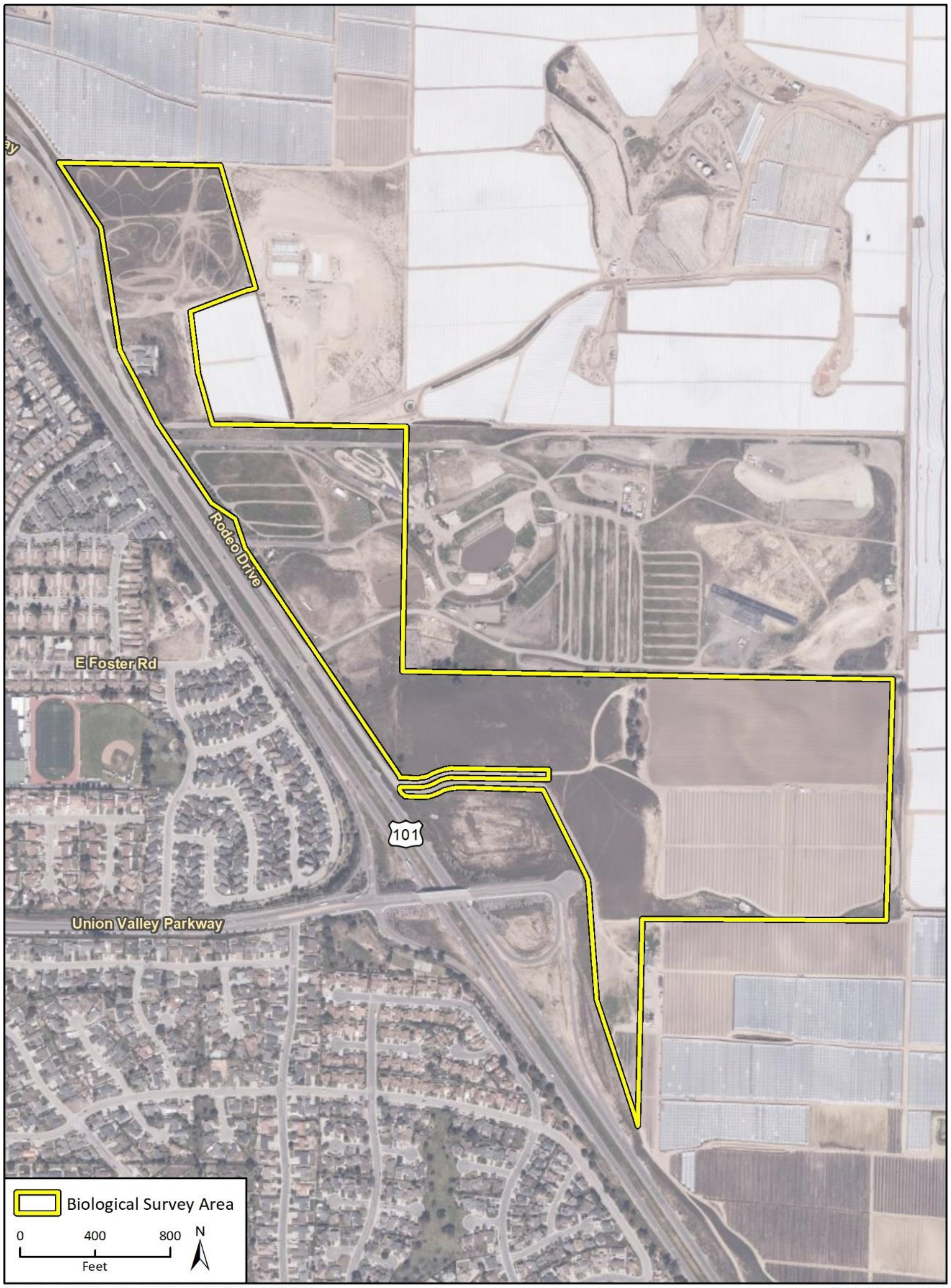


Figure 2. Biological Survey Area



Imagery provided by Microsoft Bing and its licensors © 2020.

Attachment B. Site Photographs

Photo 1: View facing southeast of non-native perennial grassland in the southeastern portion of the biological survey area.

Photo 2: Red-tailed hawk nest located in a eucalyptus tree in the southeastern portion of the biological survey area.

Photo 3: View facing northeast of boundary between grassland and agricultural land in the southeastern portion of the biological survey area. Ponding is visible beneath planted windrow of eucalyptus trees.

Photo 4: View facing southeast of ponding water beneath planted windrow of eucalyptus trees and downslope of a recently graded agricultural field.

Photo 5: View facing northwest of the culvert beneath Rodeo Drive.

Photo 6: View facing south of Union Valley Parkway overpass and constructed stormwater collection basin. A culvert exists at the bottom of the southern end of the basin.

Photo 7: View facing east of disturbed non-native perennial grassland near northeast end of biological survey area. This land is used recreationally by the local community as a BMX and dirt bike track.

Photo 8: View facing east of Rodeo Drive, ruderal roadside vegetation, and landscaped area surrounding the Elks Unocal Event Center located within the biological survey area.

Photo 9: View facing northwest of disturbed and landscaped areas surrounding the Polished Pet business located within the biological survey area.

Photo 10: View facing north of southern portion of Rodeo Drive and adjacent non-native perennial grassland.

Photo 11: View facing east of active construction site for the Agricultural Education and Career Technical Center located near the northeast boundary of the biological survey area.

Photo 12: View facing southwest of U.S. Highway 101 overpass at Santa Maria Way, located near the northern end of the biological survey area.

Attachment C. Floral and Faunal Compendium

Table 1. Plant Species Observed within the Biological Survey Area on December 12, 2019

Family	Scientific Name	Common Name	Status
Anacardiaceae	*Schinus molle*	Peruvian pepper tree	Non-native
Anacardiaceae	*Schinus terebinthifolius*	Brazilian pepper tree	Non-native
Apocynaceae	*Nerium oleander*	Oleander	Invasive
Asteraceae	*Ambrosia psilostachya*	Ragweed	Native
Asteraceae	*Baccharis pilularis*	Coyote brush	Native
Asteraceae	*Carduus pycnocephalus*	Italian thistle	Invasive
Asteraceae	*Ericameria ericoides*	Mock heather	Native
Asteraceae	*Heterotheca grandiflora*	Telegraph weed	Native
Asteraceae	*Pseudognaphalium beneolens*	Cudweed	Native
Asteraceae	*Stephanomeria exigua*	Whiteplume wirelettuce	Native
Bignoniaceae	*Distictis buccinatoria*	Blood red trumpet vine	Non-native
Bignoniaceae	*Jacaranda mimosifolia*	Blue Jacaranda tree	Non-native
Brassicaceae	*Brassica nigra*	Black mustard	Invasive
Brassicaceae	*Hirschfeldia incana*	Perennial mustard	Invasive
Brassicaceae	*Raphanus sativus*	Wild radish	Invasive
Chenopodiaceae	*Salsola kali*	Russian thistle	Invasive
Chenopodiaceae	*Salsola tragus* ssp. *tragus*	Slender saltwort	Invasive
Cupressaceae	*Hesperocyparis macrocarpa*	Monterey cypress	Native
Euphorbiaceae	*Croton californicus*	California croton	Native
Fabaceae	*Acacia longifolia*	Golden wattle	Non-native
Fabaceae	*Acmispon glaber*	Deerweed	Native
Fabaceae	*Lupinus chamissonis*	Dune bush lupine	Native
Fagaceae	*Quercus agrifolia*	Coast live oak	Native
Geraniaceae	*Erodium botrys*	Big heron’s bill	Non-native
Geraniaceae	*Erodium cicutarium*	Coastal heron’s bill	Invasive
Myrtaceae	*Eucalyptus globulus*	Blue gum	Invasive
Pinaceae	*Cedrus deodara*	Deodar cedar	Non-native
Poaceae	*Avena fatua*	wild oats	Invasive
Poaceae	*Bromus* spp.	Brome	Invasive
Poaceae	*Ehrharta calycina*	Perennial veldt grass	Invasive
Rosaceae	*Rubus ursinus*	Blackberry	Cultivated

Note: This survey was conducted outside the bloom period of most sensitive plant species and should not be considered a comprehensive botanical survey.

Table 2. Animal Species Observed within the Biological Survey Area on December 12, 2019

Scientific Name	Common Name	Status
BIRDS		
Buteo jamaicensis	Red-tailed hawk	Native
Calypte anna	Anna's hummingbird	Native
Cathartes aura	Turkey vulture	Native
Charadrius vociferous	Killdeer	Native
Chondestes grammacus	Lark sparrow	Native
Columba livia	Rock pigeon	Non-native
Dryobates nuttallii	Nuttall's woodpecker	Native
Euphagus cyanocephalus	Brewer's blackbird	Native
Falco sparverius	American kestrel	Native
Haemorhous mexicanus	House finch	Native
Passerculus sanwichensis	Savannah sparrow	Native
Sayornis nigricans	Black phoebe	Native
Setophaga coronata	Yellow-rumped warbler	Native
Streptopelia decaocto	Eurasian collared dove	Non-native
Sturnella neglecta	Western meadowlark	Native
Zenaida macroura	Mourning dove	Native
Zonotrichia leucophrys	White-crowned sparrow	Native
MAMMALS		
Lepus californicus	Black-tailed jackrabbit	Native

Attachment 4

Potential for Special-Status Species to Occur in Biological Study Area

Potential for Special-Status Species to Occur in Biological Study Area

Table 1 Special-Status Plant Species within a Five-Mile Radius of the Study Area

Species	Status*	Habitat Requirements	Potential to Occur in the Project Study Area
Agrostis hooveri Hoover's bent grass	None/None 1B.2	Chaparral, cismontane woodland, closed-cone coniferous forest, valley and foothill grassland. Sandy sites. 60 to 765 meters above mean sea level (amsl). Perennial herb. Blooms April through July.	**Low potential.** Marginally suitable habitat present within grasslands.
Amsinckia douglasiana Douglas' fiddleneck	None/None 4.2	Valley and foothill grassland, oak woodland. Monterey shale; dry habitats. 0 to 1,950 meters amsl. Annual herb. Blooms March through May.	**Not Expected.** No suitable habitat present.
Aphanisma blitoides aphanisma	None/None 1B.2	Coastal bluff scrub, coastal dunes, coastal scrub. On bluffs and slopes near the ocean in sandy or clay soils. 3 to 305 meters amsl. Annual herb. Blooms February through June.	**Not Expected.** No suitable habitat present.
Arctostaphylos obispoensis Bishop manzanita	None/None 4.3	Closed-cone coniferous forest, cismontane woodland, chaparral Rocky, serpentine sites. 150 to 1,005 meters amsl. perennial evergreen shrub. Blooms February through June.	**Not Expected.** No suitable habitat present.
Arctostaphylos pilosula Santa Margarita manzanita	None/None 1B.2	Closed-cone coniferous forest, chaparral, broadleafed upland forest, cismontane woodland. Shale outcrops & slopes; reported growing on decomposed granite or sandstone. 60 to 1220 meters amsl. perennial evergreen shrub. Blooms December through May.	**Not Expected.** No suitable habitat present.
Arctostaphylos purissima La Purisima manzanita	None/None 1B.1	Chaparral, coastal scrub. Sandstone outcrops, sandy soil. 60 to 470 meters amsl. Perennial evergreen shrub. Blooms November through May.	**Not Expected.** No suitable habitat present.
Arctostaphylos refugioensis Refugio manzanita	None/None 1B.2	Chaparral. On sandstone. 60 to 765 meters amsl. Perennial evergreen shrub. Blooms December through March (May).	**Not Expected.** No suitable habitat present.
Arctostaphylos rudis sand mesa manzanita	None/None 1B.2	Chaparral, coastal scrub. On sandy soils in Lompoc/Nipomo area. 20 to 335 meters amsl. Perennial evergreen shrub. Blooms November through February.	**Not Expected.** No suitable habitat present.
Arenaria paludicola marsh sandwort	Endangered/ Endangered 1B.1	Marshes and swamps. Growing up through dense mats of Typha, Juncus, Scirpus, etc. in freshwater marsh. Sandy soil. 3 to 170 meters amsl. perennial stoloniferous herb. Blooms May through August.	**Not Expected.** No suitable habitat present.

Species	Status*	Habitat Requirements	Potential to Occur in the Project Study Area
Astragalus didymocarpus var. *milesianus* Miles' milk-vetch	None/None 1B.2	Coastal scrub. Clay soils. 50 to 385 meters amsl. Annual herb. Blooms March through June.	**Not Expected.** No suitable habitat present.
Calochortus obispoensis San Luis mariposa-lily	None/None 1B.2	Chaparral, cismontane woodland, coastal scrub, valley and foothill grassland. Often in serpentine grassland. 15-550 meters amsl. perennial bulbiferous herb. Blooms May through July.	**Not Expected.** No suitable habitat present.
Calystegia subacaulis ssp. *episcopalis* Cambria morning-glory	None/None 4.2	Chaparral, cismontane woodland, coastal prairie, valley and foothill grassland. 5 to 475 meters amsl. Perennial rhizomatous herb. Blooms (March) April through June (July).	**Not Expected.** No suitable habitat present.
Ceanothus cuneatus var. *fascicularis* Lompoc ceanothus	None/None 4.2	Chaparral. Sandy soils. 5 to 400 meters amsl. Perennial evergreen shrub. Blooms February through April.	**Not Expected.** No suitable habitat present.
Castilleja densiflora var. *obispoensis* San Luis Obispo owl's-clover	None/None 1B.2	Valley and foothill grassland, meadows and seeps. Sometimes on serpentine. 10 to 485 meters amsl. Annual herb (hemiparasitic). Blooms March through May.	**Not Expected.** No suitable habitat present.
Chorizanthe rectispina straight-awned spineflower	None/None 1B.3	Chaparral, cismontane woodland, coastal scrub. Often on granite in chaparral. 45 to 1,040 meters amsl. Annual herb. Blooms April through July.	**Not Expected.** No suitable habitat present.
Cirsium scariosum var. *loncholepis* La Graciosa thistle	FE/ST 1B.1	Coastal dunes, coastal scrub, brackish marshes, valley and foothill grassland, cismontane woodland. Lake edges, riverbanks, other wetlands; often in dune areas. Mesic, sandy sites. 4 to 220 meters amsl. Perennial herb. Blooms May through August.	**Not Expected.** No suitable habitat present.
Cladium californicum California sawgrass	None/None 2B.2	Meadows and seeps, marshes and swamps (alkaline or freshwater). Freshwater or alkaline moist habitats. 20 meters below mean sea level to 2,135 meters amsl. Perennial rhizomatous herb. Blooms June through September.	**Not Expected.** No suitable habitat present.
Clarkia speciosa ssp. *immaculata* Pismo clarkia	Endangered/Rare 1B.1	Chaparral, cismontane woodland, valley and foothill grassland. On ancient sand dunes not far from the coast. Sandy soils; openings. 30 to 185 meters amsl. Annual herb. Blooms May through July.	**Not Expected.** No suitable habitat present.

Species	Status*	Habitat Requirements	Potential to Occur in the Project Study Area
Cordylanthus rigidus ssp. *littoralis* seaside bird's-beak	None/SE 1B.1	Closed-cone coniferous forest, chaparral, cismontane woodland, coastal scrub, coastal dunes. Sandy, often disturbed sites, usually within chaparral or coastal scrub. 30 to 520 meters amsl. Annual herb (hemiparasitic). Blooms April through October.	**Not Expected.** No suitable habitat present.
Deinandra increscens ssp. *villosa* Gaviota tarplant	FE/SE 1B.1	Coastal scrub, valley and foothill grassland, coastal bluff scrub. Known from coastal terrace near Gaviota; sandy blowouts amid sandy loam soil; grassland/coast scrub ecotone. 10 to 430 meters amsl. Annual herb. Blooms May through October.	**Not Expected.** Marginally suitable habitat present within grasslands; however, study area is well outside known geographic range for this species.
Deinandra paniculata paniculate tarplant	None/None 4.2	Coastal scrub, valley and foothill grassland, vernal pools. Usually in vernally mesic sites. Sometimes in vernal pools or on mima mounds near them. 25 to 940 meters amsl. Annual herb. Blooms (March) April through November.	**Not Expected.** No suitable habitat present.
Delphinium parryi ssp. *blochmaniae* dune larkspur	None/None 1B.2	Chaparral, coastal dunes (maritime). On rocky areas and dunes. 18 to 305 meters amsl. Perennial herb. Blooms April through June.	**Not Expected.** No suitable habitat present.
Erigeron blochmaniae Blochman's leafy daisy	None/None 1B.2	Coastal dunes, coastal scrub. Sand dunes and hills. 0 to 185 meters amsl. Perennial rhizomatous herb. Blooms June through August.	**Not Expected.** No suitable habitat present.
Eriodictyon capitatum Lompoc yerba santa	FE/CR 1B.2	Closed-cone coniferous forest, chaparral. Sandy soils on terraces. 60 to 505 meters amsl. Perennial evergreen shrub. Blooms May through September.	**Not Expected.** No suitable habitat present.
Horkelia cuneata var. *puberula* mesa horkelia	None/None 1B.1	Chaparral, cismontane woodland, coastal scrub. Sandy or gravelly sites. 15 to 1,645 m amsl. Perennial herb. Blooms February through July (September).	**Not Expected.** No suitable habitat present.
Horkelia cuneata var. *sericea* Kellogg's horkelia	None/None 1B.1	Closed-cone coniferous forest, coastal scrub, coastal dunes, chaparral. Old dunes, coastal sandhills; openings. Sandy or gravelly soils. 5 to 430 meters amsl. Perennial herb. Blooms April through September.	**Not Expected.** No suitable habitat present.
Lonicera subspicata var. *subspicata* Santa Barbara honeysuckle	None/None 1B.2	Chaparral, cismontane woodland, coastal scrub. 5 to 825 meters amsl. Perennial evergreen shrub. Blooms May through August (December through February).	**Not Expected.** No suitable habitat present.

Species	Status*	Habitat Requirements	Potential to Occur in the Project Study Area
Lupinus ludovicianus San Luis Obispo County lupine	None/None 1B.2	Chaparral, cismontane woodland. Open areas in sandy soil, Santa Margarita formation. 85 to 525 meters amsl. Perennial herb. Blooms April through July.	**Not Expected.** No suitable habitat present.
Malacothamnus gracilis slender bush-mallow	None/None 1B.1	Chaparral. Dry, rocky slopes. 150 to 335 meters amsl. perennial deciduous shrub. Blooms May through October.	**Not Expected.** No suitable habitat present.
Malacothamnus jonesii Jones' bush-mallow	None/None 4.3	Chaparral, cismontane woodland. 160 to 825 m amsl. Perennial deciduous shrub. Blooms (March) April through October.	**Not Expected.** No suitable habitat present.
Monardella sinuata ssp. *sinuata* southern curly-leaved monardella	None/None 1B.2	Coastal dunes, coastal scrub, chaparral, cismontane woodland. Sandy soils. 20 to 305 meters amsl. Annual herb. Blooms April through September.	**Not Expected.** No suitable habitat present.
Monardella undulata ssp. *undulata* San Luis Obispo monardella	None/None 1B.2	Coastal dunes, coastal scrub. Stabilized sand of the immediate coast. 5 to 200 meters amsl. Perennial rhizomatous herb. Blooms May through September.	**Not Expected.** No suitable habitat present.
Nasturtium gambelii Gambel's water cress	FE/ST 1B.1	Marshes and swamps. Freshwater and brackish marshes at the margins of lakes and along streams, in or just above the water level. 5 to 330 meters amsl. Perennial rhizomatous herb. Blooms April through October.	**Not Expected.** No suitable habitat present.
Phacelia hubbyi Hubby's phacelia	None/None 4.2	Chaparral, coastal scrub, valley and foothill grassland. Gravelly, rocky areas and talus slopes. 0 to 1,000 meters amsl. Annual herb. Blooms April through July.	**Not Expected.** No suitable habitat present.
Phacelia ramosissima var. *austrolitoralis* south coast branching phacelia	None/None 3.2	Chaparral, coastal scrub, coastal dunes, coastal salt marsh. Sandy, sometimes rocky sites. 5 to 300 meters amsl. Perennial herb. Blooms March through August.	**Not Expected.** No suitable habitat present.
Scrophularia atrata black-flowered figwort	None/None 1B.2	Closed-cone coniferous forest, chaparral, coastal dunes, coastal scrub, riparian scrub. Sand, diatomaceous shales, and soils derived from other parent material; around swales and in sand dunes. 10 to 445 meters amsl. Perennial herb. Blooms March through July.	**Not Expected.** No suitable habitat present.
Senecio blochmaniae Blochman's ragwort	None/None 4.2	Coastal dunes. 0 to 100 meters amsl. Perennial herb. Blooms May through October.	**Not Expected.** No suitable habitat present.

Species	Status*	Habitat Requirements	Potential to Occur in the Project Study Area
Symphyotrichum defoliatum San Bernardino aster	None/None 1B.2	Meadows and seeps, cismontane woodland, coastal scrub, lower montane coniferous forest, marshes and swamps, valley and foothill grassland. Vernally mesic grassland or near ditches, streams and springs; disturbed areas. 2 to 2,040 meters amsl. Perennial rhizomatous herb. Blooms July through November.	**Not Expected.** No suitable habitat present.

***Status:**
Federal Endangered Species Act Listing Code/California Endangered Species Act Listing Code
FE = Federally Endangered SE = State Endangered
FT = Federally Threatened ST = State Threatened
SR = State Rare
SSC = State Species of Special Concern
FP = State Fully Protected

California Native Plant Society California Rare Plant Rank (CRPR)
<u>California Rare Plant Rank</u>
1A = Presumed extinct in California
1B = Rare, threatened, or endangered in California and elsewhere
2A = Plants presumed extirpated in California, but more common elsewhere
2B = Plants rare, threatened, or endangered in California, but more common elsewhere
<u>Threat Code Extension</u>
.1 = Seriously endangered in California (over 80 percent of occurrences threatened/high degree and immediacy of threat)
.2 = Fairly endangered in California (20 to 80 percent occurrences threatened)
.3 = Not very endangered in California (less than 20 percent of occurrences threatened)

Table 2 Special-Status Wildlife Species within a Five-Mile Radius of the Study Area

Species	Status	Habitat Requirements	Potential to Occur in the Project Study Area
Invertebrates			
Branchinecta lynchi vernal pool fairy shrimp	FT/None	Endemic to the grasslands of the Central Valley, Central Coast mountains, and South Coast mountains, in astatic rain-filled pools. Inhabit small, clear-water sandstone-depression pools and grassed swale, earth slump, or basalt-flow depression pools.	**Not Expected.** No suitable habitat present. No vernal pools present.
Danaus plexippus pop. 1 monarch - California overwintering population	None/None	Winter roost sites extend along the coast from northern Mendocino to Baja California, Mexico. Roosts located in wind-protected tree groves (eucalyptus, Monterey pine, cypress), with nectar and water sources nearby.	**Low Potential.** Marginally suitable habitat present within the study area. Trees are present along Morningside Drive; however, they are not located in wind-protected groves with water sources nearby.
Amphibians			
Ambystoma californiense California tiger salamander	FT/ST	Lowlands and foothills in or near permanent sources of deep water with dense, shrubby, or emergent riparian vegetation. Requires 11 to 20 weeks of permanent water for larval development. Must have access to estivation habitat.	**Low Potential.** The Santa Barbara County Distinct Population Segment is endemic to the northern portion of Santa Barbara County, and critical habitat is mapped within 1.0-mile of the study area. The CNDDB documents two occurrences of the species within three miles of the study area. Agricultural detention basins may provide marginally suitable habitat; however, the study area is not within a known dispersal corridor and doesn't contain upland rearing habitat or known breeding ponds. The species may be present if seasonal irrigation ponds and/or if suitable upland aestivation and/or dispersal habitat(s) exist within the study area.
Rana draytonii California red-legged frog	FT/SSC	Lowlands and foothills in or near permanent sources of deep water with dense, shrubby, or emergent riparian vegetation. Requires 11 to 20 weeks of permanent water for larval development. Must have access to estivation habitat.	**Low Potential.** The CNDDB search identified a species occurrence within 1.0-mile of the study area; however, no permanent freshwater bodies are mapped within the study area. Nevertheless, the study area does contain agricultural detention basins that could provide marginal breeding habitat. The species may be present if seasonal irrigation ponds and/or if suitable upland dispersal habitat exist within the study area.

Species	Status	Habitat Requirements	Potential to Occur in the Project Study Area
Spea hammondii western spadefoot	None/SSC	Occurs primarily in grassland habitats but can be found in valley-foothill hardwood woodlands. Vernal pools are essential for breeding and egg-laying.	**Low Potential.** The CNDDB search identified a species occurrence within one-mile of the study area. Although the study area does not contain essential grassland vernal pool habitat, agricultural detention basins that could provide marginal breeding habitat are present.
Reptiles			
Anniella pulchra northern California legless lizard	None/SSC	Sandy or loose loamy soils under sparse vegetation. Soil moisture is essential. They prefer soils with a high moisture content.	**Low Potential.** Suitable habitat (sandy soils, sparse vegetation) present in study area. The CNDDB search identified a species occurrence within 1.0 mile of the project study area; however, the area has been substantially developed since the recorded occurrence.
Emys marmorata western pond turtle	None/SSC	A thoroughly aquatic turtle of ponds, marshes, rivers, streams and irrigation ditches, usually with aquatic vegetation, below 1,829 meters amsl. Needs basking sites and suitable (sandy banks or grassy open fields) upland habitat up to 0.5 kilometers from water for egg-laying.	**Not Expected.** No suitable aquatic habitat present.
Phrynosoma blainvillii coast horned lizard	None/SSC	Frequents a wide variety of habitats, most common in lowlands along sandy washes with scattered low bushes. Open areas for sunning, bushes for cover, patches of loose soil for burial, and abundant supply of ants and other insects.	**Low Potential.** Suitable habitat (open areas with bushes for cover) present in study area.
Birds			
Athene cunicularia burrowing owl	None/SSC	Open, dry annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation. Subterranean nester, dependent upon burrowing mammals, most notably, the California ground squirrel.	**Not Expected.** No suitable nesting habitat present within the study area. The CNDDB recorded two observations within five miles of the study area; however, the species is not expected to breed within the study area.
Falco peregrinus anatum American peregrine falcon	Delisted/Delisted FP	Near wetlands, lakes, rivers, or other water; on cliffs, banks, dunes, mounds; also, human-made structures. Nest consists of a scrape or a depression or ledge in an open site.	**Not Expected.** No suitable habitat (wetlands, lakes, rivers) present within the study area.

Species	**Status**	**Habitat Requirements**	**Potential to Occur in the Project Study Area**
Empidonax traillii extimus southwestern willow flycatcher	FE/SE	Riparian woodlands in southern California.	**Not Expected.** No suitable habitat present. No riparian woodlands present.
Gymnogyps californianus California condor	FE /SE, FP	Require vast expanses of open savannah, grasslands, and foothill chaparral in mountain ranges of moderate altitude. Deep canyons containing clefts in the rocky walls provide nesting sites. Forages up to 100 miles from roost/nest.	**Not Expected.** No suitable habitat present. No deep canyons/high mountains are present in the general vicinity.
Vireo bellii pusillus least Bell's vireo	FE/SE	Summer resident of southern California in low riparian areas in vicinity of water or in dry river bottoms; below 610 meters amsl. Nests placed along margins of bushes or on twigs projecting into pathways, usually willow, Baccharis, mesquite.	**Not Expected.** No suitable habitat present. No riparian habitat present.
Mammals			
Taxidea taxus American badger	None/SSC	Most abundant in drier open stages of most shrub, forest, and herbaceous habitats with friable soils. Needs sufficient food, friable soils and open, uncultivated ground. Preys on burrowing rodents. Digs burrows.	**Low Potential.** Open, disturbed ground is present in the eastern project area. Project study area may contain rodent burrows. The CNDDB search identified a species occurrence within 1.0 mile of the project study area.

*Status:
Federal Endangered Species Act Listing Code/California Endangered Species Act Listing Code
FE = Federally Endangered SE = State Endangered
FT = Federally Threatened ST = State Threatened
SR = State Rare
SSC = State Species of Special Concern
FP = State Fully Protected

Attachment 5

Cultural Resources Assessment Letter Report

Rincon Consultants, Inc.

209 East Victoria Street
Santa Barbara, California 93101

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February 20, 2020

Project Number: 19-07442

Mark Friedlander, Planner III
County of Santa Barbara
Planning and Development Department
Long Range Planning Division
123 East Anapamu Street
Santa Barbara, California 93101
Via email: mfriedlander@co.santa-barbara.ca.us

Subject: Cultural Resources Assessment for the Orcutt Community Plan Amendment Project, Community of Orcutt, Santa Barbara County, California

Dear Mr. Friedlander:

Rincon Consultants, Inc. (Rincon) conducted a cultural resources assessment of the proposed Orcutt Community Plan Amendment Project (project) located in the community of Orcutt, Santa Barbara County, California. The purpose of this assessment is to document the results of the cultural resources tasks performed by Rincon staff, including a cultural resources records search, archival research, and a pedestrian survey of the study area for the project. The project is subject to the California Environmental Quality Act (CEQA), and the County of Santa Barbara (County) is the CEQA lead agency. The County fulfilled the Native American consultation requirements under California Government Code Sections 65352.3 and 65352.4 (Senate Bill 18) and Public Resources Code (CEQA) Section 21080.3.1 (Assembly Bill 52) for the project. The project would involve an amendment to the Orcutt Community Plan to include a new local road connection between the Union Valley Parkway/U.S. Highway 101 interchange and the adjoining frontage road (commonly referred to as Rodeo Drive) on the east side of U.S. Highway 101.

Study Area Location

The study area is located within the Santa Maria Valley in the unincorporated community of Orcutt, Santa Barbara County, California (Figure 1 in Attachment A). The study area is depicted on Township 09S, Range 34W, Sections 01, 02, and 12, and Township 10N, Range 34W, Sections 35 and 36 of the United States Geological Survey (USGS) *Santa Maria* CA 7.5-minute quadrangle (Figure 2 in Attachment A).

The study area is east of U.S. Highway 101 and includes portions of Key Site 33 in the Orcutt Community Plan. The study area is approximately 74 acres with a mix of existing uses, including agriculture, a pet grooming business, and the Elks Unocal Event Center (Elks facility). To the north of the study area are a pet grooming business, agricultural land uses, and the currently-under-construction Santa Maria Joint Union High School District Agricultural Education and Career Technical Center. To the east and south of the study area are agricultural land uses, and to the west of the study area is U.S. Highway 101.

Environmental Setting

The study area is located on stabilized sand dune deposits in the Santa Maria Valley. The study area generally slopes from northwest to southeast and ranges in elevation from approximately 366 to 530 feet (112 to 162 meters) above mean sea level. The study area is bounded by agricultural activities, U.S. Highway 101, and a rodeo/event facility (Figure 3 in Attachment A). The nearest water source is the Cuyama River, approximately 4.7 miles (7.6 kilometers) to the northeast. The soils in the study area include an Oceano-Marina sand complex that consists of deep, excessively drained soils that formed in material weathered from sandy eolian deposits (California Soil Resource Lab 2019). Vegetation within the study area consists primarily of seasonal grasses.

California Historical Resources Information System

Rincon completed a California Historical Resources Information System records search on September 30, 2019, at the Central Coast Information Center (CCIC) located at the University of California, Santa Barbara. The purpose of the records search was to identify previously recorded cultural resources, as well as previously conducted cultural resources studies of the study area plus a 0.25-mile radius. The search also included a review of the National Register of Historic Places (NRHP), the California Register of Historical Resources (CRHR), the California Historical Landmarks list, the Archaeological Determination of Eligibility (ADOE) list, and the California State Historic Resources Inventory (HRI) list. Results from the records search are included in Attachment B.

The CCIC records search identified 16 previously conducted cultural resource studies within a 0.25-mile radius of the study area (Table 1). Of these, nine studies (SR-00319, SR-04451, SR-04603, SR-04603A, SR-04603B, SR-04603C, SR-04603D, SR-04603E, and SR-04605) include approximately 60 percent of the study area. Brief descriptions of the available studies are provided below. As discussed, the CCIC records search did not identify any previously recorded cultural resources within a 0.25-mile radius of the study area.

Table 1 Previous Cultural Resources Studies within 0.25 Mile of the Study Area

Report Number	Author	Year	Study	Relationship to Study Area
SR-00319	Spanne, Laurence W.	1979	*An Archaeological Evaluation for the "Orcutt 13" Residential Developments, County of Santa Barbara*	**Within**
SR-00325	Spanne, Laurence W.	1980	*An Archaeological Evaluation for Tract No. 12,995 Orcutt, California, County of Santa Barbara*	Outside
SR-00382	Spanne, Laurence W.	1980	*An Archaeological Evaluation for the Proposed Quail Meadows Estates, Santa Maria Way Mobile Home Park, County of Santa Barbara*	Outside
SR-02620	Gibson, Robert O.	2000	*Results of Phase I Archaeological Surface Survey and Archival Research Search for the Orcutt Plaza Project, Orcutt, Santa Barbara, California*	Outside
SR-02669	Duke, Curt	2001	*Cultural Resource Assessment for Cingular Wireless Facility No. VY 038-03 Santa Barbara County, California*	Outside

Report Number	Author	Year	Study	Relationship to Study Area
SR-03309	Dice, Michael H.	2003	*Records Search and Site Visit Results for Sprint Telecommunications Facility SN45XC107A (St. Joseph High School), 4120 S. Bradley Road, Santa Maria, Santa Barbara County, California*	Outside
SR-04451	Kiaha, Krista	2007	*Archaeological Survey Report, Union Valley Parkway Project, 05-SB-101-PM 83.1/83.9, EA 05-463800*	**Within**
SR-04603	Nettles, Wendy M.	2008	*Historic Property Survey Report: Union Valley Parkway 05-SB-101-PM 83.1/83.9, EA 05-463800*	**Within**
SR-04603A	Kiaha, Krista	2007	*Archaeological Survey Report: Union Valley Parkway Project 05-SB-101-PM 83.1/83.9, EA 05-463800*	**Within**
SR-04603B	Gerber, Joyce L.	2000	Report Unavailable	**Within**
SR-04603C	Gerber, Joyce L.	2001	Report Unavailable	**Within**
SR-04603D	Gerber, Joyce L. and Leeann Haslouer	2006	*Archaeological Survey Report for the Union Valley Parkway Extension in Santa Maria, Santa Barbara County, California*	**Within**
SR-04603E	Taniguchi, Christeen, Ben Taniguchi, David Livingstone, Peggy Beedle, Sandra S. Flint, and Randy Baloian	2007	*Historical Resources Evaluation Report for the Union Valley Parkway Extension Project in Santa Maria, Santa Barbara County, California, 05-463800 05-SB-101, PM 83.1/83.9*	**Within**
SR-04605	Peterson, Jr., Robert R.	2008	*Supplemental Historical Property Survey Report, Union Valley Parkway/ US 101*	**Within**
SR-04759	Perez, Don C.	2011	*Cultural Resources Analysis: St. Joseph High School/ SF91580A. 4120 South Bradley Road, Santa Maria, Santa Barbara County, California 93455. EBI Project No. 61111999*	Outside
SR-05045	Nawi, Carol	2013	*CLU 4382/ 3553606438 St. Joseph High School, 4120 South Bradley Road, Santa Maria (Santa Barbara County) California*	Outside

SR-00319

Laurence W. Spanne prepared SR-00319, "An Archaeological Evaluation for the 'Orcutt 13' Residential Developments, County of Santa Barbara," in 1979. The cultural resources study included a records search, pedestrian survey, and literature review. Spanne states that historic refuse, which included minimal fragments of Pismo clam shell, was identified within some of his study locations; however, the report does not specify at which parcels the refuse and associated shell were found. No significant unrecorded or previously recorded cultural resources were identified.

SR-04451

Krista Kiaha prepared SR-04451, "Archaeological Survey Report, Union Valley Parkway Project, 05-SB-101-PM 83.1/83.9, EA 05-463800," in 2007. The cultural resources study included a pedestrian field survey and records search. The study efforts did not identify any cultural resources.

SR-04603

Wendy M. Nettles prepared SR-04603, "Historic Property Survey Report: Union Valley Parkway 05-SB-101-PM 83.1/83.9, EA 05-463800," in 2008. The cultural resources study included a records search; field survey; and Native American, local government, and historic group consultation. No archaeological resources were identified. Six historic-period built environment resources were identified and were determined by the California Department of Transportation as ineligible for listing in the NRHP. These historic-period resources are located approximately one mile to the west of the study area.

SR-04603A

Krista Kiaha prepared SR-04603A, "Archaeological Survey Report: Union Valley Parkway Project 05-SB-101-PM 83.1/83.9, EA 05-463800," in 2007. The cultural resources study included an archaeological pedestrian survey and records search. No cultural resources were identified during the records search or field survey.

SR-04603D

Joyce L. Gerber and Leeann Haslouer prepared SR-04603D, "Archaeological Survey Report for the Union Valley Parkway Extension in Santa Maria, Santa Barbara County, California," in 2006. The cultural resources study included a literature review, a records search, Native American outreach, and a field survey. No cultural resources were identified during the study.

SR-04603E

Christeen Taniguchi, Ben Taniguchi, David Livingstone, Peggy Beedle, Sandra S. Flint, and Randy Baloian prepared SR-04603E, "Historical Resources Evaluation Report for the Union Valley Parkway Extension Project in Santa Maria, Santa Barbara County, California, 05-463800 05-SB-101, PM 83.1/83.9," in 2007. The study included a records search, built environment contextual research, and an architectural field survey. Six historic-period properties were identified and evaluated. All properties were determined ineligible for listing in the NRHP.

SR-04605

Robert R. Peterson Jr. prepared SR-04605, "Supplemental Historical Property Survey Report, Union Valley Parkway/US 101," in 2008. The study included a cultural resources records search and Native American consultation. No cultural resources were identified during this study.

Review of Historical Topographic Maps and Aerial Imagery

Rincon reviewed available historical topographic maps and aerial imagery of the study area to determine past land use. Historical topographic maps from 1905 show the study area as undeveloped land with U.S. Highway 101 visible in 1947 (USGS 2019a, 2019b). The expansion of U.S. Highway 101 to four lanes can be seen by 1959 (USGS 2019c). Residential development appears to the west and southwest of the study area in topographic maps dating to 1982 (USGS 2019d).

Plot division and land clearing for agricultural activities within the study area is seen in imagery as early as 1938 (University of California, Santa Barbara 1938). Aerial imagery from 1956 shows U.S Highway 101 in its current alignment with the remainder of the study area as undeveloped land (University of California, Santa Barbara 1956). Imagery from 1967 shows interchange improvements just north of the study area and residential development to the west and southwest of the study area. Additionally, 1967 imagery shows one historic-period building, the extant pet grooming facility, to the north of the study area. By 1981, development just north of the study area is contiguous (Nationwide Environmental Title Research 2019).

Native American Consultation

The County contacted the Native American Heritage Commission and requested a search of the Sacred Lands File (SLF). The Native American Heritage Commission emailed a response on August 29, 2019 stating that the SLF search was returned with "negative" results. The email also included a list of Native American contacts that may have information regarding the study area.

As required by California Government Code Sections 65352.3 and 65352.4 (Senate Bill 18), the County prepared and mailed consultation letters on September 9, 2019 to each contact requesting any information they may have regarding the presence of cultural resources on or near the study area. The County did not receive a reply from any of the contacts.

As required by Public Resources Code (CEQA) Section 21080.3.1 (Assembly Bill 52), the County also mailed a consultation letter on August 14, 2019 to the Chair of the Barbareño/Ventureño Band of Mission Indians. In part, the County offered to consult with the chair or other tribal representatives regarding the proposed project. The County did not receive a reply to its letter.

Pedestrian Survey

Rincon conducted a pedestrian survey of the study area on December 13, 2019. Transect intervals were spaced approximately 15 meters apart and exposed ground surfaces were examined for artifacts (e.g., flaked stone tools, tool-making debris, stone milling tools, ceramics, fire-affected rock), ecofacts (e.g., marine shell and bone), soil discoloration that might indicate the presence of a cultural midden, soil depressions, and features indicative of the former presence of structures or buildings (e.g., standing exterior walls, postholes, foundations) or historic debris (e.g., metal, glass, ceramics). Ground disturbances such as burrows and drainages were also visually inspected. Survey accuracy was maintained using a handheld Global Positioning System (GPS) unit and a georeferenced map of the study area. Site characteristics and survey conditions of the study area were documented using field records and a digital camera. Copies of the survey notes and digital photographs are maintained at the Rincon San Luis Obispo office.

Overall ground visibility was approximately 20 percent with 100 percent exposure (Figure 4 in Attachment A). The soil consisted of a light to medium brown, fine-grained silt populated by seasonal grasses. Dirt and paved roads were seen throughout the study area and trend primarily east-west, with U.S. Highway 101 and Morningside Drive trending northwest-southeast (Figure 5 and Figure 6 in Attachment A). A small section within the central-eastern portion of the study area was recently disturbed from agricultural activity (Figure 7 in Attachment A). Agriculture, specifically blackberry production, was observed along the study area's eastern boundary. The majority of the study area remains largely undeveloped; however, past ground-disturbing activities include underground utility installation, irrigation infrastructure installation, construction of a retention basin, and establishment and maintenance of U.S. Highway 101, Rodeo Drive, Morningside Drive, and unnamed paved and dirt roads (Figure 8 and Figure 9 in Attachment A).

Within the study area, Rincon located one unmodified Pismo clam shell fragment on the northwest corner of APN 107-240-005, approximately 400 feet southeast of the intersection of Rodeo Drive and Founders Avenue (Figure 10 in Attachment A). No other prehistoric or historic-period resources were observed within the study area during the pedestrian survey.

To the north of the study area, Rincon located two concrete foundations approximately 130 feet and 440 feet away from the study area (Figure 11 in Attachment A). Based on the aerial imagery maintained by the County Planning and Development Department, the two concrete foundations appear to have supported agricultural or other accessory structures associated with a former dwelling that was located approximately 300 feet east of the existing pet grooming business. Rincon did not document any remains of the dwelling during the pedestrian survey. The dwelling and accessory structures were constructed between September 1981 and June 1989. The dwelling and northernmost accessory structure were demolished or otherwise removed by 2000. The southernmost accessory structure was demolished or otherwise removed between 2006 and 2008. In addition, one historic-period building, seen in aerials from 1967, is located approximately 350 feet to the north of the study area on the property that includes the pet grooming business (Figure 12 and Figure 13 in Attachment A).

Findings and Recommendations

The cultural resources records search performed for the project identified no previously recorded prehistoric or historic-period resources within the study area or the 0.25-mile radius surrounding the study area. The SLF returned negative results and the County performed consultation with Native American tribes known to be culturally and traditionally affiliated with the study area. Review of historical aerial imagery indicates a high level of ground disturbance within the study area resulting from underground utility installation, irrigation infrastructure, a retention basin, and establishment and maintenance of named and unnamed paved and dirt roads.

Within the study area, one unmodified Pismo clam shell fragment was located during the pedestrian survey. Given the distance to the Pacific Ocean (more than 10 miles) and scarcity of the find, it is likely that the single Pismo clam shell fragment does not represent archaeological remains reflecting prehistoric use of the study area.

To the north of the study area, ranging from approximately 130 feet to 440 feet from the study area, two concrete foundations and one historic-period building were located during the pedestrian survey.

The two concrete foundations were constructed relatively recently (less than 50 years old) and were used for a short period (between approximately 11 to 27 years). Therefore, they do not appear to meet the criteria for listing in the California Register of Historic Resources or otherwise qualify as a historical resource per CEQA Guidelines section 15064.5.

The historic-period building is now utilized as a pet grooming facility. The facility contains two permanent buildings, although only one is identified in historical aerials. The historic-period building located within the chain-link fenced facility is a vernacular style L-shaped building with composite shingling and stucco walls. The building is likely a former residence with an addition joined to the main building. Dog kennels comprised of chain-link fence and corrugated metal roofs are visible along the eastern and northern perimeter of the fenced facility. The concrete foundations and historic-period building are located outside the study area, and the project would not alter the foundations or the building. Therefore, the project would result in no direct or indirect impacts to historical resources.

The results of the cultural resources records search, archival research, and intensive pedestrian field survey concluded that no significant cultural resources exist within the study area. Based on the results of the cultural resource assessment, Rincon recommends a finding of ***"no impact" to historical resources*** under CEQA.

Although no archaeological resources were identified on or near the study area as a result of this study, unanticipated discoveries during construction are a possibility. Accordingly, Rincon recommends implementation of the County's following Standard Condition of Approval for stopping construction work immediately upon encountering cultural resources to minimize potential impacts to such resources:

CulRes-09: Stop Work at Encounter

The Project Proponent and/or their agents, representatives, or contractors shall stop or redirect work immediately in the event archaeological remains are encountered during grading, construction, landscaping, or other construction-related activity. The Project Proponent shall retain a County Planning and Development-qualified archaeologist and Native American representative to evaluate the significance of the find in compliance with the provisions of Phase 2 investigations of the County Archaeological Guidelines (County of Santa Barbara 2018) and funded by the Project Proponent.
PLAN REQUIREMENTS: This condition shall be printed on all building and grading plans.
MONITORING: Planning and Development permit processing planner shall check plans prior to permit issuance, and Planning and Development compliance monitoring staff shall spot check in the field throughout grading and construction.

With adherence to this Standard Condition of Approval, Rincon recommends a finding of ***"less than significant impact" to historical and unique archaeological resources***. The project is also required to adhere to regulations regarding the unanticipated discovery of human remains, which are discussed below.

Human Remains

The discovery of human remains is always a possibility during ground-disturbing activities. If human remains are found, the State of California Health and Safety Code Section 7050.5 states that no further disturbance shall occur until the county coroner has determined origin and disposition pursuant to

Public Resources Code Section 5097.98. In the event of an unanticipated discovery of human remains, the county coroner must be notified immediately. If the human remains are determined to be prehistoric, the coroner will notify the Native American Heritage Commission, which will determine and notify a most likely descendant, who has 48 hours from being granted site access to make recommendations for the disposition of the remains. If the most likely descendant does not make recommendations within 48 hours, the land owner shall reinter the remains in an area of the property secure from subsequent disturbance.

Closing

Thank you for the opportunity to continue to work with you on this important project. Please contact us if you have questions concerning the contents of this letter report.

Sincerely,
Rincon Consultants, Inc.

Hannah Haas, MA, RPA
Archaeologist and Project Manager

Christopher A. Duran, MA, RPA
Principal and Senior Archaeologist

Mary Pfeiffer, BA
Associate Archaeologist

Attachments

Attachment A Figures
Attachment B Records Search Results

References

California Soil Resource Lab. 2019. SoilWeb, 34.881196, -120.409373 [interactive map]. https://casoilresource.lawr.ucdavis.edu/ (accessed December 2019).

Nationwide Environmental Title Research. 2019. “Orcutt, California” Historic Aerials [photographic database]. https://www.historicaerials.com/viewer (accessed December 2019).

National Park Service. 1983. Archaeological and Historic Preservation: Secretary of the Interior’s Standards and Guidelines [electronic document]. https://www.nps.gov/history/local-law/arch_stnds_0.htm (accessed December 2019).

Santa Barbara, County of. 2016. A Planner’s Guide to Conditions of Approval and Mitigation Measures. Planning and Development. First published December 2002; last revised March 2016.

_____. 2018. Environmental Thresholds and Guidelines Manual. March 2018.

University of California, Santa Barbara. 1938. Aerial Image, Flight ID: C-4950, Frame: SA-91 [electronic document]. http://mil.library.ucsb.edu/ap_indexes/FrameFinder/ (accessed December 2019).

_____. 1956. Aerial Image, Flight ID: HA-AN [electronic document]. http://mil.library.ucsb.edu/ap_indexes/FrameFinder/ (accessed December 2019).

United States Geological Survey (USGS). 2019a. 1905, Lompoc, 1:125000 topographic map [electronic document]. https://ngmdb.usgs.gov/ht-bin/tv_browse.pl?id=15532c9565ef1d4f253badc0728ff2af (accessed December 2019).

_____. 2019b. 1947, Santa Maria, 1:62500 topographic map [electronic document]. https://ngmdb.usgs.gov/ht-bin/tv_browse.pl?id=a9b7fb7c3229b3532149021049a12497 (accessed December 2019).

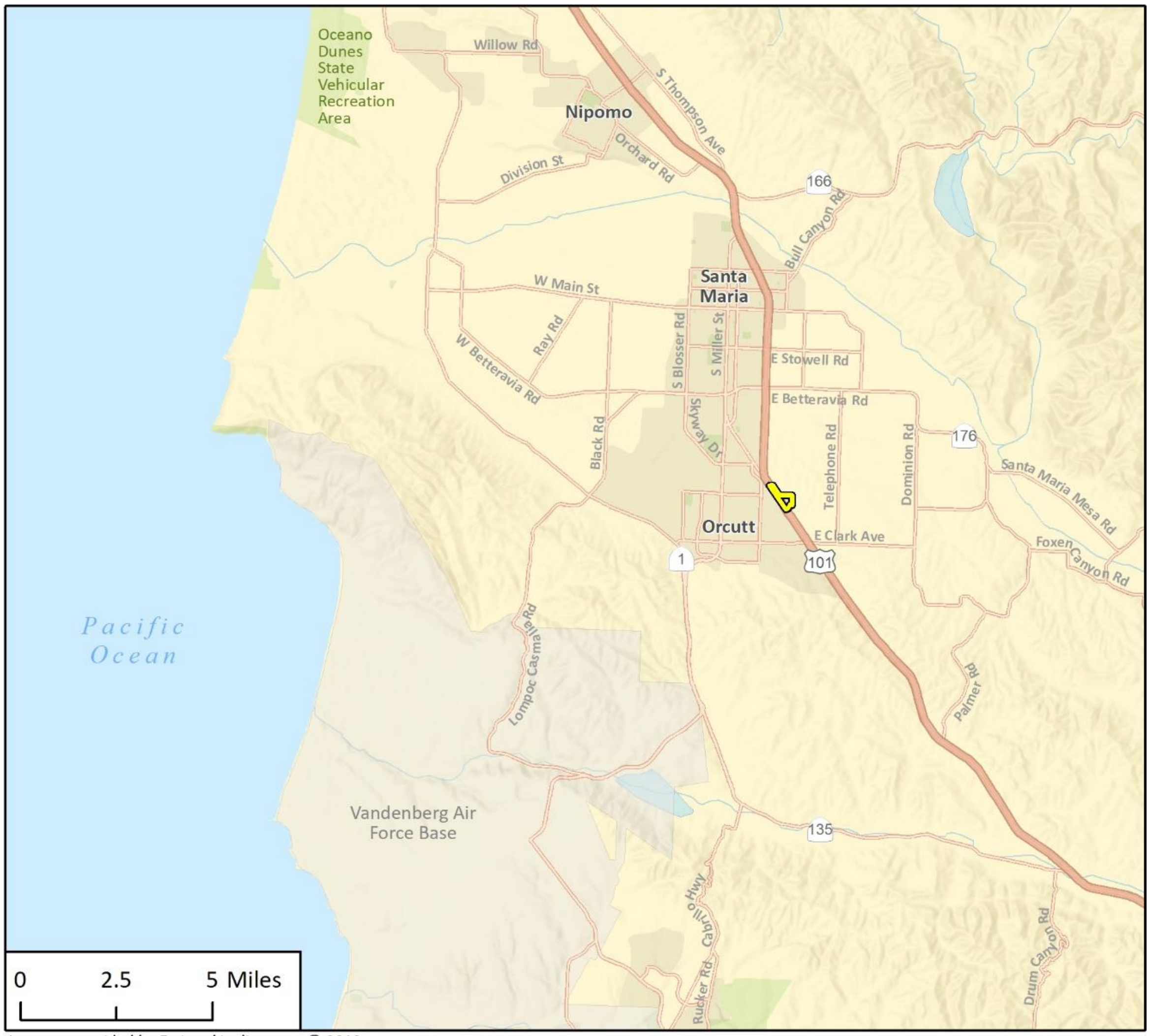
_____. 2019c. 1959, Santa Maria, 1:24000 topographic map [electronic document]. https://ngmdb.usgs.gov/ht-bin/tv_browse.pl?id=3ee005305a8aa97b14cacc3c9ce5d103 (accessed December 2019).

_____. 2019d. 1982, Santa Maria, 1:100000 topographic map [electronic document]. https://ngmdb.usgs.gov/ht-bin/tv_browse.pl?id=63e5010d89c23d18daecb70ec6634978 (accessed December 2019).

Attachment A

Figures

Figure 1 Regional Location Map



Imagery provided by Esri and its licensors © 2019.

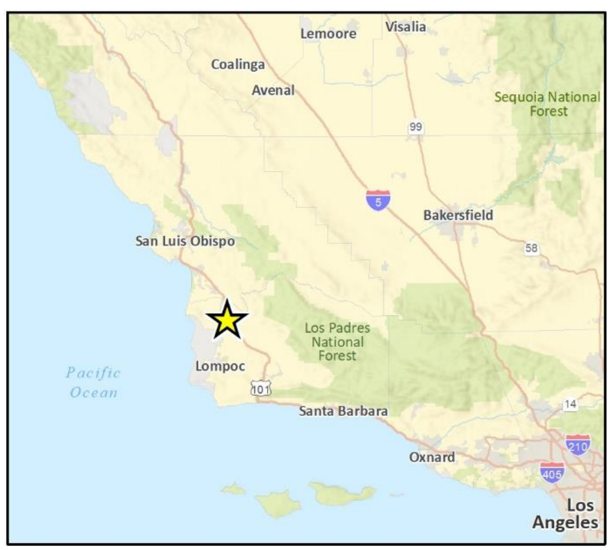
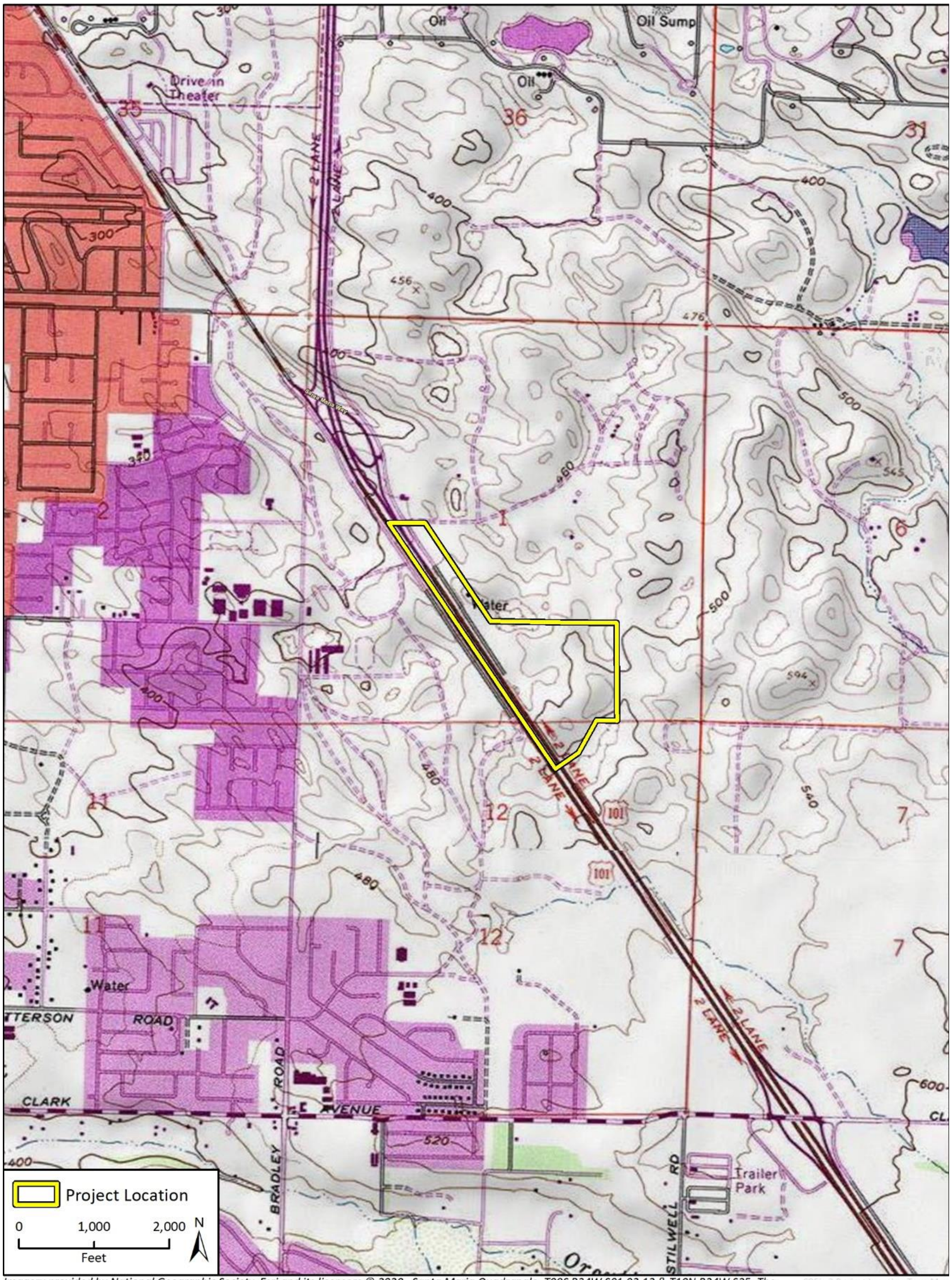
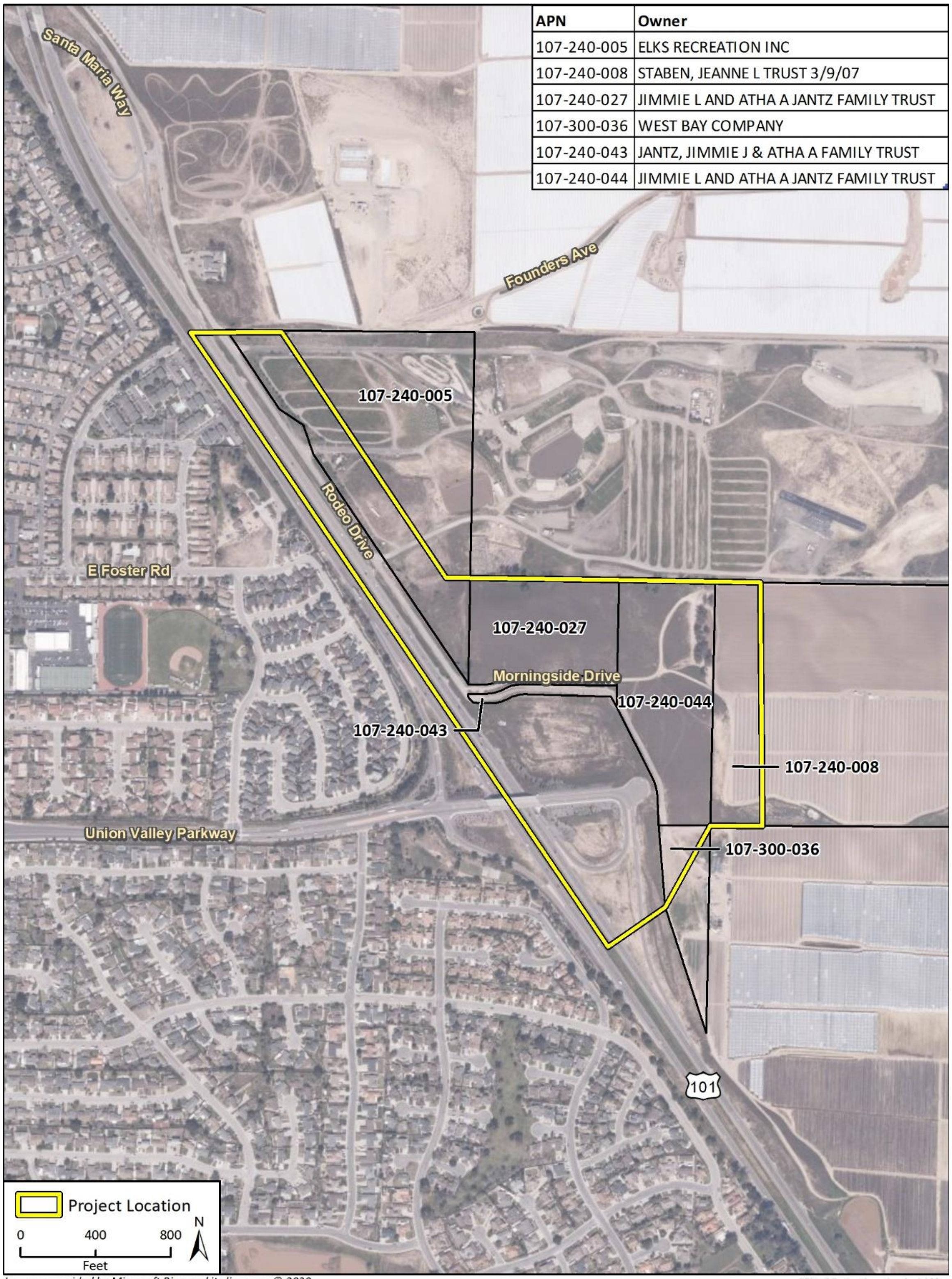


Figure 2 Topographic Study Area Location Map



Imagery provided by National Geographic Society, Esri and its licensors © 2020. Santa Maria Quadrangle. T09S R34W S01,02,12 & T10N R34W S35. The topographic representation depicted in this map may not portray all of the features currently found in the vicinity today and/or features depicted in this map may have changed since the original topographic map was assembled.

Figure 3 Aerial Study Area Location Map



Imagery provided by Microsoft Bing and its licensors © 2020.

Figure 4 Ground Visibility within Study Area, Facing Northeast

Figure 5 Rodeo Drive within Study Area, Facing Northeast

Figure 6 Unpaved Roadway within Study Area, Facing East

Figure 7 Agricultural Activity within Study Area, Facing East

Figure 8 Evidence of Underground Utilities within Study Area, Facing Northeast

Figure 9 Fenced Retention Basin within Study Area, Facing East

Figure 10 Pismo Clam Shell Fragment Discovered within Study Area

Figure 11 Concrete Foundation of Unknown Age within Study Area, Facing Northeast

Figure 12 Historic-Period Building within Study Area, Facing West

Figure 13 Historic-Period Building within Study Area, Facing Southwest

Attachment B

Records Search Results

Report List

Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
SR-00319		1979	Spanne, Larry	An Archaeological Evaluation for the "Orcutt 13" Residential Developments County of Santa Barbara	none given	
SR-00325		1980	Spanne, L.	An Archaeological Evaluation for Tract No. 12,995 Orcutt, California, County of Santa Barbara.		
SR-00382		1980	Spanne, L.	An archaeological evaluation for the proposed Quail Meadows Estates, Santa Maria Way Mobile Home Park, County of Santa Barbara.		
SR-02620		2000	Robert O Gibson	Results of Phase 1 Archaeological Surface SUrvey and Archival Research Search For the Orcutt Plaza Project, Orcutt, Santa Barbara County, CA	Gibson's Archaeological Consulting	
SR-02669		2001	Duke, C.	Cultural Resource Assessment for Cingular Wireless Facility No. VY 038-03 Santa Barbara County, California	LSA Associates, Inc.	
SR-03309		2003	Dice, M.	Records Search and Site Visit Results for Sprint Telecommunications Facility SN45XC107A (St. Joseph High School), 4120 S. Bradley Road, Santa Maria, Santa Barbara County, California		
SR-04451		2007	Kiaha, Krista	Archaeological Survey Report, Union Valley Parkway Project, 05-SB-101-PM 83.1/83.9, EA 05-463800	Caltrans District 5	
SR-04603		2008	Wendy M. Nettles	Historic Property Survey Report, Union Valley Parkway	Applied EarthWorks, Inc.	
SR-04603A		2007	Krista Kiaha	Archaeological Survey Report: Union Valley Parkway Project 05-SB-101-PM 83.1/83.9, EA 05-463800	Caltrans District 5	
SR-04603B		2000	Gerber	Not attached to report, only listed as an attachment within it.		
SR-04603C		2001	Gerber	Not attached to report, only listed as attached within it.		
SR-04603D		2006	Joyce L. Gerber and Leeann Haslouer	Archaeological Survey Report for the Union Valley Parkway Extension in Santa Maria, Santa Barbara County, California	Applied EarthWorks, Inc.	

Report List

Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
SR-04603E		2007	Christeen Taniguchi, Ben Taniguchi, David Livingstone, Peggy Beedle, Sandra S. Flint, and Randy Baloian	Historical Resources Evaluation Report for the Union Valley Parkway Extension Project in Santa Maria, Santa Barbara County, California	Galvin Preservation Associates Inc.	
SR-04605		2008	Robert R. Peterson, Jr.	Supplemental Historical Property Survey Report, Union Valley Pkwy/US101	Applied EarthWorks, Inc.	
SR-04759		2011	Perez, Don C.	Cultural Resources Analysis: St. Joseph's HS / SF91580A. 4120 South Bradley Road, Santa Maria, Santa Barbara County, California 93455. EBI Project No. 61111999.	EBI Consulting	
SR-05045		2013	Nawi, Carol	CLU4382/3553606438 St. Joseph High School, 4120 South Bradley Road Santa Maria (Santa Barbara County) CA		

Attachment 6

Energy Calculation Sheets

Orcutt Community Plan Amendment - Proposed Project

Last Updated: January 2, 2020

Compression-Ignition Engine Brake-Specific Fuel Consumption (BSFC) Factors **[1]**:

HP: 0 to 100	0.0588	HP: Greater than 100	0.0529

Values above are expressed in gallons per horsepower-hour/BSFC.

CONSTRUCTION EQUIPMENT

Construction Equipment	#	Hours per Day	Horsepower	Load Factor	Construction Phase	Fuel Used (gallons)
Excavators	3	8	158	0.38	Demolition	1,523.35
Concrete/Industrial Saws	1	8	81	0.73	Demolition	555.96
Rubber Tired Dozers	2	8	247	0.40	Demolition	1,671.19
Rubber Tired Dozers	3	8	247	0.40	Site Preparation	1,253.39
Tractors/Loaders/Backhoes	4	8	97	0.37	Site Preparation	674.90
Rubber Tired Dozers	2	8	247	0.40	Grading	8,523.07
Graders	2	8	187	0.41	Grading	6,614.00
Tractors/Loaders/Backhoes	3	8	97	0.37	Grading	5,162.95
Excavators	2	8	158	0.38	Grading	5,179.40
Air Compressors	1	6	78	0.48	Architectural Coating	264.02
Pavers	2	8	130	0.42	Paving	2,031.82
Paving Equipment	2	8	132	0.36	Paving	1,768.35
Rollers	2	8	80	0.38	Paving	1,257.65
					Total Fuel Used	**36,480.04 (Gallons)**

Construction Phase	Days of Operation
Demolition Phase	20
Site Preparation Phase	10
Grading Phase	102
Paving Phase	44
Architectural Coating Phase	20
Total Days	196

WORKER TRIPS

Constuction Phase	MPG [2]	Trips	Trip Length (miles)	Fuel Used (gallons)
Demolition	24.0	15	8.3	103.75
Site Preparation	24.0	18	8.3	62.25
Grading	24.0	15	8.3	529.13
Paving	24.0	15	8.3	228.25
Architectural Coating	24.0	24	8.3	166.00
			Total	**1,089.38**

HAULING AND VENDOR TRIPS

Trip Class	MPG [2]	Trips	Trip Length (miles)	Fuel Used (gallons)
Demolition	7.4	182	20.0	491.89
Site Preparation	7.4	448	8.3	502.49
Grading	7.4	5250	20.0	14189.19
			Total	**15,183.57**

Total Gasoline Consumption (gallons)	**1,089.38**
Total Diesel Consumption (gallons)	**51,663.61**

Sources:

[1] United States Environmental Protection Agency. 2018. *Exhaust and Crankcase Emission Factors for Nonroad Compression-Ignition Engines in MOVES2014b* . July 2018. Available at: https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100UXEN.pdf.

[2] United States Department of Transportation, Bureau of Transportation Statistics. 2018. *National Transportation Statistics 2018* . Available at: https://www.bts.gov/sites/bts.dot.gov/files/docs/browse-statistical-products-and-data/national-transportation-statistics/223001/ntsentire2018q4.pdf.

Attachment 7

Traffic Impact Study

Traffic Impact Study
Orcutt Community Plan Amendment Project

PREPARED FOR

COUNTY OF SANTA BARBARA
CALIFORNIA

May 2020

Balancing the Natural and Built Environment

PSOMAS

TRAFFIC IMPACT STUDY
FOR ORCUTT COMMUNITY PLAN AMENDMENT PROJECT
SANTA BARBARA COUNTY, CA

PREPARED FOR

PREPARED BY

PSOMAS

CASE NO. 18GPA-00000-00001

PSOMAS PROJECT NO. 6RIN010100

MAY 2020

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1. INTRODUCTION

1.1. PROJECT DESCRIPTION

The County of Santa Barbara (County) is proposing an amendment to the *Orcutt Community Plan* (*OCP*) (i.e., processing a General Plan Amendment [GPA])[1] to include a new local road connection between the Union Valley Parkway (UVP)/U.S. Highway 101 (US-101) interchange and the adjoining frontage road (commonly referred to as "Rodeo Drive") on the east side of US-101 (herein referred to as "proposed project" or "project").

The proposed project is in its initial phase, as approval of the GPA for the project would not result in any physical development or construction activities. The actual building of the proposed future roadway will require additional review and approval through the California Department of Transportation (Caltrans) Project Development Process. However, this Traffic Impact Study (TIS) discusses projected traffic volumes and analyzes potential impacts related to transportation/traffic of future phases of the project, including for the projected opening year (2025) and long term (2040) scenarios.

The future local road connection near the existing highway interchange would likely be constructed primarily at grade level and of similar materials (asphalt) as the existing roadway to which the future road would connect. The proposed project would allow all motorists to use the future road connection to access northbound and southbound US-101 either from Santa Maria Way (as allowed under current conditions) or from UVP. As part of the proposed project, Rodeo Drive would also be improved to meet County standards for a Collector Road.

The community of Orcutt is in unincorporated Santa Barbara County, immediately south of the city of Santa Maria. The transportation/traffic study area for the project (TIS study area) is located in Key Site 33 of the *OCP* Area and includes US-101 as well as land to the east of US-101. The TIS study area consists of agricultural land currently used for berry production, a portion of the western part of the Santa Maria Elks Unocal Event Center, fallow agricultural land, and a Caltrans-owned detention basin for stormwater runoff (just north of UVP east of US-101). The developed portions of the study area have been altered and cleared to the extent that native vegetation is no longer supported.

The study area north and east of the UVP/US-101 interchange currently serves a mix of uses, including agriculture, a pet grooming business, and the Santa Maria Elks Unocal Event Center (Elks Unocal Event Center). In addition, the Santa Maria Joint Union High School District (SMJUHSD) is constructing the Agricultural Education and Career Technical Center.

Caltrans requires jurisdictions to evaluate reasonable alternatives when analyzing transportation projects, including potential modifications to existing facilities. The closest existing interchange to UVP/US-101 is the Santa Maria Way/US-101 interchange, which is located approximately one mile north of the UVP/US-101 interchange. In a letter dated January 10, 2020, Caltrans requires the County to analyze the Santa Maria Way/US-101 interchange (Appendix A). Therefore, this TIS also evaluates conceptual modifications to the Santa Maria Way/US-101 interchange (Santa Maria Way Interchange Modification). The modification would include the extension of Santa Maria Way to the east, including realignment of Rodeo Drive and of the US-101 northbound off-ramp. Although the modification would not provide any new roadways and would not result in a change in traffic patterns, the redesigned interchange would provide improved intersection spacing and more typical intersection geometry.

The Santa Maria Way Interchange Modification is not part of the GPA or the associated Initial Study-Mitigated Negative Declaration (IS-MND). Rather, this TIS includes the modification for informational purposes. Figure 1 shows the general location of the proposed project and the Santa Maria Way Interchange Modification. Figure 2 shows a schematic of the proposed project and Santa Maria Way Interchange Modification. The schematics in Figure 2 are illustrative and may not meet the design criteria and policies contained in the Santa Barbara County Engineering Design Standards.[2]

The following sections further describe the TIS study area and associated methodology used in this TIS. Note that the TIS study area is larger than the project study area used in the IS-MND for the project because the IS-MND only considers the proposed road connection between the UVP/US-101 interchange and the Rodeo Drive (proposed project). It is noted that the Santa Maria Way Interchange Modification is not discussed in the project-specific IS-MND.

Figure 1. Site Location

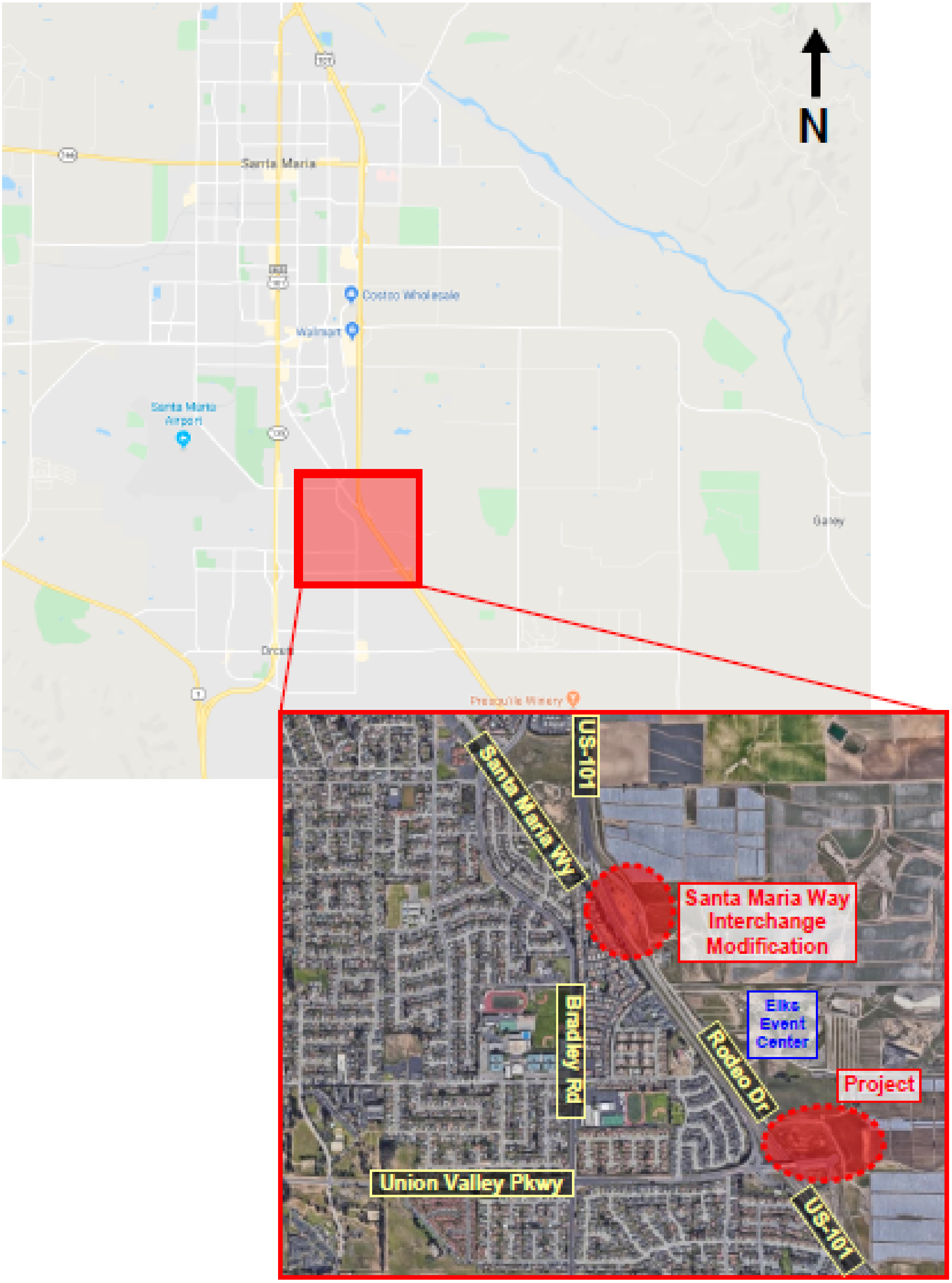
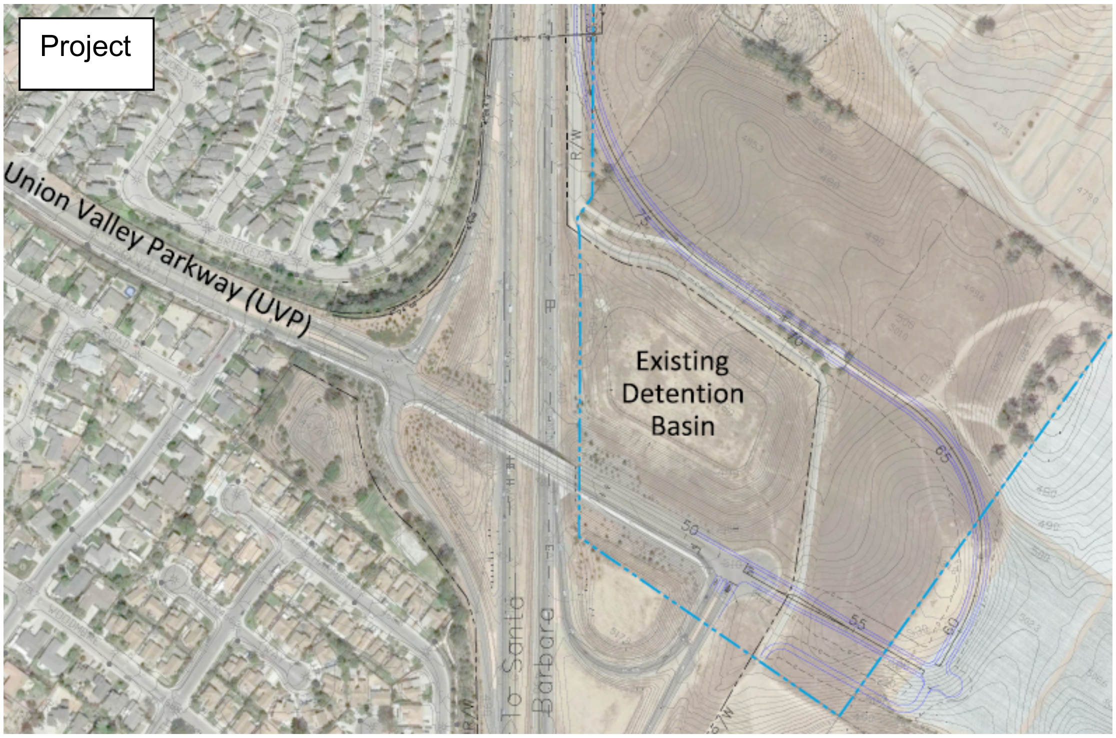
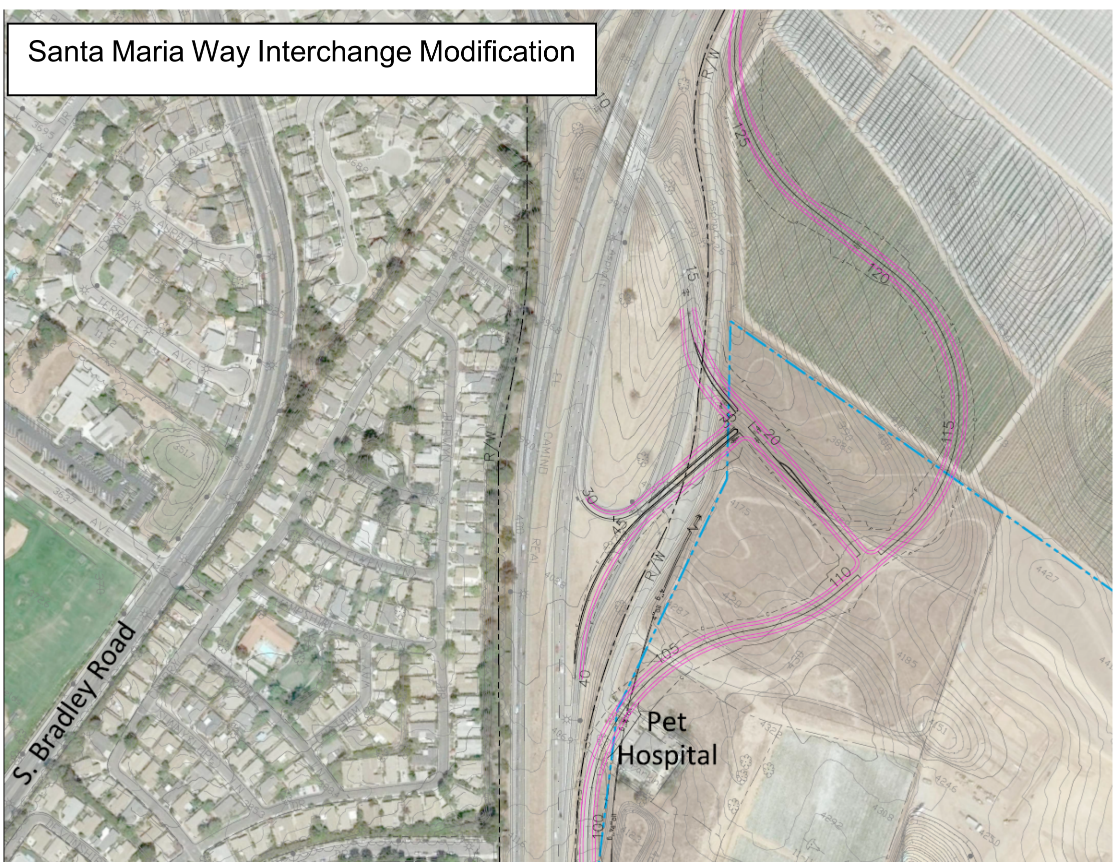


Figure 2. Proposed Alignments: Project and Santa Maria Way Interchange Modification





1.2. PURPOSE AND NEED

1.2.1. Purpose

The purpose of the proposed GPA is to amend the *OCP* to show a second point of access to the existing development east of US-101 via a new local road connection to the UVP/US-101 interchange. The GPA will also classify Rodeo Drive as a Secondary 1 (Class S-1) roadway in the *OCP* Circulation Element (County of Santa Barbara, June 2019).

The proposed local road connection would improve access, relieve congestion, and reduce emergency response times during events at the Elks Unocal Event Center. It would also better serve the planned development in Key Site 33, east of US-101. The *OCP* Area contains 43 “Key Sites,” areas within Orcutt which are generally vacant and/or under-developed and have similar characteristics such as zoning, access, and/or development potential. The County previously identified the areas suitable for development within each Key Site, as well as constrained areas within each Key Site. The *OCP* anticipates some growth in Key Site 33 including the Elks Unocal Event Center (currently existing), three motels with up to 80 rooms each, two drive-thru fast food restaurants, and a convenience market/gas station.

Additionally, the proposed local road connection would help reduce overall vehicle miles traveled (VMT) for the TIS study area by allowing drivers traveling to the Elks Unocal Event Center or existing development east of US-101 from the south and west to use UVP instead of traveling past the UVP/US-101 interchange to the Santa Maria Way/US-101 interchange and backtracking along Rodeo Drive.

1.2.2. Need

Currently, Santa Maria Way and the associated Santa Maria Way/US-101 interchange provide the single point of public access to the area east of US-101 between the Santa Maria Way and UVP interchanges. The existing Santa Maria Way/US-101 interchange has a non-standard configuration with the Rodeo Drive at-grade stop-controlled intersection occurring within the ramp areas where speeds have been observed to be high due to the existing geometry. A preliminary review of the existing interchange geometrics indicates there are several non-standard elements including:

- The left shoulder width of <2ft for the NB US-101 Off-Ramp is less than the 4 ft minimum
- The corner sight distance at the Rodeo Drive intersection is estimated to be 400 ft which is below the Caltrans standard for the observed vehicle speeds
- Lane width for the loop on-ramp is approximately 17 ft which is below the required 20 ft standard.

Santa Maria Way and the Santa Maria Way/US-101 interchange experience high traffic volumes and congestion during rodeos, concerts, and other events at the Elks Unocal Event Center. As a result, the Elks Unocal Event Center currently contract with the California Highway Patrol (CHP) to direct traffic during large events.

The proposed project would provide an alternative access to the Elks Unocal Event Center, thereby helping to relieve traffic congestion and improve safety and emergency vehicle access along Santa Maria Way. The proposed project would also generally improve intersection operations throughout the project area when compared to the no build scenario, particularly at the Santa Maria Way/US-101 interchange. The lone exception is at the Elks Unocal Event Center Access and Rodeo Drive intersection during a large event. Operations along the US-101 mainline and the ramps would also generally be improved with the proposed project.

Although the Santa Maria Way Interchange Modification is evaluated in this TIS per Caltrans guidelines, it should be noted that it does not fully address the need for this project. The need for the project is based on improved access and circulation for major events, as well as emergency vehicles. The modifications to the Santa Maria Way Interchange lack a redundant point of access to the Elks Unocal Event Center, which would negatively impact traffic operations, circulation, and emergency response times. Further, improvements to the Santa Maria Way Interchange would need to be constructed while maintaining existing traffic due to lack of alternative routes, which would create potential hazards for users and construction workers.

1.3. STUDY AREA

The TIS study area includes eight existing intersections, as listed below:

1. Santa Maria Way/College Drive/Bradley Road (signalized)
2. Santa Maria Way/US-101 southbound (SB) Ramps (unsignalized)
3. Santa Maria Way/Rodeo Drive/US-101 northbound (NB) Ramps (unsignalized)
4. Rodeo Drive/US-101 NB Ramps (unsignalized)
5. Elks Unocal Event Center access/Rodeo Drive (unsignalized)
6. UVP/US-101 NB Ramps (unsignalized)
7. UVP/US-101 SB Ramps (unsignalized)
8. UVP/Bradley Road (signalized)

In addition to the eight intersections, the TIS study area includes the following five roadway segments:

A. US-101, north of Santa Maria Way
B. US-101, from Santa Maria Way to UVP
C. US-101, south of UVP
D. Rodeo Drive, near Elks Unocal Event Center access
E. UVP, from US-101 SB Ramps to Bradley Road

Rodeo Drive was included because the project has the potential to divert substantial traffic volumes to this frontage road. Caltrans requested that the other four segments be included as well. Figure 3 shows the study intersections and roadway segments.

Figure 3. Study Intersections and Segments

Lastly, Caltrans also requested analysis of the on- and off-ramps in the study area, including:

- US-101 SB Off-Ramp at Santa Maria Way
- US-101 SB On-Ramp at Santa Maria Way
- US-101 NB Off-Ramp at Santa Maria Way
- US-101 NB On-Ramp at Santa Maria Way
- US-101 SB Off-Ramp at UVP
- US-101 SB On-Ramp at UVP
- US-101 NB Off-Ramp at UVP
- US-101 NB On-Ramp at UVP

1.4. ANALYSIS METHODOLOGY

Level of Service (LOS) is the standard used to measure the quality of traffic operations at an intersection or on a roadway. LOS A represents relatively free operating conditions, whereas LOS F has unstable flow and congestion with volumes at or near the capacity of the facility. Excessive delays and queues can occur when the LOS is not acceptable. The redistribution of traffic resulting from the project or in combination with other projects in the area could worsen the LOS of a facility. The *OCP* Circulation Element (Subsection A, Definitions, Acceptable Capacity) states that "The acceptable level of service for roadways and intersections in the Orcutt Planning Area is Level of Service C."

To assess the potential traffic impacts due to the project and due to background traffic growth, the TIS evaluates the following scenarios:

- Analysis Year (2019):
  - Existing Conditions: Weekday
  - Existing Conditions: Weekend with Elks Unocal Event Center Event
  - Existing Conditions with the Project: Weekday
  - Existing Conditions with the Project: Weekend with Elks Unocal Event Center Event
  - Existing Conditions with the Santa Maria Way Interchange Modification: Weekday
  - Existing Conditions with the Santa Maria Way Interchange Modification: Weekend with Elks Unocal Event Center Event
- Opening Year (2025):
  - Cumulative Conditions: Weekday
  - Cumulative Conditions: Weekend with Elks Unocal Event Center Event
  - Cumulative Conditions with the Project: Weekday
  - Cumulative Conditions with the Project: Weekend with Elks Unocal Event Center Event
  - Cumulative Conditions with the Santa Maria Way Interchange Modification: Weekday

  Cumulative Conditions with the Santa Maria Way Interchange Modification: Weekend with Elks Unocal Event Center Event
- Long Term (2040):

- Long Term Conditions: Weekday
- Long Term Conditions: Weekend with Elks Unocal Event Center Event
- Long Term Conditions with the Project: Weekday
- Long Term Conditions with the Project: Weekend with Elks Unocal Event Center Event
- Long Term Conditions with the Santa Maria Way Interchange Modification: Weekday
- Long Term Conditions with the Santa Maria Way Interchange Modification: Weekend with Elks Unocal Event Center Event

The TIS follows the County's *Environmental Thresholds and Guidelines Manual*[3] and the *OCP*.[4] This study evaluated non-freeway ramp intersections based on the Intersection Capacity Utilization (ICU) methodology at signalized intersections. For the unsignalized intersections and the intersections operated under Caltrans' jurisdiction, operational analyses were based on the *Highway Capacity Manual* (*HCM*) methodology. Caltrans roadway segments and ramps were also evaluated based on the *HCM* methodology. Arterial roadway segments were evaluated based on the *OCP*. The methodologies and significance thresholds are discussed further in the following sections.

1.4.1. Signalized Intersections

The ICU methodology was used to determine the operating LOS of the two signalized County intersections in the study area (Santa Maria Way/College Drive/Bradley Road and UVP/Bradley Road). This methodology requires the calculation of the intersection volume-to-capacity (V/C) ratio, which is the summation of critical lane group flow ratios with a yellow clearance adjustment. The LOS estimated by the ICU methodology is directly related to the intersection V/C ratio.

Per the Santa Barbara County Association of Governments (SBCAG) *Congestion Management Program (CMP)*[5], the methodology should use a maximum of 1,600 vehicles per hour per lane. A ten percent yellow clearance cycle (i.e., lost time) should be included in the calculations. Based on the *OCP*, the impact related to the project would be considered significant if the increase in the V/C ratio with the project equals or exceeds the values shown in Table 1.

Table 1. Significant Impact Thresholds – Signalized Intersections

Intersection Estimated Future LOS	Project V/C Increase
A	> 0.20
B	> 0.15
C	> 0.10
D	> 0.03
E	> 0.02
F	> 0.01

1.4.2. Unsignalized Intersections

The *OCP* defines unsignalized intersection consistency based on LOS and delay. This study applied the *HCM* methodology to evaluate the unsignalized County intersections, which defines LOS based on delay. The analyses for the unsignalized intersections were conducted using the software *Synchro*.

Based on the *OCP*, projects contributing peak hour trips to unsignalized intersections that operate at an estimated future LOS A are consistent with the *OCP* unless the project results in a change of LOS to C or worse. Further, projects contributing peak hour trips to intersections that operate better than estimated future LOS C are consistent with the *OCP*.

This TIS assumed that traffic signals would be constructed for ramp intersections that would fail for a given condition; however, it is anticipated that traffic control needs for unsignalized intersections will be assessed using Caltrans' Intersection Control Evaluation (ICE) procedures at a future date, likely during the Project Study Report (PSR) phase.

1.4.3. Caltrans Intersections

The LOS at the intersections operating under Caltrans' jurisdiction is based on measures of effectiveness defined in the *HCM*. Caltrans aims to have facilities operate at the transition between LOS C and LOS D. Although not required by Caltrans, this study includes additional evaluation of any Caltrans intersection that was expected to operate below the *OCP* threshold of LOS D to determine potential improvement options. The analyses for the Caltrans intersections were conducted using the software *Synchro*.

There are no formal Caltrans thresholds to determine significant impacts. Considering that Caltrans wants to maintain facilities operating at LOS D or better, this study assumed that a project-related impact is considered significant if the LOS changes from D or better to E or F. Further, a significant impact occurs if the facility operates at LOS E or F during existing conditions and the project-related traffic results in an increase in delay.

1.4.4. Caltrans Segments and Ramps

The study also evaluates the three segments of US-101 as well as the on- and off-ramps based on *HCM* methodology. Caltrans aims to have facilities operate at the transition between LOS C and LOS D. The analyses for the Caltrans segments and ramps were conducted using the *Highway Capacity Software (HCS)*. For reference, the operations of the mainline are also compared to the *OCP* capacity thresholds; however, the *OCP* does not include capacity thresholds for the ramps, so no comparison is made. Because the mainline is a Caltrans facility, the ultimate need for improvements will be based on the Caltrans-specified methodology (*HCS*).

Recall that there are no formal thresholds from Caltrans to determine significant impacts. Considering that Caltrans wants to maintain facilities operating at LOS D or better, this study assumed that a project-related impact is considered significant if the LOS changes from D or better to E or F. Further, a significant impact occurs if the facility currently operates at LOS E or F and the project-related traffic results in an increase in delay.

1.4.5. Arterial Roadway Segments

The CMP does not require the evaluation of roadway segments on local arterials. However, considering the potential shifts in traffic patterns, this study evaluated Rodeo Drive and UVP using the *OCP Circulation Element* capacity thresholds. Table 2 shows the capacity thresholds for each roadway classification from the *OCP*. The thresholds are in vehicles per day (vpd). In the *OCP*, the acceptable LOS for roadway segments is LOS C. However, for primary roadway segments where the traffic volumes exceed the acceptable capacity, a project is considered consistent with the *OCP* if the intersections affected by traffic assigned from the project operate at or above LOS C.

Table 2. OCP Daily Traffic Volume (vpd) LOS Thresholds

Classification	Design Capacity		LOS C*	
	2 Lane	4 Lane	2 Lane	4 Lane
Primary 1	19,990	47,800	15,900	38,200
Primary 2	17,900	42,500	14,300	34,000
Primary 3	15,700	37,700	12,500	30,100
Secondary 1	11,600	N/A	9,300	N/A
Secondary 2	9,100	N/A	7,300	N/A
Secondary 3	7,900	N/A	6,300	N/A

***Defined as 80% of Design Capacity**

2. EXISTING STUDY AREA CONDITIONS

2.1. ROADWAY NETWORK

There are five existing major roadways in the study area, as discussed below:

Bradley Road is a five-lane (two lanes in each direction and a two-way left-turn lane) roadway through much of the study area, becoming a four-lane divided roadway from Terrace Avenue to Santa Maria Way. The roadway is classified as minor arterial by the Caltrans' *California Road System (CRS)* maps[6] and as Primary 3 (Class P-3) by the *OCP*. Bradley Road has a posted speed limit of 45 mph through the study area.

Santa Maria Way is a four-lane divided road through the study area. The roadway is classified as minor arterial street by Caltrans and as Class P-2 by the *OCP*. Santa Maria Way has a posted speed limit of 50 mph.

US-101 is classified as freeway by Caltrans and primary 1 by the *OCP*, and has a posted speed limit of 65 mph. US-101 is a four-lane divided highway through most of the study area, except for the segment north of Santa Maria Way, which has three lanes in the northbound direction and two lanes in the southbound direction.

Union Valley Parkway is a two-lane road through the study area. The roadway is classified as principal arterial by Caltrans and as Class P-2 by the *OCP*. UVP has a posted speed limit of 50 mph.

Unnamed Frontage Road ("Rodeo Drive") is a two-lane road in the study area, east of US-101, which serves existing farmland, a few businesses, and the Elks Unocal Event Center. Rodeo Drive provides access to/from Santa Maria Way. The roadway is not included in the Caltrans and *OCP* functional classification systems. In this study, Rodeo Drive is assumed to be a Secondary 1 (Class S-1) roadway as it fits the *OCP* description for this functional classification.

2.2. TRAFFIC VOLUMES

Psomas obtained traffic volume data from multiple sources, including the City of Santa Maria, various existing traffic studies, new counts conducted for this TIS, and Caltrans. The existing data from the various sources is from 2018, with all remaining project-specific counts from 2019. Volume information for various facilities is described below.

2.2.1. Intersections

Much of the existing data included only weekday peak period information; however, due to the nature of this project, volumes were collected during the Santa Maria Elks Unocal Event Center Rodeo on Saturday, June 1, 2019 from 3:30 to 9:30 PM at the study intersections by National Data & Surveying Services for Psomas. The overall Saturday peak hour was determined to be from 4:30 to 5:30 PM based on the counts; however, when considering the intersections which serve most (if not all) of the event traffic, the peak hour was found to be from 8:30 to 9:30 PM (when people are leaving the Elks Unocal Event Center).

The earlier Saturday peak hour (4:30 – 5:30 PM) has overall lower volumes than the weekday AM and PM peak hours, both of which are included in the analysis. Because the weekday data was obtained from various sources, the AM and PM peak hours vary by intersection; however, for all intersections, the AM peak hour is one hour between 7:00 and 9:00 AM and the PM peak hour is one hour between 4:00 and 6:00 PM. Therefore, this study used the later/event peak hour (8:30 to 9:30 PM) for the weekend analysis. Figure 4 shows the existing vehicular traffic volumes, and Appendix B includes the collected traffic volume data.

2.2.2. Caltrans Segments

Psomas obtained daily volumes on the US-101 mainline from the Caltrans *Performance Measurement System (PeMS).*[7] Psomas then estimated weekday peak hour and weekend event traffic volumes on the mainline segments based on the K factors available in the Caltrans *Peak Hour Volume Data* report.[8] Traffic volume figures throughout this TIS show the daily volumes rounded to the nearest hundred, as is typical for estimated volumes.

2.2.3. Caltrans Ramps

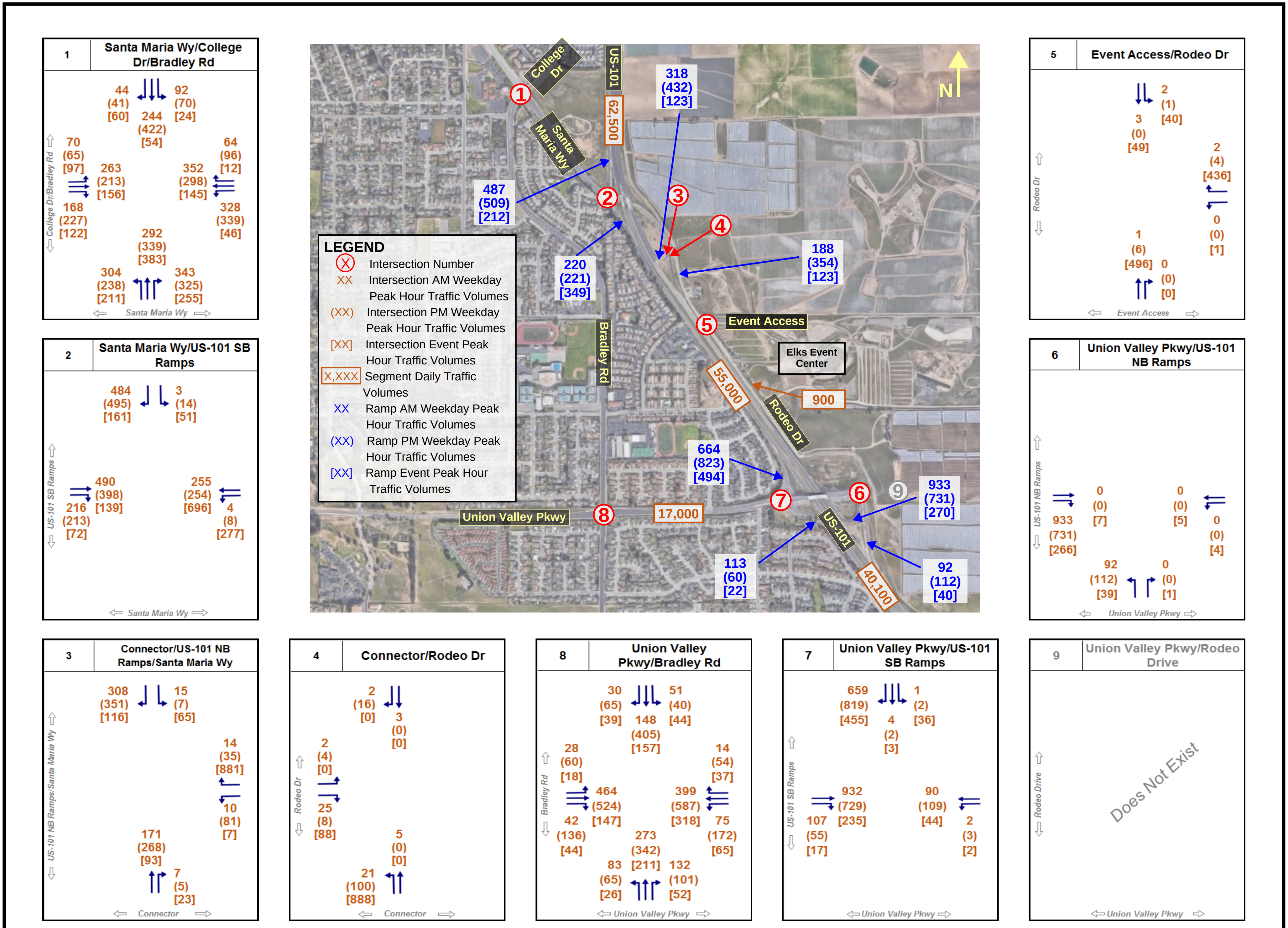
Psomas calculated peak hour volumes on the ramps based on the intersection volumes at the ramp intersections with Santa Maria Way and UVP. Because there are no access points between the ramp merge and diverge points and the intersections, the ramp volumes should match what arrives/leaves the associated intersection.

2.2.4. Arterial Roadway Segments

Psomas estimated daily volumes on the two study segments on Rodeo Drive and on UVP from the turning movement counts at intersections. Traffic volume figures throughout this study will show the daily volumes rounded to the nearest 100, as is typical for estimated volumes.

2.3. COLLISION ANALYSIS

A review of the most recent five years of collision data (January 2014 to December 2018) in the *California Transportation Injury Mapping System (TIMS)*[9] showed that there were no crashes at the existing Santa Maria Way/US-101 interchange, including the ramps. Further, there were two rear-end crashes that resulted in possible injuries at the UVP/US-101 southbound ramps, one in 2016 and one in 2018. However, stakeholders in the area have expressed concerns about safety in the existing Santa Maria/US-101 interchange area, and a site visit conducted by the County revealed potential safety issues. There are high speeds in the area, poor sight distance, multiple horizontal curves, and an atypical intersection which may cause confusion. Overall, the perception of safety in the Santa Maria/US-101 interchange area is poor despite the minimal collision history.



Orcutt Community Plan Amendment Traffic Study

Figure 4. Existing Traffic Volumes

PSOMAS

May 2020

3. PROJECTED TRAFFIC VOLUMES

3.1. OPENING YEAR (2025)

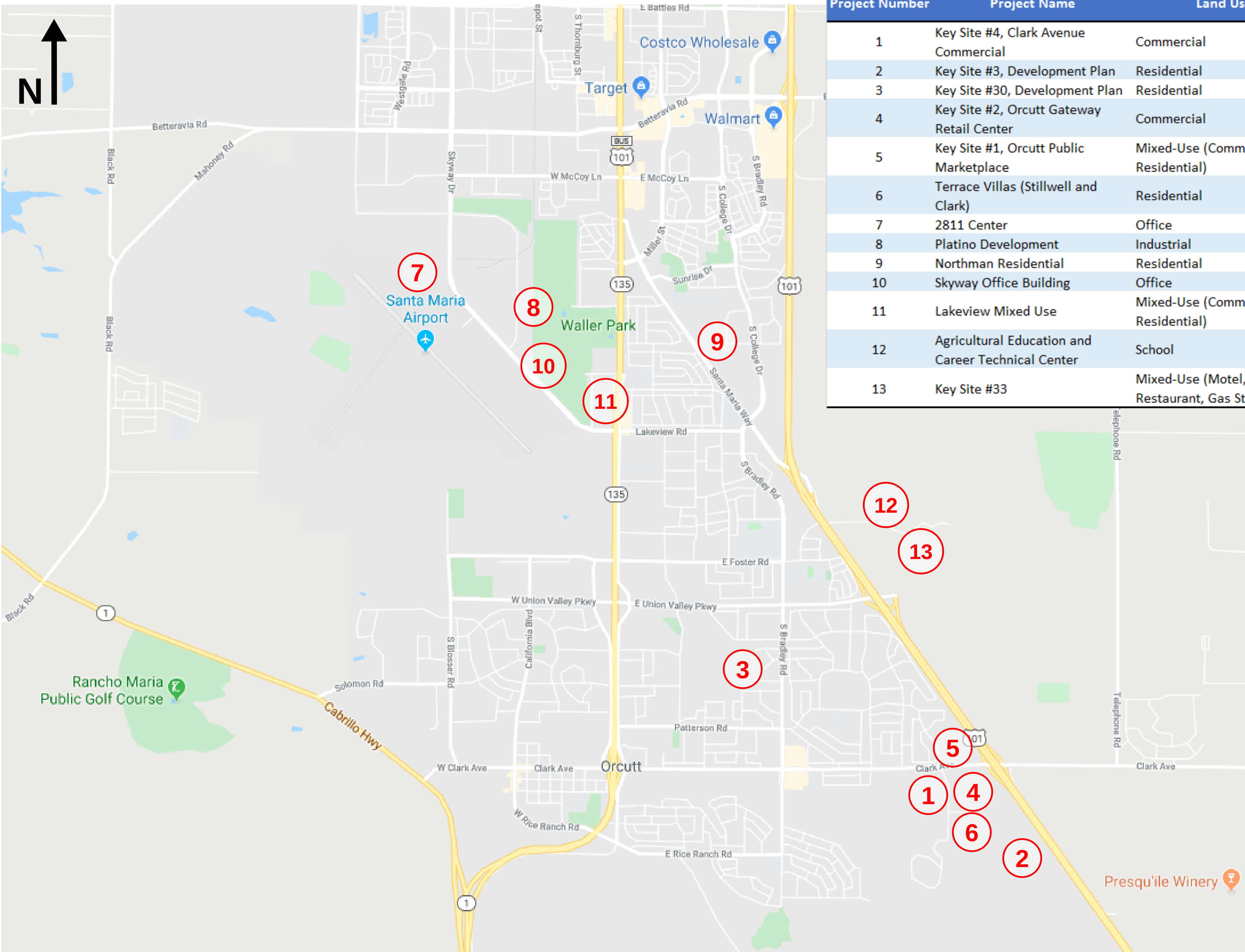
The City of Santa Maria and the County provided traffic information for related projects. Based on the available data, there are 12 developments in the project vicinity which were included in the calculation of 2025 volumes for this study. Note that some projects are large and are unlikely to be completed by 2025 but were included in their entirety to provide a conservative analysis. Figure 5 shows the project locations and land uses.

Psomas estimated the trip generation for the related projects using the Institute of Transportation Engineers (ITE) *Trip Generation Manual*[10] for weekday and Saturday peak hour trips. Saturday evening rates are not generally available; therefore, Psomas estimated the trip generation for Saturday evening using information from the ITE *Parking Generation Manual.*[11] Ratios of parking during the typical Saturday peak period and Saturday evening were calculated for residential and commercial developments, and that ratio was then applied to the trip generation rates. The inbound and outbound splits were assumed to be flipped from what they are for the actual Saturday peak hour for each use. For example, a retail center typically has 52% of trips inbound during the Saturday peak and 48% outbound; for the evening peak used in this study, it was assumed that trips generated by the same retail center would include 48% inbound and 52% outbound.

Table 3 shows the trip generation for each of the 12 related projects. The combined related project volumes are shown in Figure 6, and the cumulative 2025 volumes are shown in Figure 7.

3.2. LONG TERM (2040)

This study used information from the SBCAG *Regional Growth Forecast 2050 Santa Barbara County*[12] to estimate 2040 traffic volumes. The forecast indicated a 0.3% per year growth rate between 2025 and 2040 for the Santa Maria/Guadalupe/Cuyama area; to be conservative, an annual growth rate of 0.4% per year was used. The growth rate was applied to 2025 cumulative volumes.



Project Number	Project Name	Land Use
1	Key Site #4, Clark Avenue Commercial	Commercial
2	Key Site #3, Development Plan	Residential
3	Key Site #30, Development Plan	Residential
4	Key Site #2, Orcutt Gateway Retail Center	Commercial
5	Key Site #1, Orcutt Public Marketplace	Mixed-Use (Commercial and Residential)
6	Terrace Villas (Stillwell and Clark)	Residential
7	2811 Center	Office
8	Platino Development	Industrial
9	Northman Residential	Residential
10	Skyway Office Building	Office
11	Lakeview Mixed Use	Mixed-Use (Commercial and Residential)
12	Agricultural Education and Career Technical Center	School
13	Key Site #33	Mixed-Use (Motel, Restaurant, Gas Station)

Figure 5. Related Projects

Table 3. Related Project Trip Generation (2025)

Project	Development	Units	Number of Units	AM		PM		Saturday (Event)	
				In	Out	In	Out	In	Out
1	**Key Site #4, Clark Avenue Commercial**								
	Shopping Center	1,000 SF	4.0	2	1	7	8	5	5
	Pass-By Trips/Internal Capture			*-1*	*0*	*-2*	*-3*	*-2*	*-2*
	Total Trips - Related Project 1			2	1	5	5	3	3
2	**Key Site #3, Development Plan**								
	Single Family Residential	Units	125	23	69	78	46	25	30
	Multifamily Housing (Low-Rise)	Units	160	17	57	56	33	41	12
	Pass-By Trips/Internal Capture			*0*	*0*	*0*	*0*	*0*	*0*
	Total Trips - Related Project 2			40	126	134	79	66	42
3	**Key Site #30, Development Plan**								
	Multifamily Housing (Low-Rise)	Units	212	24	73	75	44	54	16
	Pass-By Trips/Internal Capture			*0*	*0*	*0*	*0*	*0*	*0*
	Total Trips - Related Project 3			24	73	75	44	54	16
4	**Key Site #2, Orcutt Gateway Retail Center**								
	Shopping Center	1,000 SF	49.921	29	18	91	99	60	65
	Pass-By Trips/Internal Capture			*-10*	*-6*	*-31*	*-34*	*-20*	*-22*
	Total Trips - Related Project 4			19	12	60	65	39	43
5	**Key Site #1, Orcutt Public Marketplace**								
	Single Family Residential	Units	252	47	140	157	92	51	60
	Shopping Center	1,000 SF	211.264	123	75	386	419	253	274
	Pass-By Trips/Internal Capture			*-47*	*-40*	*-147*	*-152*	*-91*	*-99*
	Total Trips - Related Project 5			123	176	396	359	213	235
6	**Terrace Villas (Stillwell and Clark)**								
	Single Family Residential	Units	16	3	9	10	6	3	4
	Pass-By Trips/Internal Capture			*0*	*0*	*0*	*0*	*0*	*0*
	Total Trips - Related Project 6			3	9	10	6	3	4
7	**2811 Center**								
	General Office	1,000 SF	25.6	26	4	5	25	0	0
	Pass-By Trips/Internal Capture			*0*	*0*	*0*	*0*	*0*	*0*
	Total Trips - Related Project 7			26	4	5	25	0	0
8	**Platino Development**								
	General Light Industrial	1,000 SF	48.717	30	4	4	27	0	0
	Pass-By Trips/Internal Capture			*0*	*0*	*0*	*0*	*0*	*0*
	Total Trips - Related Project 8			30	4	4	27	0	0
9	**Northman Residential**								
	Single Family Residential	Units	63	12	35	39	23	13	15
	Pass-By Trips/Internal Capture			*0*	*0*	*0*	*0*	*0*	*0*
	Total Trips - Related Project 9			12	35	39	23	13	15
10	**Skyway Office Building**								
	General Office	1,000 SF	19.8	20	3	4	19	0	0
	Pass-By Trips/Internal Capture			*0*	*0*	*0*	*0*	*0*	*0*
	Total Trips - Related Project 10			20	3	4	19	0	0
11	**Lakeview Mixed Use**								
	Multifamily Housing (Low-Rise)	Units	230	24	81	81	48	58	17
	Shopping Center	1,000 SF	11.0	6	4	20	22	13	14
	Pass-By Trips/Internal Capture			*-5*	*-9*	*-15*	*-12*	*-10*	*-7*
	Total Trips - Related Project 11			26	76	86	57	61	25
12	**Agricultural Education and Career Technical Center**								
	Technical High School	Students	198	69	34	13	14	12	7
	Pass-By Trips/Internal Capture			*0*	*0*	*0*	*0*	*0*	*0*
	Total Trips - Related Project 12			69	34	13	14	12	7
Total New Trips				**393**	**553**	**832**	**724**	**465**	**390**

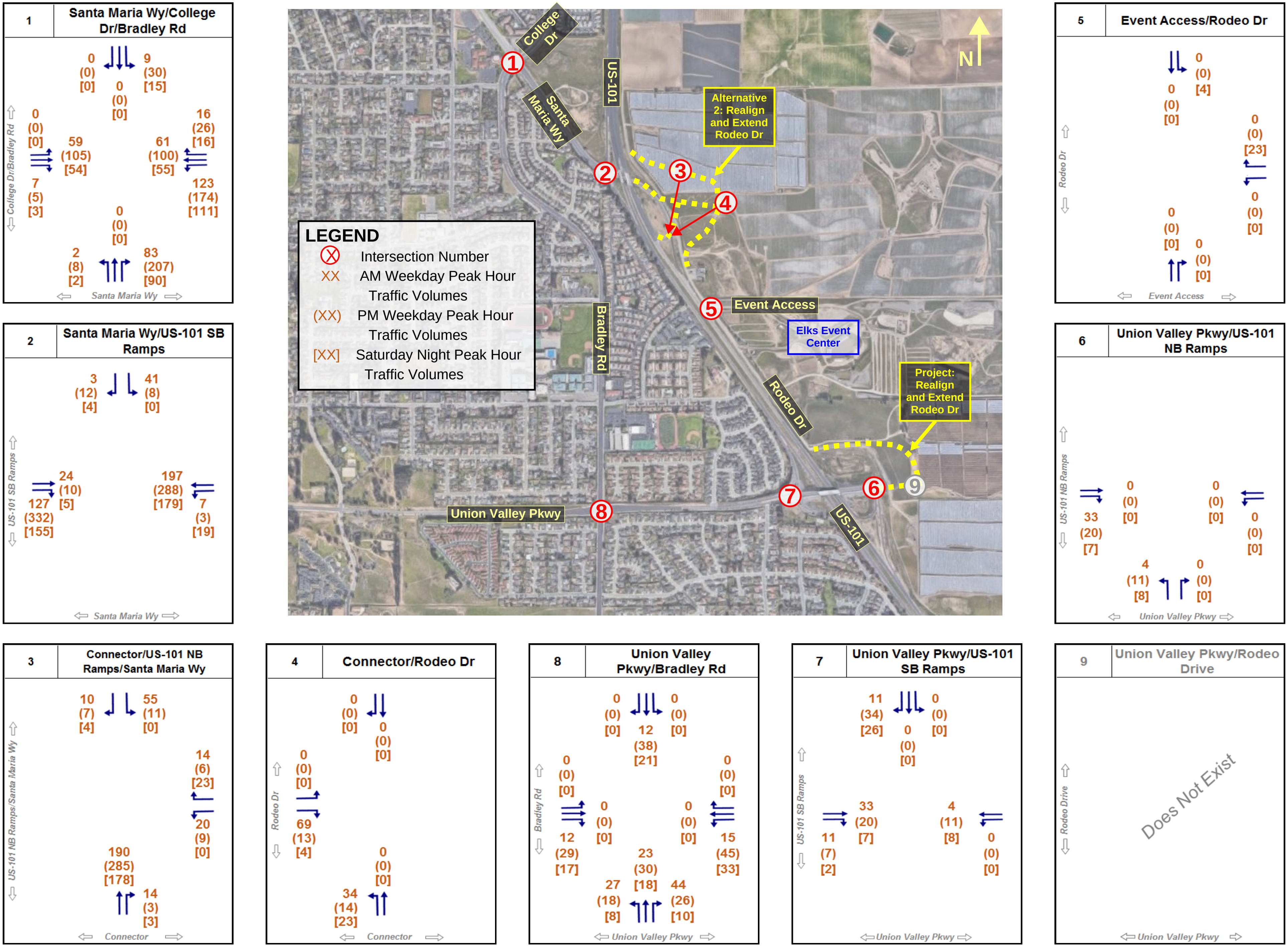


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Figure 6. Related Projects Traffic Volumes

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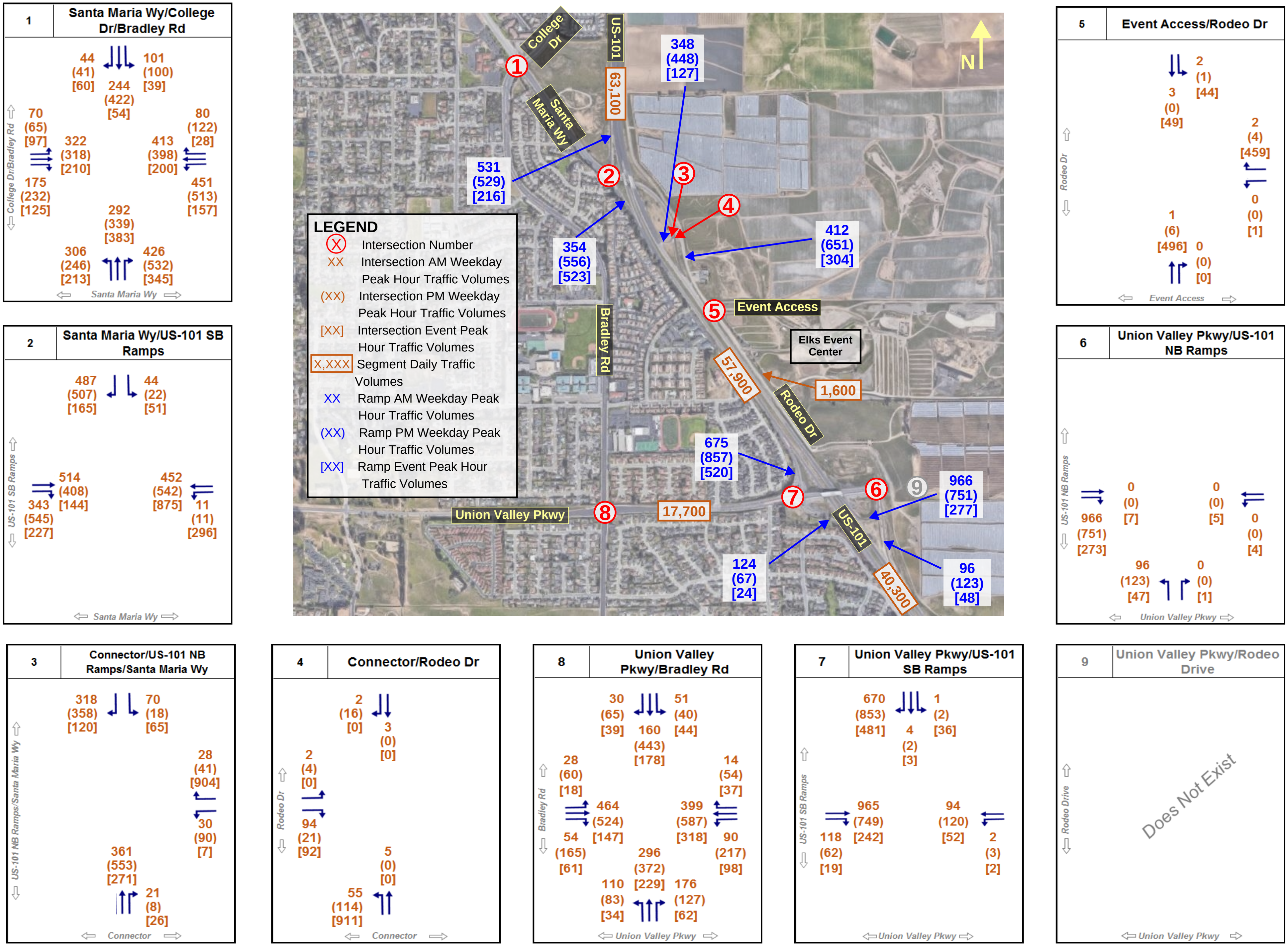


Figure 7. Existing + Opening Year (2025) Cumulative Traffic Volumes

In addition, the *OCP* includes site-specific analysis and potential buildout characteristics for all the Key Sites, including Key Site 33. The expected land uses for Key Site 33 include construction of the Elks Unocal Event Center rodeo facility, a 150 space RV park, three motels (50-80 rooms each), two fast food restaurants, one sit-down restaurant, and a convenience market/gas station. Several of the parcels in Key Site 33 have been developed since the adoption of the *OCP*, including the Elks Unocal Event Center and SMJUHSD Agricultural Education and Career Technical Center. As a result, detailed information about trip generation and site development was not available in the *OCP* Environmental Impact Report[13]. Therefore, with guidance from the County, this study assumed that by 2040, Key Site 33 would include the following expected uses:

- Three 80-room motels (240 total rooms)
- One 5,000 square-foot fast food restaurant with drive thru
- One gas station with a 1,800 square foot convenience store

Table 4 shows the traffic volumes expected to be generated by this portion of Key Site 33 in 2040. Psomas distributed those volumes and were added to the grown volumes to determine the 2040 cumulative (long-term) volumes without the project, which are shown in Figure 8.

Table 4. Key Site 33: Related Project Trip Generation (2040)

Project	Development	Units	Number of Units	AM		PM		Saturday (Event)	
				In	Out	In	Out	In	Out
	Key Site #33								
13	Motel	Rooms	240	34	57	49	42	22	21
	Fast Food with Drive Thru	1,000 SF	5.0	102	98	85	78	75	78
	Gas Station with Convenience Store	1,000 SF	1.8	70	67	81	78	61	61
	Pass-By Trips/Internal Capture			*-60*	*-70*	*-70*	*-65*	*-45*	*-44*
	Total Trips - Related Project 12			146	153	145	134	113	115
Total New Trips				**146**	**153**	**145**	**134**	**113**	**115**

1 | Santa Maria Wy/College Dr/Bradley Rd

47 (44) [64] | 259 (448) [57] | 115 (113) [47]

74 (69) [103]
371 (367) [245]
186 (246) [133]

93 (136) [35]
469 (449) [235]
502 (565) [184]

310 (360) [407]

325 (261) [226] | 474 (587) [383]

College Dr/Bradley Rd
Santa Maria Wy

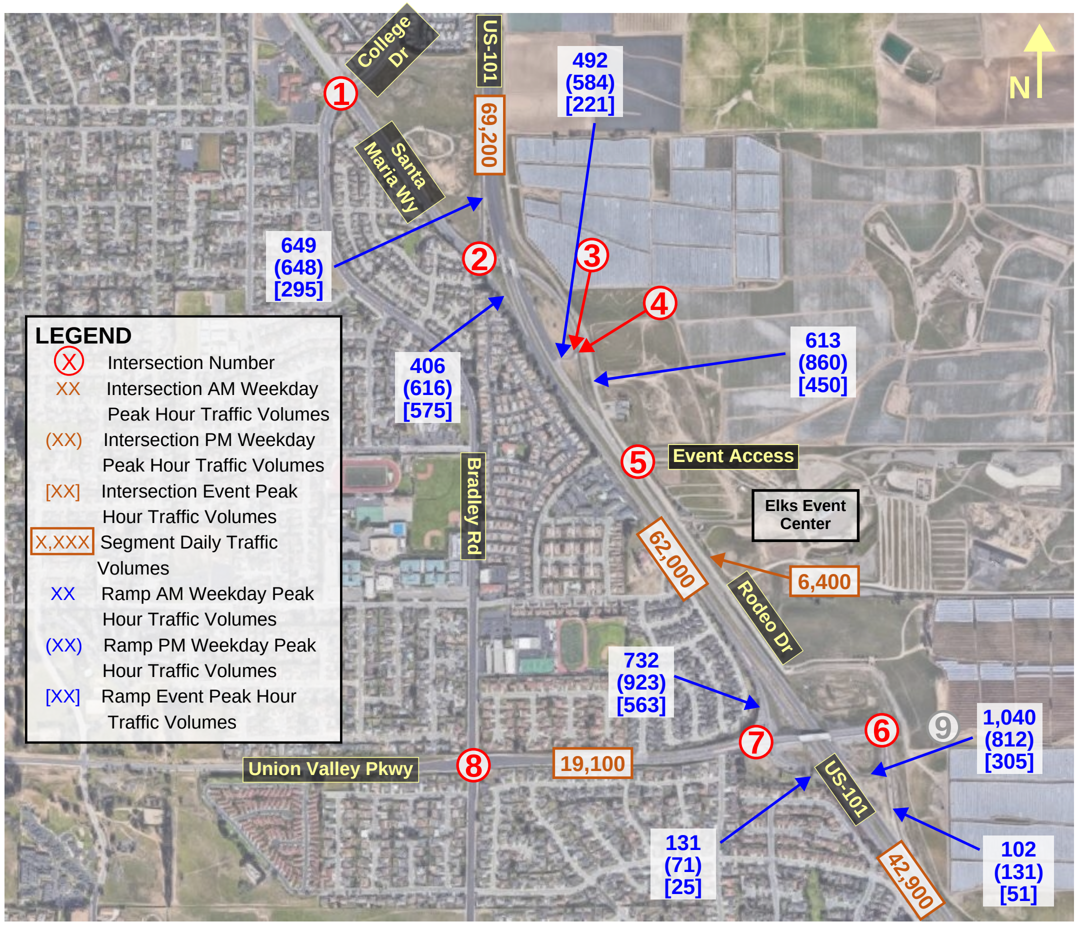
2 | Santa Maria Wy/US-101 SB Ramps

517 (538) [175] | 132 (110) [120]

613 (502) [205]
355 (568) [234]

541 (629) [975]
51 (48) [341]

US-101 SB Ramps
Santa Maria Wy



5 | Event Access/Rodeo Dr

2 (1) [47]
3 (0) [52]

2 (4) [487]
0 (0) [1]

1 (6) [527]
0 (0) [0]

Rodeo Dr
Event Access

6 | Union Valley Pkwy/US-101 NB Ramps

0 (0) [7]
1,040 (812) [301]

0 (0) [5]
0 (0) [4]

102 (131) [50] | 0 (0) [1]

US-101 NB Ramps
Union Valley Pkwy

3 | Connector/US-101 NB Ramps/Santa Maria Wy

338 (380) [127] | 227 (174) [186]

131 (133) [1033]
154 (204) [94]

383 (587) [288] | 76 (69) [68]

US-101 NB Ramps/Santa Maria Wy
Connector

4 | Connector/Rodeo Dr

2 (17) [0] | 3 (0) [0]

2 (4) [0]
306 (238) [256]

5 (0) [0]

281 (319) [1126]

Rodeo Dr
Connector

8 | Union Valley Pkwy/Bradley Rd

32 (69) [41] | 170 (470) [189] | 59 (47) [50]

30 (64) [19]
500 (564) [162]
57 (175) [65]

19 (61) [43]
431 (630) [343]
99 (233) [106]

117 (88) [36] | 314 (395) [243] | 190 (138) [68]

Bradley Rd
Union Valley Pkwy

7 | Union Valley Pkwy/US-101 SB Ramps

727 (919) [522] | 4 (2) [3] | 1 (2) [38]

1,039 (810) [268]
125 (66) [20]

100 (127) [55]
2 (3) [2]

US-101 SB Ramps
Union Valley Pkwy

9 | Union Valley Pkwy/Rodeo Drive

Does Not Exist

Rodeo Drive
Union Valley Pkwy

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Figure 8. Long Term (2040) Traffic Volumes

PSOMAS

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4. OPERATIONAL ANALYSIS – PROJECT

4.1. PROJECT TRAFFIC VOLUME PROJECTIONS

4.1.1. Trip Distribution

Figure 9 shows the project trip distribution for each study intersection and for the main routes within the study area. This study estimated distribution based on existing traffic distribution and potential shifts in travel patterns which are expected to occur with the extension of Rodeo Drive and UVP and the construction of a new intersection connecting those two roadways.

With the exiting geometry, the only way to access the Elks Unocal Event Center is via Santa Maria Way. With the project, portions of these trips (generally from the west and south of the study area) are expected to use the extended UVP to access Rodeo Drive, then travel north to the Elks Unocal Event Center. As shown in Figure 9, traffic on Santa Maria Way is expected to decrease significantly with the project. Volumes on UVP, including at the interchange, will increase.

4.1.2. Traffic Volumes

Using the project trip generation and trip distribution, the project traffic volumes at each of the study intersections, segments, and ramps were calculated. Figures 10, 11, and 12 show project traffic volumes for the existing analysis year (2019), the opening year analysis year (2025), and the long-term analysis year (2040), respectively. Negative volumes represent vehicles that would use a different travel path after the project is completed. This is consistent with the distribution in Figure 9; traffic volumes are expected to decrease in the area of Santa Maria Way and will increase on UVP with the project.

The total estimated traffic volumes for the existing analysis year (2019), the opening year analysis year (2025), and the long term analysis year (2040) are shown in Figures 13, 14, and 15, respectively. Total volumes are calculated by adding the without-project traffic volumes (Figures 6, 7, and 8) and the project traffic volumes (Figures 10, 11, and 12).

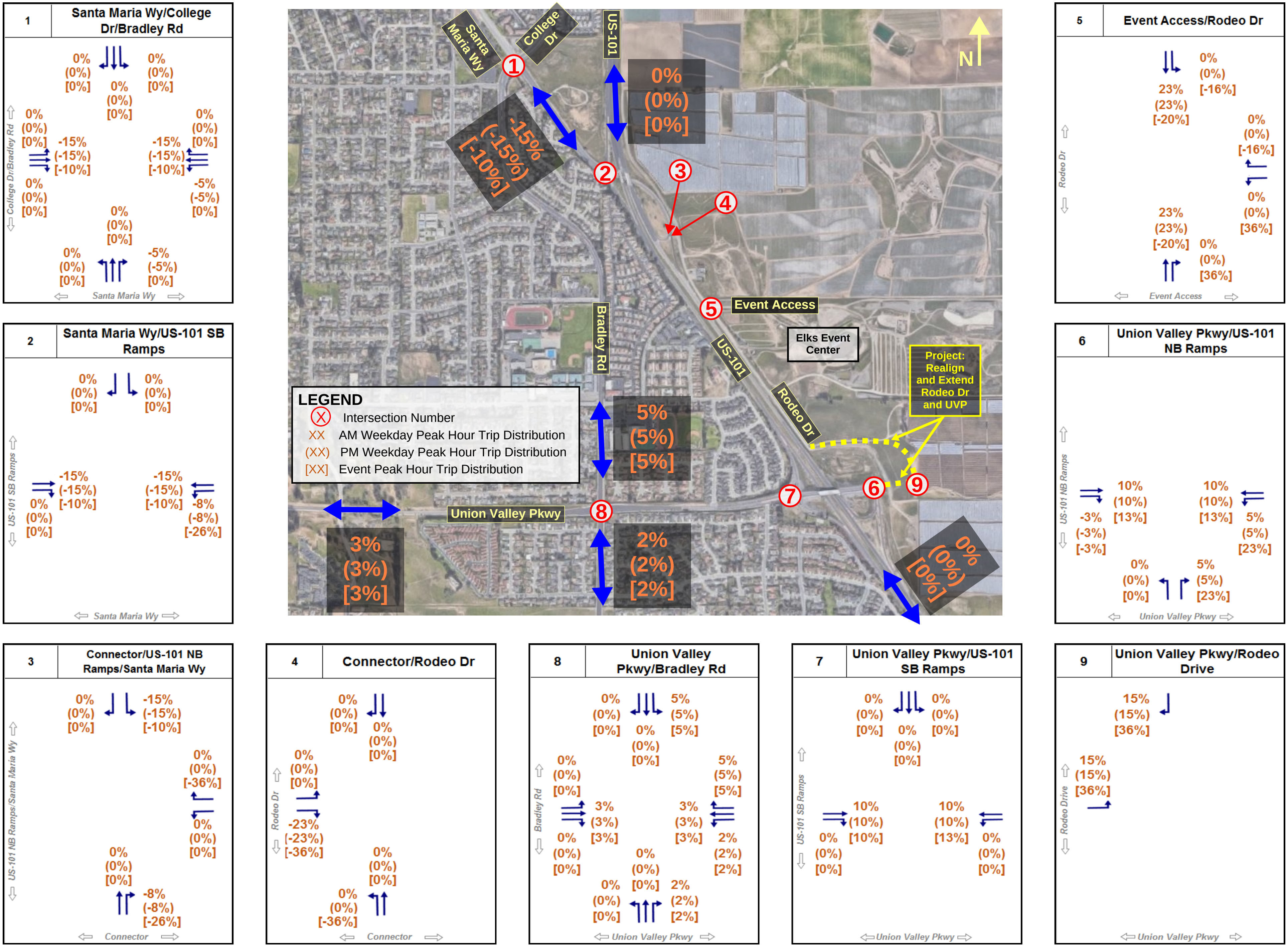

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Figure 9. Project Trip Distribution

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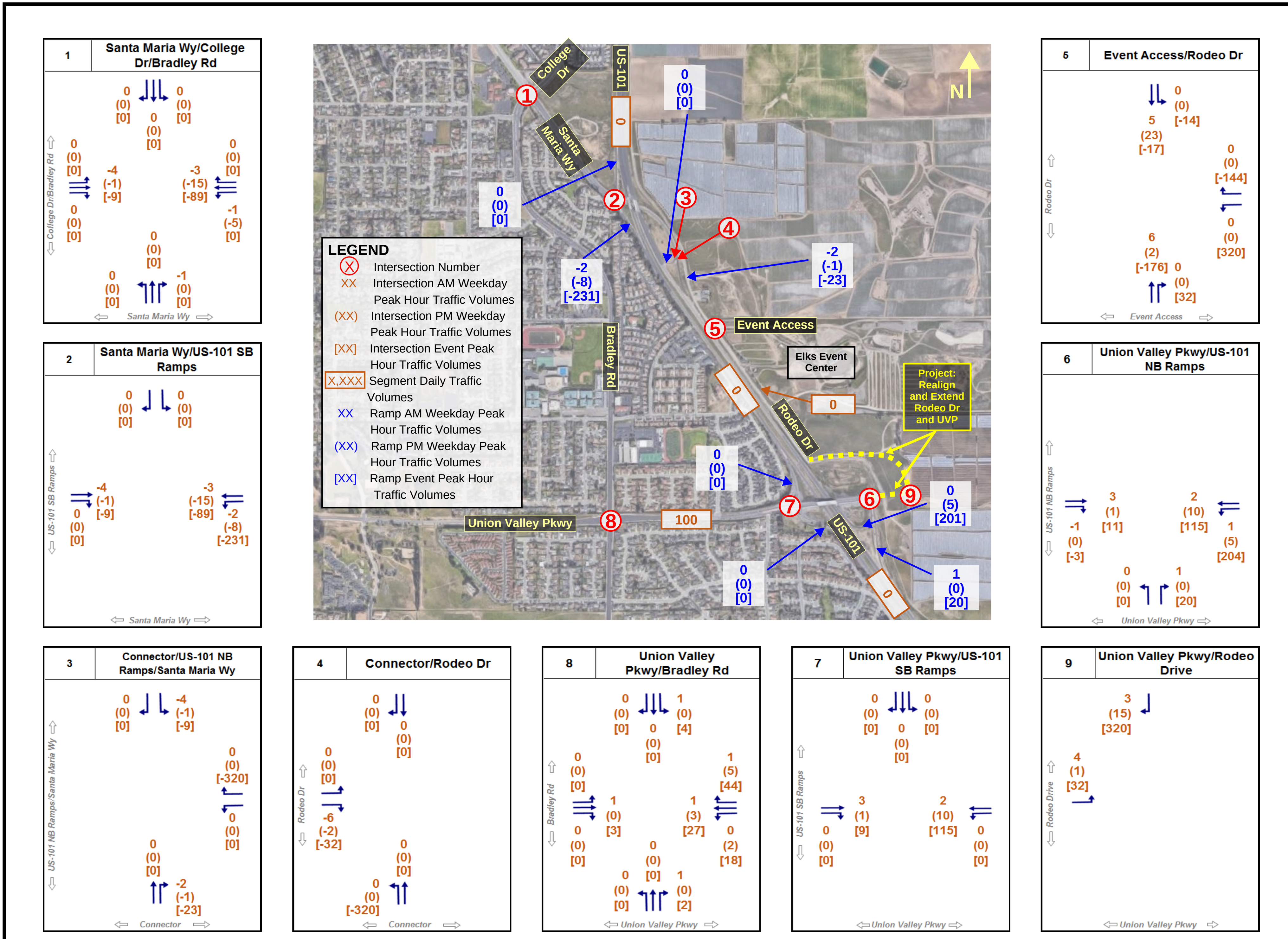

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Figure 10. Project Traffic Volumes - 2019

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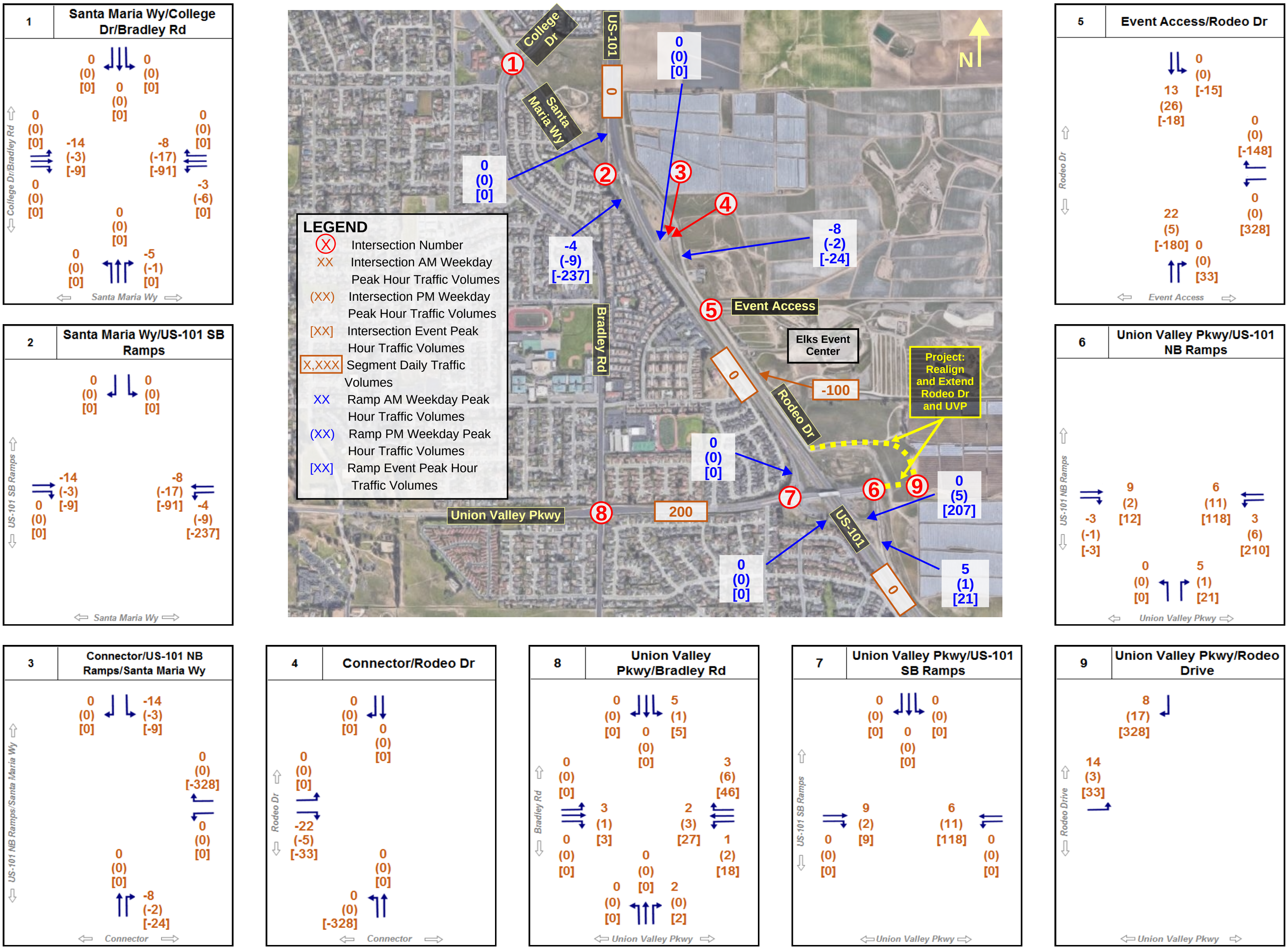

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Figure 11. Project Traffic Volumes - Opening Year (2025)

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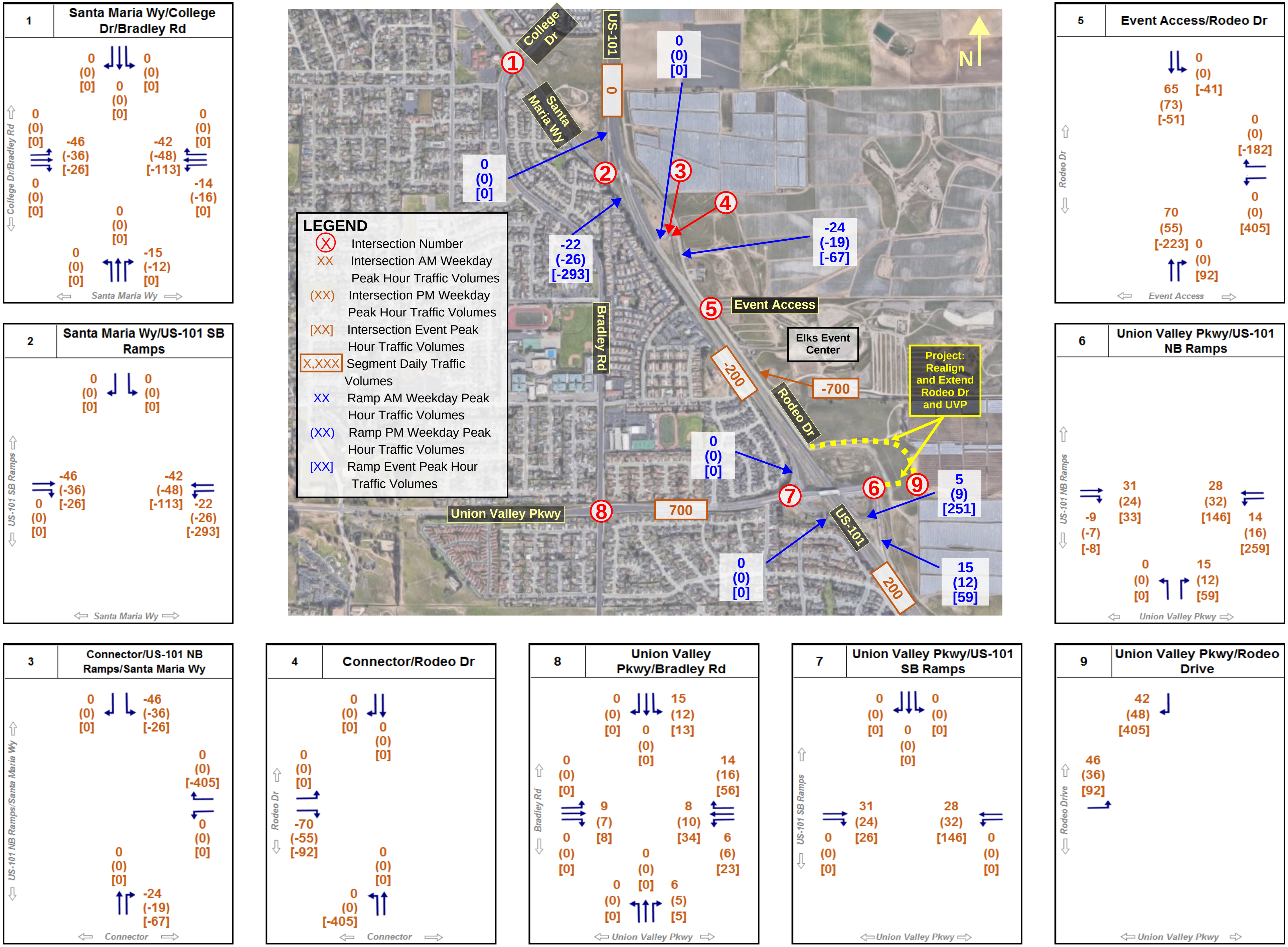

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Figure 12. Project Traffic Volumes - Long Term (2040)

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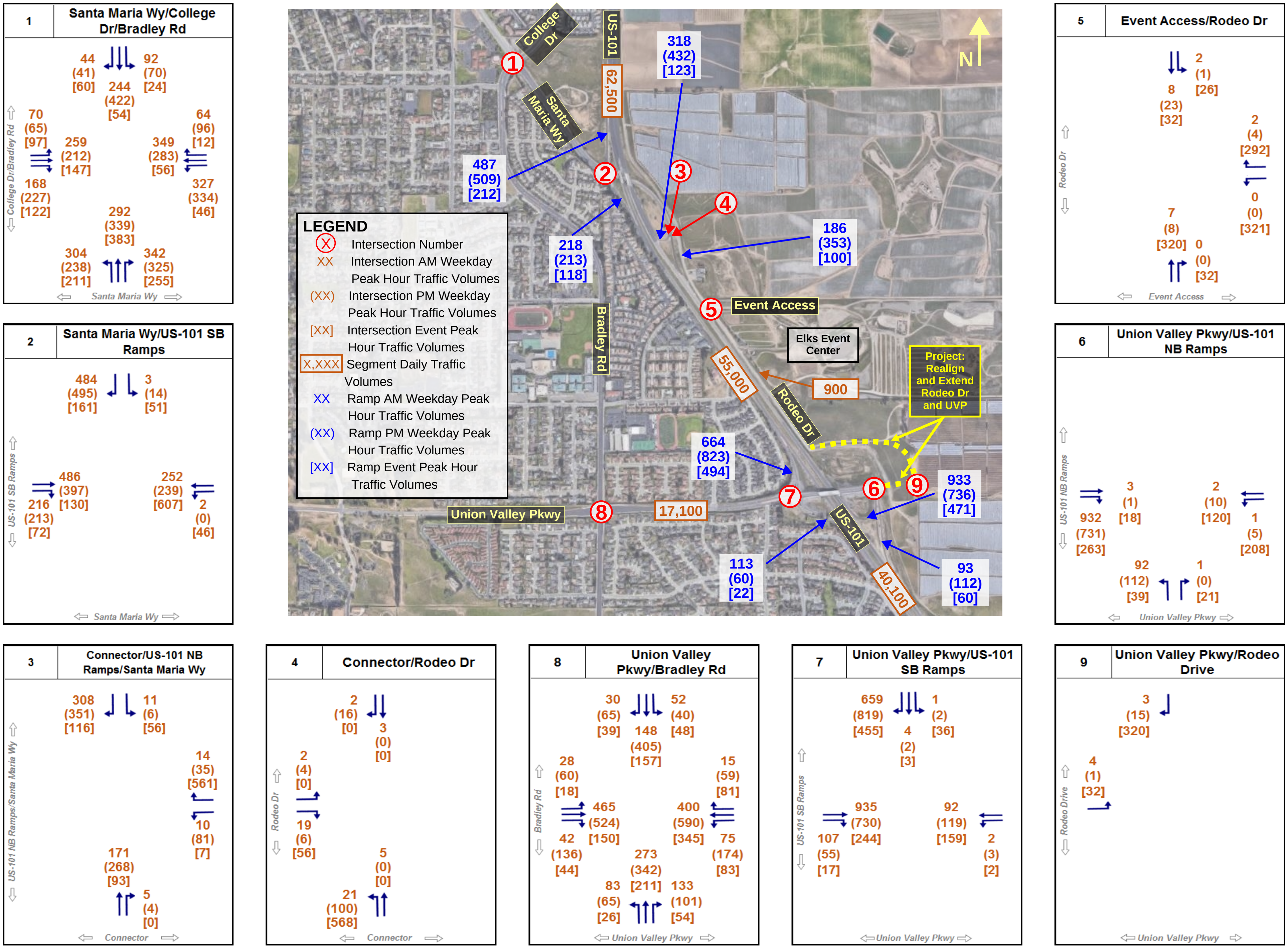

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Figure 13. Existing + Project Traffic Volumes

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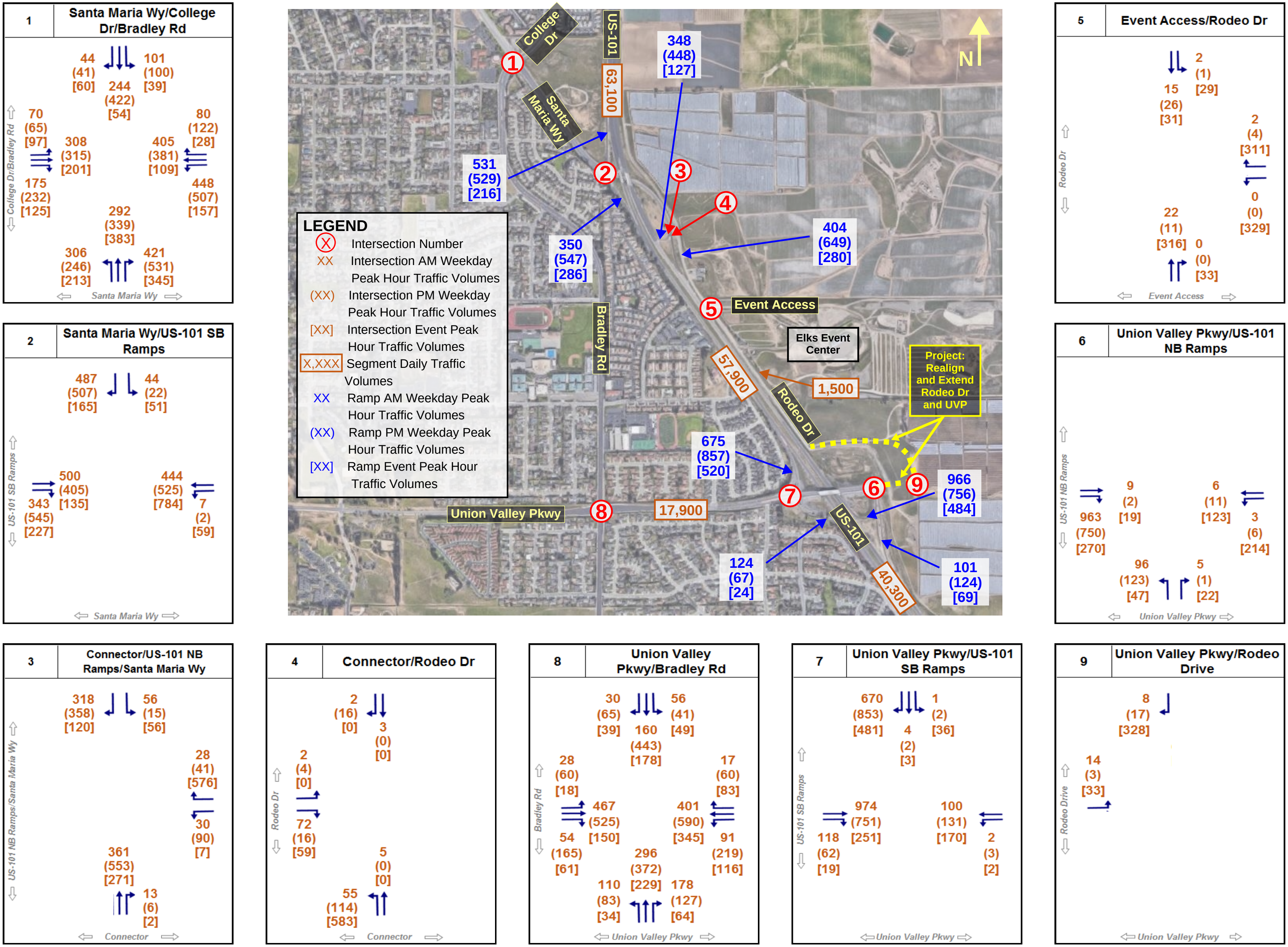
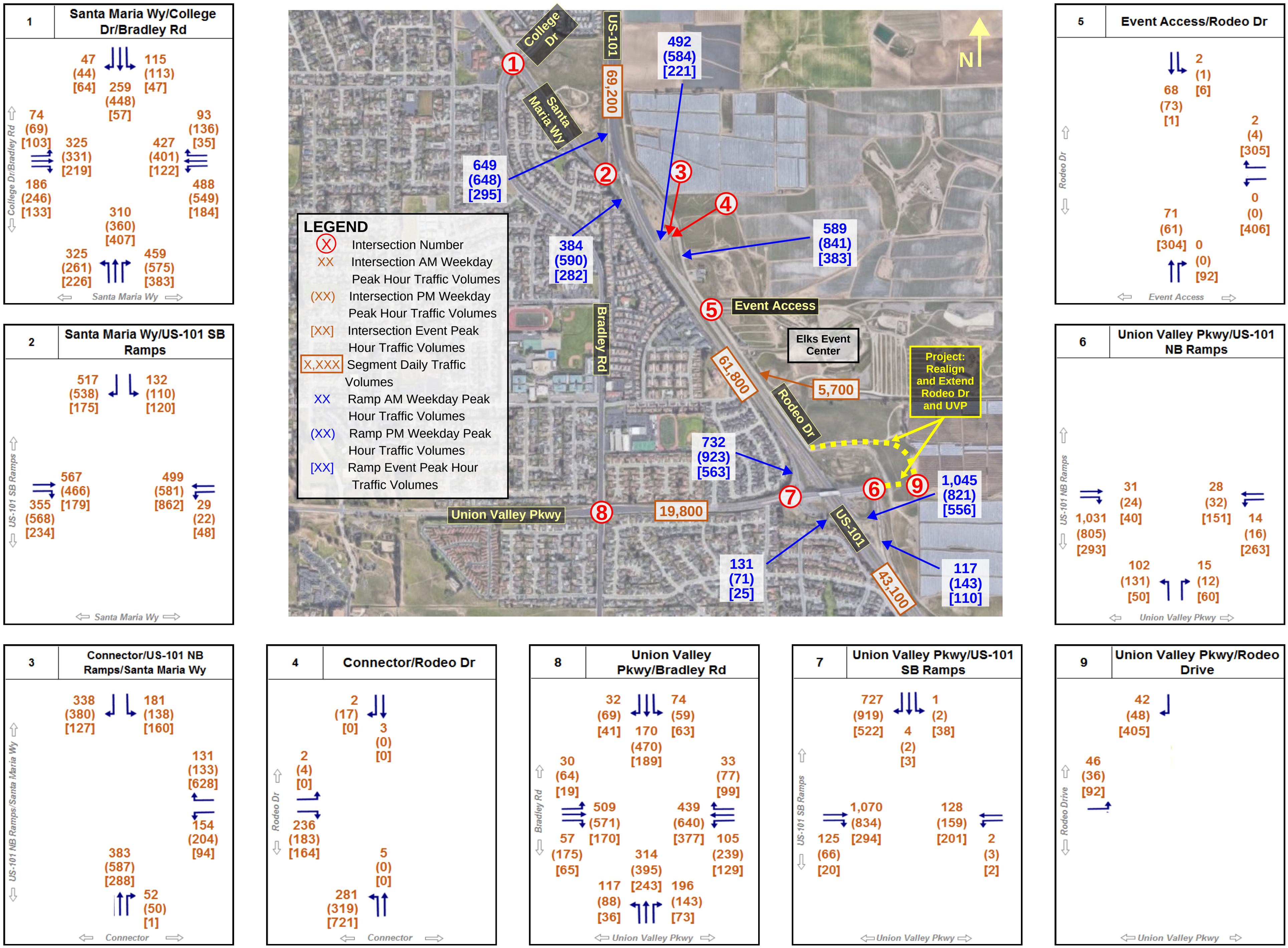


Figure 14. Existing + Cumulative + Project Traffic Volumes (2025)



Orcutt Community Plan Amendment Traffic Study	*Figure 15. Long Term (2040) Plus Project Traffic Volumes*	PSOMAS	May 2020

4.2. OPERATIONAL ANALYSIS – EXISTING CONDITIONS WITH AND WITHOUT PROJECT

As previously discussed, Psomas evaluated the signalized intersections using the ICU methodology and the unsignalized intersections and the Caltrans intersections using *Synchro*.

The purpose of the Existing Plus Project analysis is to provide the baseline for assessing environmental impacts, which is generally the existing conditions at the time that the environmental document for the project is prepared. The analysis assesses the transportation and circulation impacts of the proposed project against existing traffic conditions, irrespective of the proposed project's horizon year.

Figure 13 shows the existing plus project traffic volumes. For existing conditions and existing plus project conditions, the ICU spreadsheets and *Synchro* reports are included in Appendix C. Table 5 shows the resulting LOS for each of the study intersections under Existing conditions and Existing Plus Project conditions, as well as the significant impact analysis. As seen in Table 5, all the intersections (or worst stop-controlled movements) are expected to operate at LOS C or better with or without the project during weekday AM and PM peak hours, so there are no significant project impacts. Further, the project would improve operations at the Santa Maria Way/US-101 interchange, particularly during large events at the Elks Unocal Event Center.

Under existing plus project conditions, on the weekend, during large special events, the analysis shows that a significant traffic impact is expected at the Elks Unocal Event Center Access/Rodeo Drive intersection per the *OCP* guidelines. However, permanent improvements are not generally recommended for operational issues which occur sporadically, such as those generated by large events at the Elks Unocal Event Center. Because the intersection will serve typical peak period traffic volumes efficiently, no mitigation is recommended at this time.

Table 5. Existing + Project Intersection Analysis

	Intersection	Intersection Control	Existing									Existing Plus Project								
			AM Peak Hour			PM Peak Hour			Sat. Night Peak			AM Peak Hour			PM Peak Hour			Sat. Night Peak		
			Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS
1	Santa Maria Wy/College Dr/Bradley Rd	Signalized		0.66	B		0.74	C		0.43	A		0.69	B		0.78	C		0.43	A
2	Santa Maria Wy/US-101 SB Ramps	Unsignalized*	15.6		C	14.7		B	105.3		F	15.4		C	14.1		B	20.2		C
3	Santa Maria Wy/US-101 NB Ramps	Unsignalized*	9.5		A	11.2		B	57.7		F	9.5		A	11.1		B	15.4		C
4	Santa Maria Wy/Connector/US-101 NB Ramps	Unsignalized*	8.5		A	9.0		A	10.4		B	8.5		A	9.1		A	8.6		A
5	Elks Access/Rodeo Dr	Unsignalized**	8.3		A	8.4		A	42.1		E	8.4		A	8.4		A	95.3		F
6	Union Valley Pkwy/US-101 NB Ramps	Unsignalized*			A			A			A	10.3		B	9.4		A	8.4		A
7	Union Valley Pkwy/US-101 SB Ramps	Unsignalized*	11.6		B	13.8		B	10.1		B	12.5		B	15.7		C	11.6		B
8	Union Valley Pkwy/Bradley Rd	Signalized		0.39	A		0.51	A		0.30	A		0.39	A		0.51	A		0.31	A
9	Union Valley Pkwy/Rodeo Dr	Unsignalized**			A			A			A	8.5		A	8.6		A	9.6		A

*Caltrans Intersection

**TWSC (delay shows highest lane delay)

Highlighted cells indicate LOS E or F OR indicate significant impact

		Increase in Delay (Caltrans E or F only)			Increase in V/C			Significant Impact?		
		AM	PM	Sat	AM	PM	Sat	AM	PM	Sat
1	Santa Maria Wy/College Dr/Bradley Rd				0.02	0.04	0.00	NO	NO	NO
2	Santa Maria Wy/US-101 SB Ramps	N/A	N/A	-85.1				NO	NO	NO
3	Santa Maria Wy/US-101 NB Ramps	N/A	N/A	-42.3				NO	NO	NO
4	Santa Maria Wy/Connector/US-101 NB Ramps	N/A	N/A	N/A				NO	NO	NO
5	Elks Access/Rodeo Dr	N/A	N/A	53.2				N/A	N/A	YES
6	Union Valley Pkwy/US-101 NB Ramps	N/A	N/A	N/A				NO	NO	NO
7	Union Valley Pkwy/US-101 SB Ramps	N/A	N/A	N/A				NO	NO	NO
8	Union Valley Pkwy/Bradley Rd				0.00	0.00	0.01	NO	NO	NO
9	Union Valley Pkwy/Bradley Rd	N/A	N/A	N/A				N/A	N/A	N/A

In addition to the study intersections, Psomas evaluated the three Caltrans study segments on US-101 or existing and existing plus project conditions, as shown in Table 6 and the HCS reports are included in Appendix F. As shown in Table 6, all segments should operate at LOS D or better, so there are no significant project impacts per the Caltrans guidelines. However, it should be noted that LOS D is not consistent with the *OCP.*

Table 6. Existing + Project Caltrans Mainline Segment Analysis

Existing (2019)		AM		PM		Saturday	
		Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS
No Build	Northbound, S of UVP	15.5	B	19.0	C	7.8	A
	Southbound, S of UVP	15.5	B	19.0	C	7.8	A
	Northbound, UVP to SMW	22.7	C	28.5	D	11.3	B
	Southbound, UVP to SMW	20.0	C	24.5	C	10.0	A
	Northbound, N of SMW	16.1	B	19.7	C	5.7	A
	Southbound, N of SMW	24.3	C	31.4	D	8.6	A
With Proposed Project	Northbound, S of UVP	15.5	B	19.0	C	7.8	A
	Southbound, S of UVP	15.5	B	18.9	C	5.8	A
	Northbound, UVP to SMW	22.6	C	28.5	D	12.9	B
	Southbound, UVP to SMW	20.0	C	24.6	C	8.1	A
	Northbound, N of SMW	16.1	B	19.7	C	6.8	A
	Southbound, N of SMW	24.4	C	31.6	D	8.6	A

The operational analysis for the Caltrans ramps is shown in Table 7 and the HCS reports are included in Appendix I. All ramps are expected to operate at LOS D or better with the project; therefore, there are no significant impacts due to the project. As previously noted, although LOS D is not consistent with the *OCP*, there are no capacity thresholds for ramps in the *OCP.*

Table 7. Existing + Project Caltrans Ramp Analysis

			SB Off-Ramp		SB On-Ramp		NB Off-Ramp		NB On-Ramp	
			Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS
Santa Maria Wy	Existing	AM	17.2	B	25.1	C	20.8	C	16.7	B
		PM	23.1	C	30.4	D	26.2	C	20.6	C
		Sat Event	0.1	A	10.5	B	8.5	A	8.5	A
	Existing + Project	AM	17.2	B	25.0	C	20.7	C	16.7	B
		PM	23.1	C	30.3	D	26.3	C	20.7	C
		Sat Event	0.1	A	8.7	A	10.2	B	9.4	A
Union Valley Pkwy	Existing	AM	16.8	B	17.7	B	9.1	A	20.5	C
		PM	21.6	C	21.7	C	12.9	B	22.3	C
		Sat Event	5.9	A	7.1	A	0.7	A	7.5	A
	Existing + Project	AM	16.8	B	17.7	B	9.1	A	20.5	C
		PM	21.6	C	21.6	C	12.9	B	22.3	C
		Sat Event	3.8	A	5.1	A	0.7	A	9.1	A

Lastly, the results for the operational analysis on the two arterial segments on Rodeo Drive and on UVP are shown in Table 8. Note that the daily volumes are rounded to the nearest 100 because most of the volumes are estimated.

OCP Policy CIRC-O-3 defines LOS C as the acceptable LOS for roadways and segments in the plan area. Rodeo Drive is not included in the *OCP*; however, this study considers Rodeo Drive a Class S-1 roadway as it fits the *OCP* description for this functional classification. UVP is classified as primary 2 roadway in the *OCP*. Therefore, the maximum volumes at LOS C are 9,300 vehicles per day for Rodeo Drive and 14,300 vehicles per day for UVP. Further, the design capacities are 11,600 vehicles per day for Rodeo Drive and 17,900 vehicles per day for UVP.

Table 8 shows that Rodeo Drive operates at acceptable LOS with and without the project. Further, UVP operates below its design capacity but does not meet the *OCP*'s acceptable LOS level (C). However, the *OCP* Circulation Element standards state that a primary road, which is the case of UVP, can be consistent with the Community Plan if the LOS at the signalized intersections along the segment operate at the minimum LOS standards (LOS C). For the UVP study segment, the intersections at Bradley Road and the US-101 SB ramps operate at LOS C or better; therefore, operations along UVP are consistent with the *OCP* and no significant impacts are identified.

Table 8. Existing + Project Arterial Segment Analysis

Segment		Existing	Existing + Project
Rodeo Dr (35 mph)	AADT (veh/day)	900	900
	LOS	C or better (Acceptable)	C or better (Acceptable)
UVP (50 mph)	AADT (veh/day)	17,000	17,100
	LOS	E (Not Acceptable, but Consistent with *OCP*)	E (Not Acceptable, but Consistent with *OCP*)

4.3. OPERATIONAL ANALYSIS – EXISTING + CUMULATIVE (2025) CONDITIONS WITH AND WITHOUT PROJECT

As for existing conditions, this study evaluated the signalized intersections using the ICU methodology and the unsignalized intersections and the Caltrans intersections using *Synchro*. Appendix D includes the ICU *spreadsheets* and *Synchro* reports for the opening year of 2025.

Table 9 shows the resulting LOS for each of the study intersections under Existing Plus Cumulative (2025) conditions and Existing Plus Cumulative (2025) Plus Project conditions, as well as the significant impacts analysis. It was assumed that the intersection geometry and traffic control would be unchanged from existing conditions.

As shown in Table 9, the increase in the V/C ratio due to the project at all signalized intersections is lower than the *OCP* thresholds for significant impacts; therefore, there are no significant project impacts at the County signalized intersections, and they are considered to be consistent with the *OCP*. Further, the County unsignalized intersections are expected to operate at LOS A during the weekday AM and PM peak hours; therefore, the County unsignalized intersections are consistent with the *OCP*.

On the weekend, during large special events, a significant traffic impact is expected at the Elks Unocal Event Center Access/Rodeo Drive intersection. However, as previously discussed, permanent improvements are not generally recommended for operational issues which occur sporadically, such as those generated by large events at the Elks Unocal Event Center. Because the intersection will serve typical peak period traffic volumes efficiently, no mitigation is recommended at this time. Lastly, all Caltrans intersections are expected to operate at LOS C or better with the project and, therefore, there are no significant impacts at those intersections.

In addition to the study intersections, this study evaluated the three Caltrans study segments on US-101 for existing plus cumulative conditions with and without the project, as shown in Table 10 and the HCS reports are included in Appendix G. As shown in Table 10, all segments should operate at LOS D or better, so there are no significant project impacts.

Table 9. Existing + Cumulative + Project Intersection Analysis (2025)

	Intersection	Intersection Control	2025 Cumulative									2025 Cumulative Plus Project								
			AM Peak Hour			PM Peak Hour			Sat. Night Peak			AM Peak Hour			PM Peak Hour			Sat. Night Peak		
			Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS
1	Santa Maria Wy/College Dr/Bradley Rd	Signalized		0.77	C		0.89	D		0.50	A		0.77	C		0.89	D		0.43	A
2	Santa Maria Wy/US-101 SB Ramps	Unsignalized*	23.8		C	21.2		C	303.7		F	22.7		C	20.1		C	28.6		D
3	Santa Maria Wy/US-101 NB Ramps	Unsignalized*	11.4		B	15.9		C	186.5		F	11.4		B	15.9		C	31.3		D
4	Santa Maria Wy/Connector/US-101 NB Ramps	Unsignalized*	8.7		A	8.8		A	10.6		B	8.6		A	8.8		A	8.6		A
5	Elks Access/Rodeo Dr	Unsignalized**	8.3		A	8.4		A	49.5		E	8.4		A	8.4		A	110.3		F
6	Union Valley Pkwy/US-101 NB Ramps	Unsignalized*			A			A			A	10.4		B	9.5		A	8.5		A
7	Union Valley Pkwy/US-101 SB Ramps	Unsignalized*	12.6		B	16.5		C	10.4		B	12.8		B	17.0		C	12.1		B
8	Union Valley Pkwy/Bradley Rd	Signalized		0.40	A		0.54	A		0.30	A		0.40	A		0.54	A		0.32	A
9	Union Valley Pkwy/Rodeo Dr	Unsignalized**			A			A			A	8.6		A	8.6		A	9.6		A

*Caltrans Intersection

**TWSC (delay shows highest lane delay)

Highlighted cells indicate LOS E or F OR indicate significant impact

		Increase in Delay (Caltrans E or F only)			Increase in V/C			Significant Impact?		
		AM	PM	Sat	AM	PM	Sat	AM	PM	Sat
1	Santa Maria Wy/College Dr/Bradley Rd				0.00	0.00	-0.07	NO	NO	NO
2	Santa Maria Wy/US-101 SB Ramps	N/A	N/A	-275.1				NO	NO	NO
3	Santa Maria Wy/US-101 NB Ramps	N/A	N/A	-155.2				NO	NO	NO
4	Santa Maria Wy/Connector/US-101 NB Ramps	N/A	N/A	N/A				NO	NO	NO
5	Elks Access/Rodeo Dr	N/A	N/A	60.8				N/A	N/A	YES
6	Union Valley Pkwy/US-101 NB Ramps	N/A	N/A	N/A				NO	NO	NO
7	Union Valley Pkwy/US-101 SB Ramps	N/A	N/A	N/A				NO	NO	NO
8	Union Valley Pkwy/Bradley Rd				0.00	0.00	0.01	NO	NO	NO
9	Union Valley Pkwy/Bradley Rd	N/A	N/A	N/A				N/A	N/A	N/A

Table 10. Existing + Cumulative + Project Caltrans Mainline Segment Analysis (2025)

2025		AM		PM		Event	
		Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS
No Build	Northbound, S of UVP	17.5	B	21.6	C	9.4	A
	Southbound, S of UVP	16.8	B	21.9	C	9.3	A
	Northbound, UVP to SMW	25.0	C	32.7	D	13.0	B
	Southbound, UVP to SMW	21.3	C	28.6	D	11.8	B
	Northbound, N of SMW	16.4	B	19.8	C	5.8	A
	Southbound, N of SMW	25.0	C	32.3	D	8.8	A
With Proposed Project	Northbound, S of UVP	17.5	B	21.6	C	9.4	A
	Southbound, S of UVP	16.7	B	21.8	C	7.3	A
	Northbound, UVP to SMW	25.0	C	32.7	D	14.6	B
	Southbound, UVP to SMW	21.2	C	28.5	D	9.7	A
	Northbound, N of SMW	16.4	B	19.9	C	6.9	A
	Southbound, N of SMW	25.0	C	32.3	D	8.8	A

The operational analysis for the Caltrans ramps is shown in Table 11 and the HCS reports are included in Appendix J. All ramps are expected to operate at LOS D or better under cumulative conditions with the project; therefore, there are no significant impacts due to the project.

Table 11. Existing + Cumulative + Project Caltrans Ramp Analysis (2025)

			SB Off-Ramp		SB On-Ramp		NB Off-Ramp		NB On-Ramp	
			Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS
Santa Maria Wy	2025 - No Build	AM	17.7	B	26.6	C	23.2	C	18.3	B
		PM	23.6	C	33.6	D	29.2	D	22.4	C
		Sat Event	0.4	A	12.2	B	10.3	B	9.5	A
	2025 + Project	AM	17.7	B	26.6	C	23.1	C	18.3	B
		PM	23.6	C	33.5	D	29.2	D	22.4	C
		Sat Event	0.4	A	10.3	B	12.0	B	10.4	B
Union Valley Pkwy	2025 - No Build	AM	18.2	B	19.0	B	11.3	B	22.7	C
		PM	25.1	C	24.9	C	15.8	B	25.1	C
		Sat Event	7.8	A	8.8	A	2.5	A	9.2	A
	2025 + Project	AM	18.1	B	19.0	B	11.2	B	22.7	C
		PM	25.0	C	24.8	C	15.8	B	25.1	C
		Sat Event	5.6	A	6.8	A	2.5	A	10.8	B

Lastly, the results for the operational analysis on the two arterial segments on Rodeo Drive and on UVP are shown in Table 12. Note that the daily volumes are rounded to the nearest 100 because most of the volumes are estimated.

Rodeo Drive operates at acceptable LOS with and without the project. Further, UVP operates below its design capacity and does not meet the *OCP*'s acceptable LOS C threshold. However, as shown in Table 9, all the intersections (or worst stop-controlled movements) on UVP are expected to operate at LOS C or better with or without the project during the AM peak, PM peak, and weekend during the event. There are only two minor intersections along the segment, and both include turn lanes, which indicates that through traffic along UVP will be generally unimpeded. Therefore, operations along UVP are consistent with the *OCP* standards for primary roadways and no significant impacts are identified.

Table 12. Existing + Cumulative + Project Arterial Segment Analysis (2025)

Segment		2025	2025 + Project
Rodeo Dr (35 mph)	AADT (veh/day)	1,600	1,500
	LOS	C or better (Acceptable)	C or better (Acceptable)
UVP (50 mph)	AADT (veh/day)	17,700	17,900
	LOS	E (Not Acceptable, but Consistent with *OCP*)	E (Not Acceptable, but Consistent with *OCP*)

4.4. OPERATIONAL ANALYSIS – LONG TERM (2040) CONDITIONS WITH AND WITHOUT PROJECT

As described for the previous analysis years, this study evaluated the signalized intersections using the ICU methodology and the unsignalized intersections and the Caltrans intersections using *Synchro*. Appendix E includes the ICU spreadsheets and *Synchro* reports for the long-term analysis (2040). Table 13 shows the resulting LOS for each of the study intersections under Long Term (2040) conditions and Long Term (2040) Plus Project conditions, as well as the significant impacts analysis. Psomas assumed that the intersection geometry and traffic control would be unchanged from existing conditions for most intersections, with the exception of the US-101 southbound ramps at Santa Maria Way and UVP and the US-101 northbound ramps at Santa Maria Way which would all need to be signalized in 2040 without the project.

Table 13 shows that the increase in the V/C ratio due to the project at all signalized intersections is lower than the *OCP* thresholds for significant impacts; therefore, there are no significant project impacts at the County signalized intersections and the intersection operations are considered to be consistent with the *OCP*. Further, Psomas expects the County unsignalized intersections to operate at LOS A during the weekday AM and PM peak hours based on the analysis; therefore, the County unsignalized intersections are consistent with the *OCP*. On the weekend, during large special events, Psomas expects a significant impact at the Elks Unocal Event Center access/Rodeo Drive intersection.

However, permanent improvements are not generally recommended for operational issues which occur sporadically, such as those generated by large events at the Elks Unocal Event Center. Because the intersection will serve typical peak period traffic volumes efficiently, no mitigation is recommended at this time.

Psomas expects all Caltrans intersections to operate at LOS C or better with the project during the weekday AM peak hour based on the assumptions and analysis.

Table 13. Long Term (2040) + Project Intersection Analysis

	Intersection	Intersection Control	2040 Cumulative									2040 Cumulative Plus Project								
			AM Peak Hour			PM Peak Hour			Sat. Night Peak			AM Peak Hour			PM Peak Hour			Sat. Night Peak		
			Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS
1	Santa Maria Wy/College Dr/Bradley Rd	Signalized		0.82	D		0.95	E		0.53	A		0.82	D		0.94	E		0.53	A
2	Santa Maria Wy/US-101 SB Ramps	Signalized*	20.6		C	21.4		C	68.0		E	15.7		B	17.9		B	10.8		B
3	Santa Maria Wy/US-101 NB Ramps	Signalized*	9.5		A	15.3		B	73.0		E	8.3		A	13.6		B	13.8		B
4	Santa Maria Wy/Connector/US-101 NB Ramps	Unsignalized*	9.9		A	9.7		A	13.7		B	9.5		A	9.4		A	9.3		A
5	Elks Access/Rodeo Dr	Unsignalized**	8.3		A	8.4		A	73.6		F	8.7		A	8.6		A	136.8		F
6	Union Valley Pkwy/US-101 NB Ramps	Unsignalized*			A			A			A	10.9		B	9.8		A	8.8		A
7	Union Valley Pkwy/US-101 SB Ramps	Signalized*	26.9		C	13.3		B	6.2		A	26.3		C	13.5		B	6.9		A
8	Union Valley Pkwy/Bradley Rd	Signalized		0.42	A		0.57	A		0.32	A		0.44	A		0.58	A		0.34	A
9	Union Valley Pkwy/Rodeo Dr	Unsignalized**			A			A			A	8.8		A	8.8		A	10.4		B

*Caltrans Intersection

**TWSC (delay shows highest lane delay)

Highlighted cells indicate LOS E or F OR indicate significant impact

		Increase in Delay (Caltrans E or F only)			Increase in V/C			Significant Impact?		
		AM	PM	Sat	AM	PM	Sat	AM	PM	Sat
1	Santa Maria Wy/College Dr/Bradley Rd				-0.01	-0.01	0.00	NO	NO	NO
2	Santa Maria Wy/US-101 SB Ramps	N/A	N/A	-57.2				NO	NO	NO
3	Santa Maria Wy/US-101 NB Ramps	N/A	N/A	-59.2				NO	NO	NO
4	Santa Maria Wy/Connector/US-101 NB Ramps	N/A	N/A	N/A				NO	NO	NO
5	Elks Access/Rodeo Dr	N/A	N/A	63.2				N/A	N/A	YES
6	Union Valley Pkwy/US-101 NB Ramps	N/A	N/A	N/A				NO	NO	NO
7	Union Valley Pkwy/US-101 SB Ramps	N/A	N/A	N/A				NO	NO	NO
8	Union Valley Pkwy/Bradley Rd				0.01	0.00	0.02	NO	NO	NO
9	Union Valley Pkwy/Bradley Rd	N/A	N/A	N/A				N/A	N/A	N/A

In addition to the study intersections, this study evaluated the three Caltrans study segments on US-101 for long-term (2040) conditions with and without the project, as shown in Table 14 and the HCS reports are included in Appendix H. As shown, Psomas expects the US-101 northbound segment between UVP and Santa Maria Way and the US-101 southbound segment north of Santa Maria Way to operate at LOS E with and without the project. Because the segments should operate at LOS E without the project, and because the project results in a density reduction, there are no significant impacts due to the project.

Table 14. Long Term (2040) + Project Caltrans Mainline Segment Analysis

2040		AM		PM		Event	
		Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS
No Build	Northbound, S of UVP	19.3	C	23.6	C	10.7	A
	Southbound, S of UVP	17.3	B	22.5	C	9.8	A
	Northbound, UVP to SMW	28.0	D	36.9	E	14.5	B
	Southbound, UVP to SMW	22.2	C	30.2	D	12.6	B
	Northbound, N of SMW	17.7	B	21.0	C	6.4	A
	Southbound, N of SMW	26.8	D	37.0	E	9.9	A
With Proposed Project	Northbound, S of UVP	19.2	C	23.5	C	10.6	A
	Southbound, S of UVP	17.1	B	22.2	C	7.2	A
	Northbound, UVP to SMW	27.8	D	36.7	E	16.1	B
	Southbound, UVP to SMW	22.0	C	29.8	D	10.1	A
	Northbound, N of SMW	17.7	B	21.0	C	7.9	A
	Southbound, N of SMW	26.8	D	37.0	E	9.9	A

Table 15 and Appendix K, respectively, show the operational analysis for the Caltrans ramps and the HCS reports. Based on the results, Psomas expects the southbound on-ramp at the Santa Maria Way Traffic Interchange (TI) to operate at LOS F without the project and at LOS E with the project. Therefore, because the project will improve operations, there are no significant impacts due to the project.

Table 15. Long Term (2040) + Project Caltrans Ramp Analysis

			SB Off-Ramp		SB On-Ramp		NB Off-Ramp		NB On-Ramp	
			Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS
Santa Maria Wy	2040 - No Build	AM	19.4	B	28.5	D	25.8	C	20.9	C
		PM	25.3	C	35.6	F	31.7	D	24.9	C
		Sat Event	1.5	A	13.6	B	11.9	B	11.1	B
	2040 + Project	AM	19.4	B	28.3	D	25.6	C	20.8	C
		PM	25.3	C	35.4	E	31.6	D	24.8	C
		Sat Event	1.5	A	11.3	B	13.7	B	12.1	B
Union Valley Pkwy	2040 - No Build	AM	19.2	B	20.0	C	13.2	B	25.1	C
		PM	26.3	C	26.0	C	17.8	B	27.4	C
		Sat Event	8.7	A	9.6	A	3.9	A	10.7	B
	2040 + Project	AM	19.0	B	19.8	B	13.1	B	25.0	C
		PM	26.0	C	25.8	C	17.7	B	27.4	C
		Sat Event	6.0	A	7.1	A	3.8	A	12.6	B

Lastly, Table 16 shows the results for the operational analysis on the two arterial segments on Rodeo Drive and on UVP. Analysts rounded the daily volumes to the nearest 100 because they estimated most of the volumes. As shown in Table 16, Psomas expects the segment on Rodeo Drive to operate at acceptable LOS (LOS C or better) with the project; therefore, there are no significant impacts due to the project on Rodeo Drive.

Psomas expects the UVP segment to operate above design capacity. As was the case for 2025 conditions, analysts expect all the intersections (or worst stop-controlled movements) on UVP to operate at LOS C or better with or without the project during the AM peak, PM peak, and weekend during the event. The only two minor intersections along the segment both include turn lanes, which indicates that through traffic along UVP will be generally unimpeded. Therefore, the segment would operate at satisfactory conditions under existing plus cumulative conditions with and without the project and the UVP segment is consistent with the *OCP*. As a result, no significant impacts are identified for UVP.

Table 16. Long Term (2040) + Project Arterial Segment Analysis

Segment		2040	2040 + Project
Rodeo Dr (35 mph)	**AADT (veh/day)**	6,400	5,700
	LOS	C or better (Acceptable)	C or better (Acceptable)
UVP (50 mph)	**AADT (veh/day)**	19,100	19,800
	LOS	Above Design Capacity (but Consistent with *OCP*)	Above Design Capacity (but Consistent with *OCP*)

4.5. FAIR SHARE CONTRIBUTION - PROJECT

Although the project is not expected to have a significant impact at any of the study intersections, the potential for a fair share contribution towards any improvements was determined as shown in Table 17. A fair share contribution is generally required when any increase in delays or ICU from existing conditions to future conditions with the project meets significant impact thresholds.

As seen in Table 17, a fair share contribution may be needed for the intersections of Santa Maria Way/College Drive/Bradley Drive and Elks Unocal Event Center Access/Rodeo Drive. However, Psomas found that with the project, traffic volumes are expected to be lower at the Santa Maria Way/College Drive/Bradley Drive intersection. Therefore, the project will not have any fair share contribution to improvements at that intersection.

Volumes at the Elks Unocal Event Center Access and Rodeo Drive intersection show that for weekday conditions, the project will be responsible for nearly 100% of the volume increase at the intersection. For the Saturday peak hour, the project will only redistribute the traffic volumes, but will not change the total volumes at the intersection. As shown in Table 17, the fair share for the Elks Unocal Event Center Access/Rodeo Drive intersection is only based on the Saturday peak hour. As previously noted, permanent improvements are not generally recommended for operational issues which occur sporadically, such as those generated by large events at the Elks Unocal Event Center, so the project is not required to contribute to any improvements at the intersection.

Table 17. Fair Share Contribution: Project

	Intersection	Intersection Control	Existing									2040 Cumulative Plus Project								
			AM Peak Hour			PM Peak Hour			Sat. Night Peak			AM Peak Hour			PM Peak Hour			Sat. Night Peak		
			Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS
1	Santa Maria Wy/College Dr/Bradley Rd	Signalized		0.66	B		0.74	C		0.43	A		0.82	D		0.94	E		0.53	A
2	Santa Maria Wy/US-101 SB Ramps	Unsignalized*	15.6		C	14.7		B	105.3		F	15.7		B	17.9		B	10.8		B
3	Santa Maria Wy/US-101 NB Ramps	Unsignalized*	9.5		A	11.2		B	57.7		F	8.3		A	13.6		B	13.8		B
4	Santa Maria Wy/Connector/US-101 NB Ramps	Unsignalized*	8.5		A	9.0		A	10.4		B	9.5		A	9.4		A	9.3		A
5	Elks Access/Rodeo Dr	Unsignalized**	8.3		A	8.4		A	42.1		E	8.7		A	8.6		A	136.8		F
6	Union Valley Pkwy/US-101 NB Ramps	Unsignalized*			A			A			A	10.9		B	9.8		A	8.8		A
7	Union Valley Pkwy/US-101 SB Ramps	Unsignalized*	11.6		B	13.8		B	10.1		B	26.3		C	13.5		B	6.9		A
8	Union Valley Pkwy/Bradley Rd	Signalized		0.39	A		0.51	A		0.30	A		0.44	A		0.58	A		0.34	A
9	Union Valley Pkwy/Bradley Rd	Unsignalized**			A			A			A	8.8		A	8.8		A	10.4		B

*Caltrans Intersection

**TWSC (delay shows highest lane delay)

Highlighted cells indicate LOS E or F OR indicate significant impact

		Increase in Delay (Caltrans E or F only)			Increase in V/C			Fair Share?		
		AM	PM	Sat	AM	PM	Sat	AM	PM	Sat
1	Santa Maria Wy/College Dr/Bradley Rd				0.15	0.21	0.10	NO	YES	NO
2	Santa Maria Wy/US-101 SB Ramps	N/A	N/A	-94.5				NO	NO	NO
3	Santa Maria Wy/US-101 NB Ramps	N/A	N/A	-43.9				NO	NO	NO
4	Santa Maria Wy/Connector/US-101 NB Ramps	N/A	N/A	N/A				NO	NO	NO
5	Elks Access/Rodeo Dr	N/A	N/A	94.7				N/A	N/A	YES
6	Union Valley Pkwy/US-101 NB Ramps	N/A	N/A	N/A				NO	NO	NO
7	Union Valley Pkwy/US-101 SB Ramps	N/A	-0.3	N/A				NO	NO	NO
8	Union Valley Pkwy/Bradley Rd				0.05	0.07	0.04	NO	NO	NO
9	Union Valley Pkwy/Bradley Rd	N/A	N/A	N/A				N/A	N/A	N/A

5. OPERATIONAL ANALYSIS – SANTA MARIA WAY INTERCHANGE MODIFICATION

5.1. SANTA MARIA WAY INTERCHANGE MODIFICATION TRAFFIC VOLUME PROJECTIONS

5.1.1. Trip Distribution

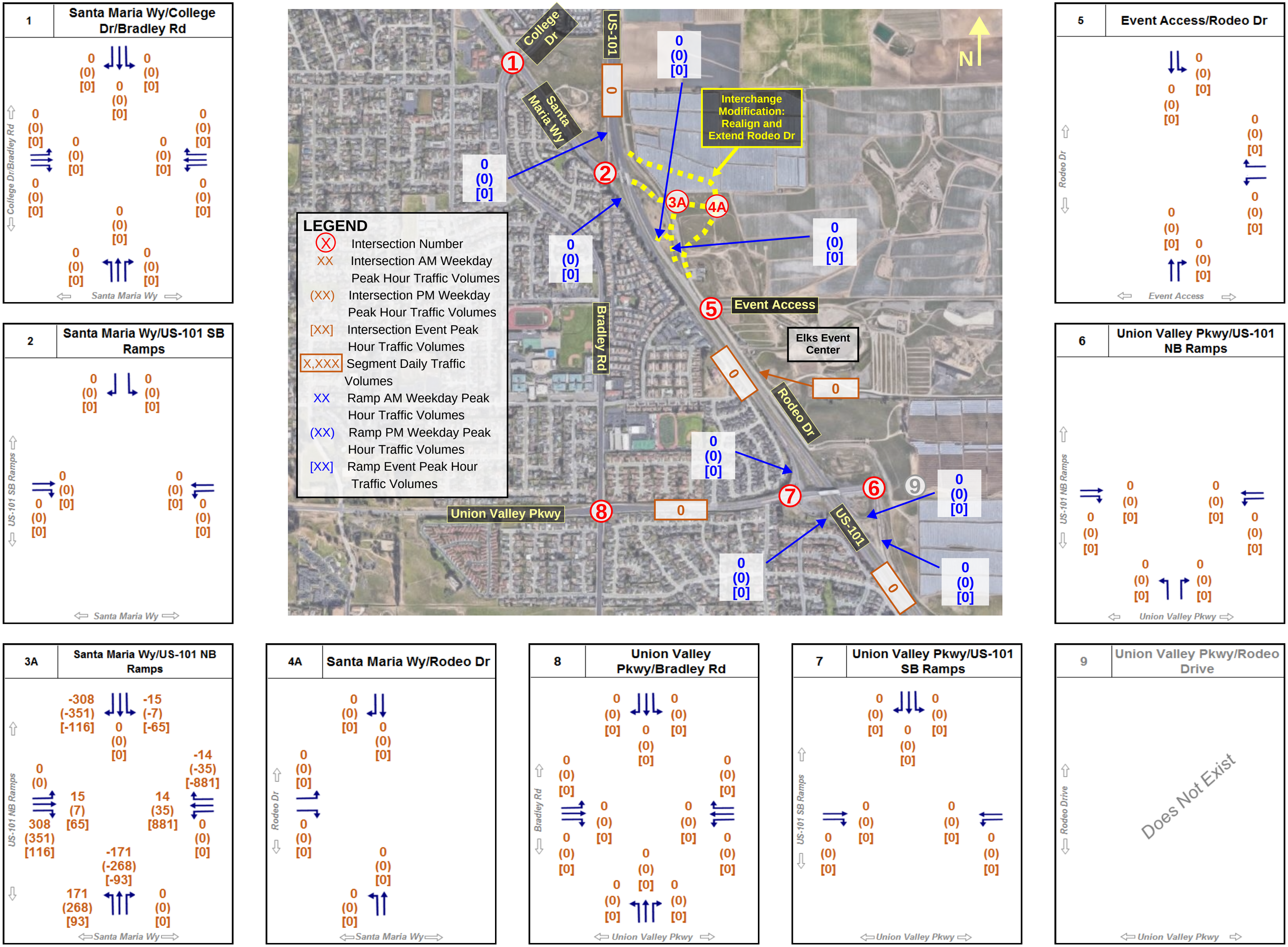
The Santa Maria Way Interchange Modification does not modify the existing roadway network or intersection configuration other than the area of the US-101 northbound ramps near Rodeo Drive. Therefore, the project traffic volumes are assumed to be the same as existing conditions (refer to Figure 4).

5.1.2. Traffic Volumes

Traffic volumes at all ramps and roadway segments are expected to be the same as for existing conditions. Figures 16, 17, and 18 show the Santa Maria Way Interchange Modification traffic volumes for the existing analysis year (2019), the opening year analysis year (2025), and the long-term analysis year (2040), respectively. Note that the only changes are in the direction of movements at the US-101 northbound ramps, as listed below:

- Northbound throughs become northbound left turns
- Southbound left turns become eastbound right turns
- Southbound right turns become eastbound throughs
- Westbound right turns become westbound throughs

The total estimated traffic volumes with the Santa Maria Interchange Modification for the existing analysis year (2019), the opening year analysis year (2025), and the long term analysis year (2040) are shown in Figures 19, 20, and 21, respectively. The volumes were calculated by adding the future no build volumes (Figures 7, 8, and 9) and the Santa Maria Interchange Modification volumes (Figures 16, 17, and 18).

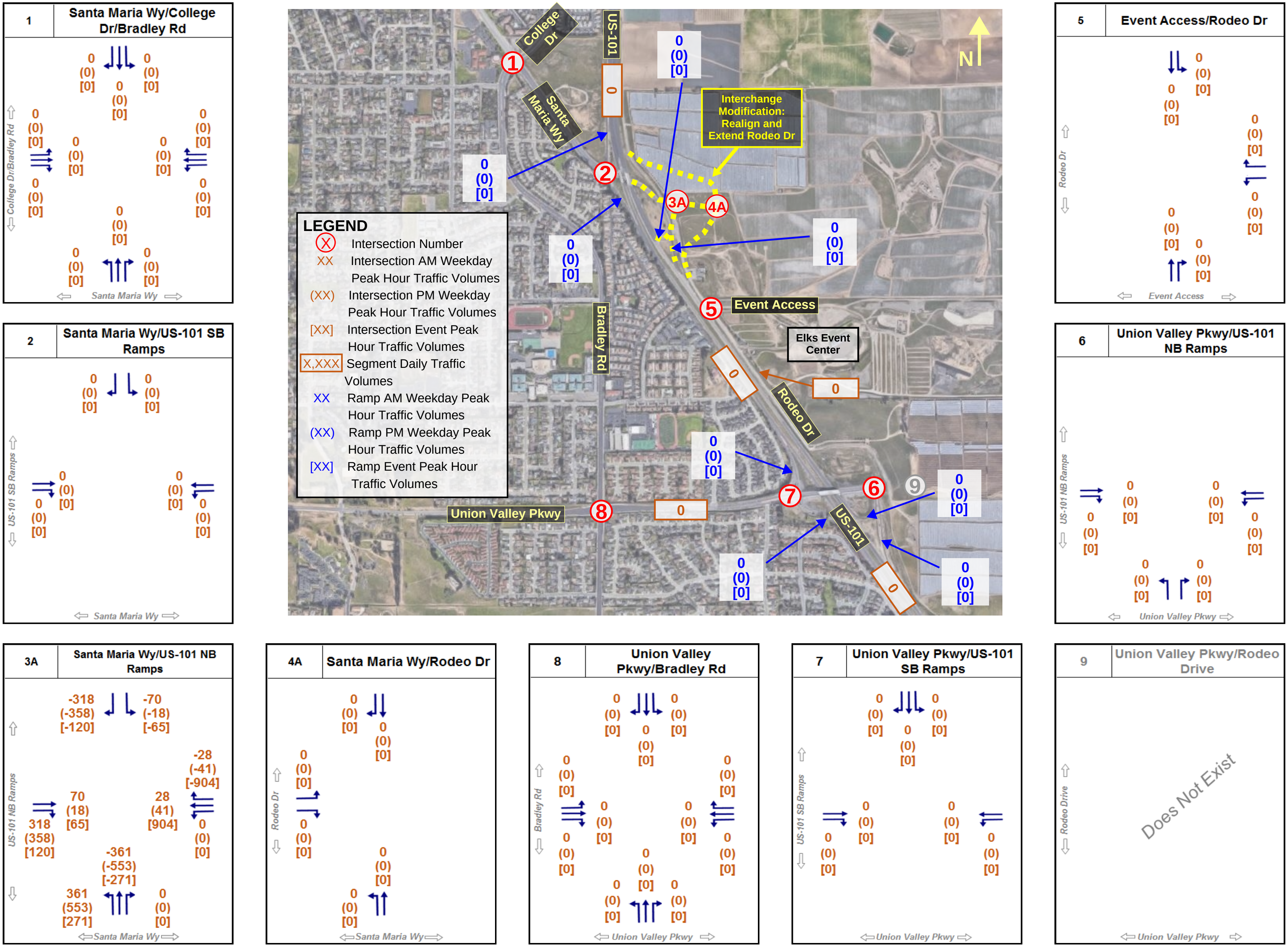


Orcutt Community Plan Amendment Traffic Study

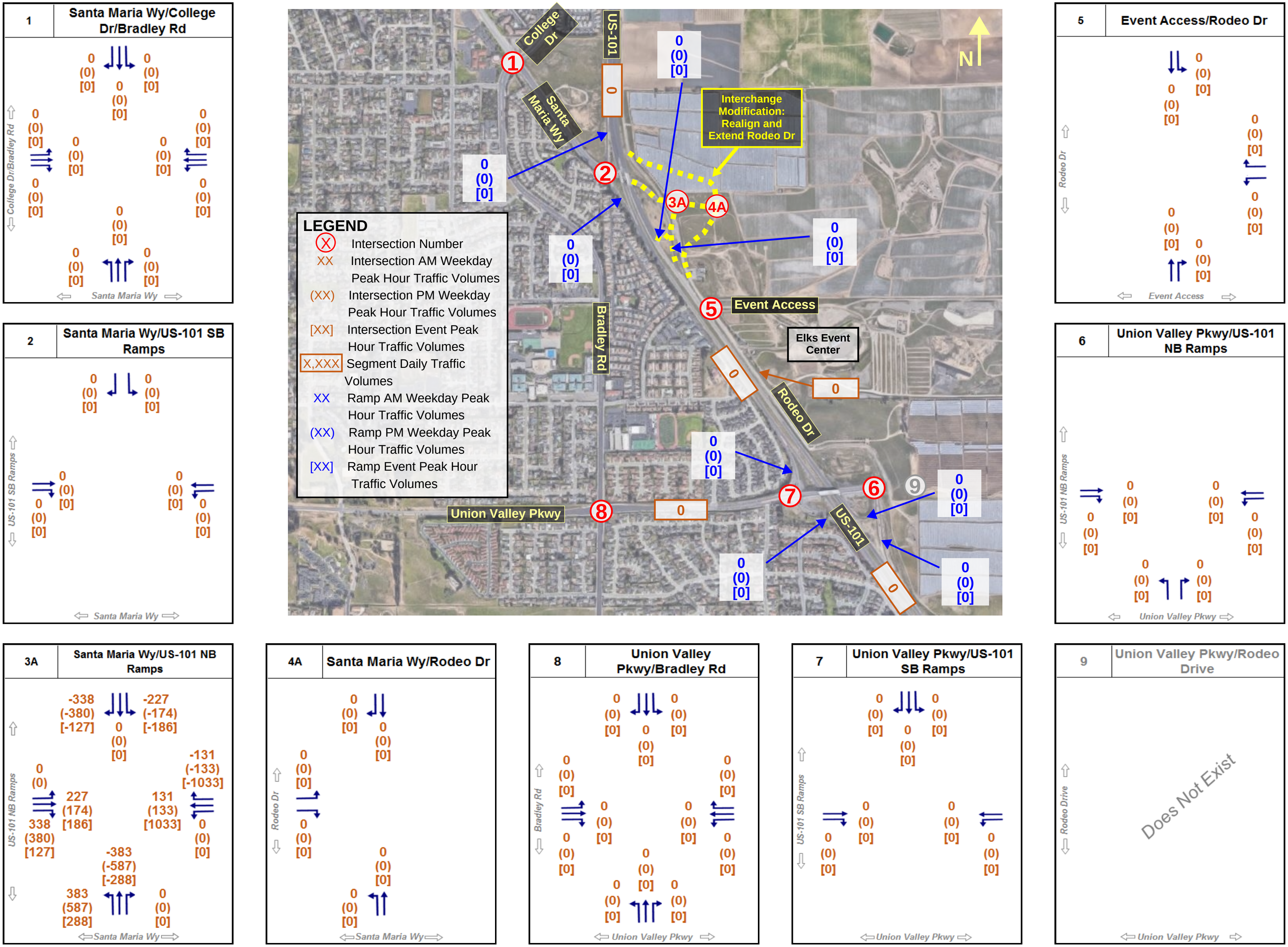
Figure 16. Santa Maria Way Interchange Modification Traffic Volumes - 2019

PSOMAS

May 2020



1 Santa Maria Wy/College Dr/Bradley Rd
College Dr/Bradley Rd
Santa Maria Wy
2 Santa Maria Wy/US-101 SB Ramps
US-101 SB Ramps
Santa Maria Wy
3A Santa Maria Wy/US-101 NB Ramps
-318 (-358) [-120]
-70 (-18) [-65]
-28 (-41) [-904]
70 (18) [65]
28 (41) [904]
318 (358) [120]
-361 (-553) [-271]
361 (553) [271]
US-101 NB Ramps
Santa Maria Wy
4A Santa Maria Wy/Rodeo Dr
Rodeo Dr
Santa Maria Wy
5 Event Access/Rodeo Dr
Rodeo Dr
Event Access
6 Union Valley Pkwy/US-101 NB Ramps
US-101 NB Ramps
Union Valley Pkwy
7 Union Valley Pkwy/US-101 SB Ramps
US-101 SB Ramps
Union Valley Pkwy
8 Union Valley Pkwy/Bradley Rd
Bradley Rd
Union Valley Pkwy
9 Union Valley Pkwy/Rodeo Drive
Does Not Exist
Rodeo Drive
Union Valley Pkwy
College Dr
US-101
Santa Maria Wy
Interchange Modification: Realign and Extend Rodeo Dr
Event Access
Elks Event Center
Bradley Rd
Rodeo Dr
Union Valley Pkwy
N
LEGEND
Intersection Number
XX Intersection AM Weekday Peak Hour Traffic Volumes
(XX) Intersection PM Weekday Peak Hour Traffic Volumes
[XX] Intersection Event Peak Hour Traffic Volumes
X,XXX Segment Daily Traffic Volumes
XX Ramp AM Weekday Peak Hour Traffic Volumes
(XX) Ramp PM Weekday Peak Hour Traffic Volumes
[XX] Ramp Event Peak Hour Traffic Volumes

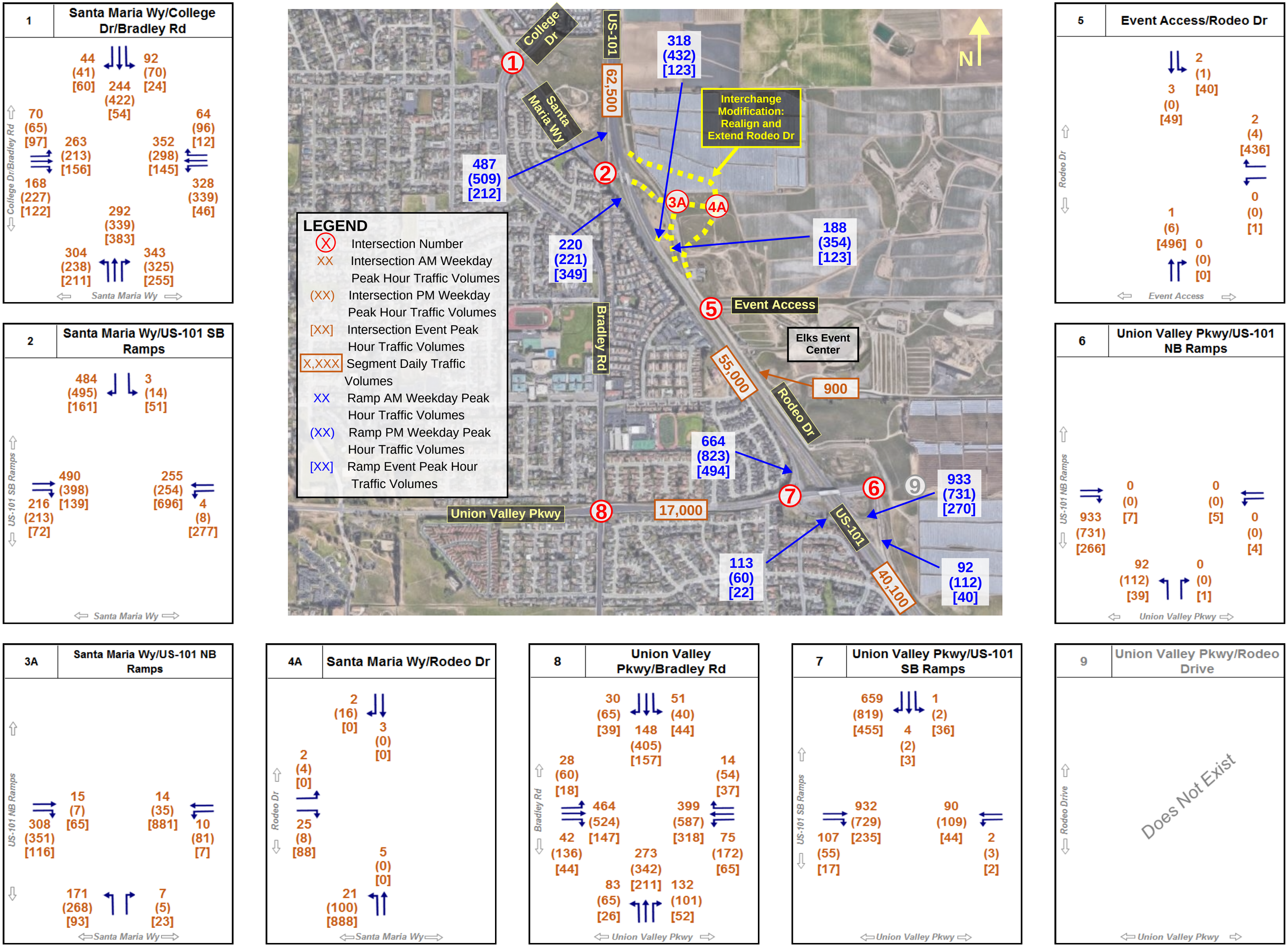


Orcutt Community Plan Amendment Traffic Study

Figure 18. Santa Maria Way Interchange Modification Traffic Volumes - 2040

PSOMAS

May 2020

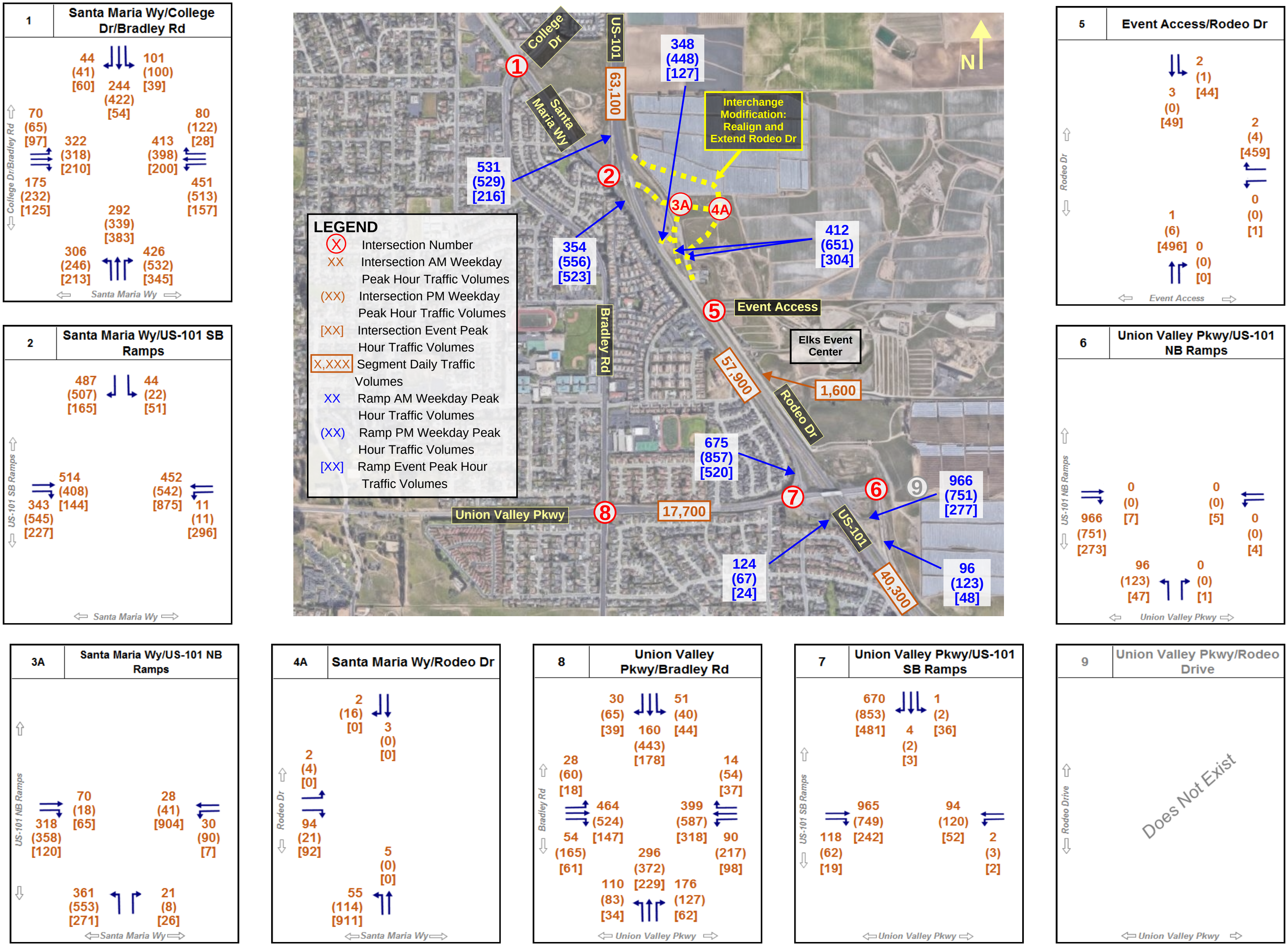


Orcutt Community Plan Amendment Traffic Study

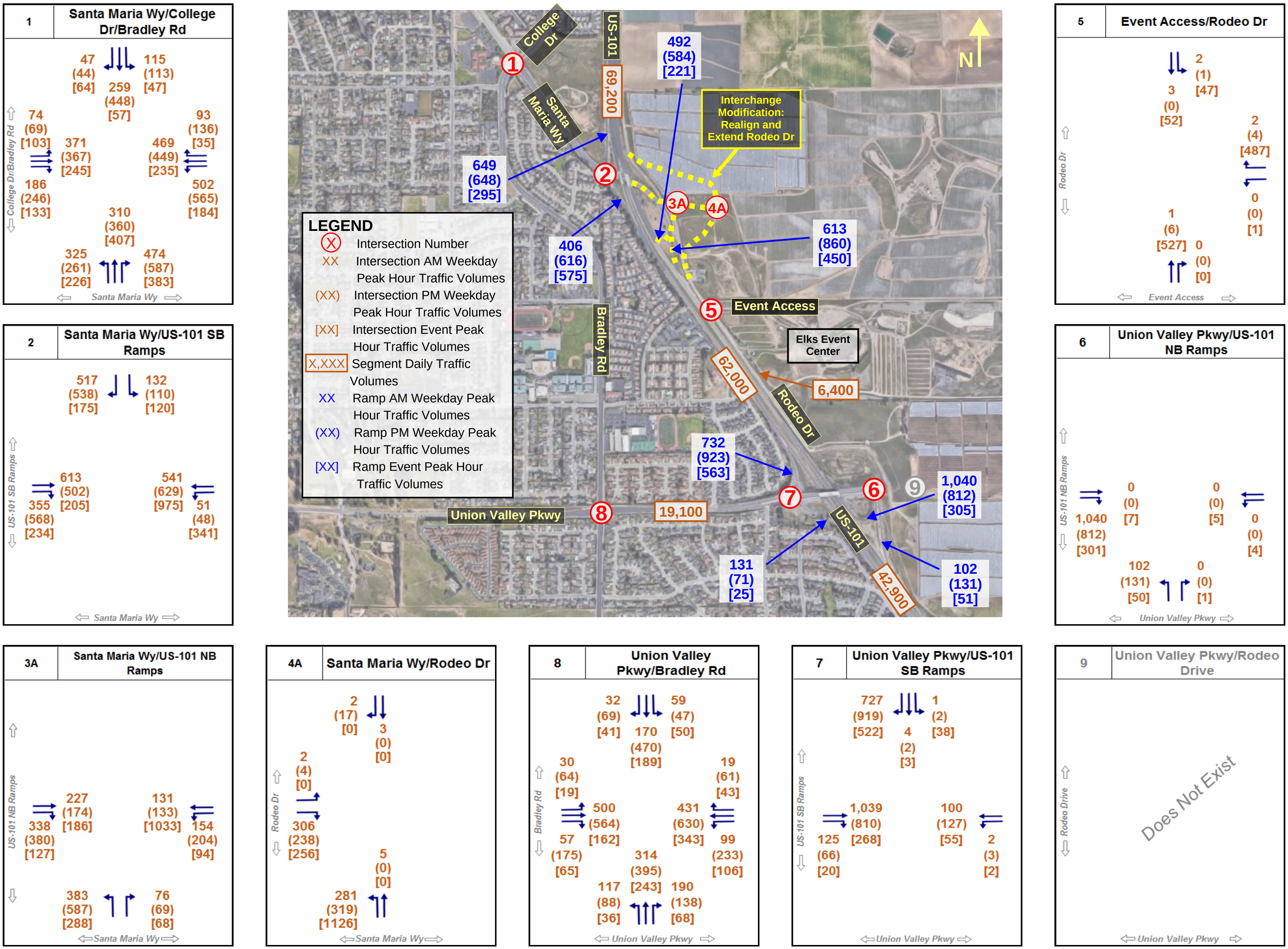
Figure 19. Existing + Santa Maria Way Interchange Modification Traffic Volumes

PSOMAS

May 2020



Orcutt Community Plan Amendment Traffic Study	*Figure 20. Existing + Opening Year (2025) Cumulative + Santa Maria Way Interchange Modification Traffic Volumes*	PSOMAS	May 2020



Orcutt Community Plan Amendment Traffic Study	*Figure 21. Long Term (2040) + Santa Maria Way Interchange Modification Traffic Volumes*	PSOMAS	May 2020

5.2. OPERATIONAL ANALYSIS – EXISTING CONDITIONS WITH AND WITHOUT SANTA MARIA WAY INTERCHANGE MODIFICATION

As previously discussed, this study evaluated the signalized intersections using the ICU methodology; the unsignalized intersections and the Caltrans intersections were evaluated using *Synchro*. For existing conditions and existing plus Santa Maria Way Interchange Modification conditions, the ICU spreadsheets and *Synchro* reports are included in Appendix C. The findings are summarized below.

The purpose of the Existing Plus Santa Maria Way Interchange Modification analysis is to provide the baseline for assessing environmental impacts, which is generally the existing conditions at the time that the environmental document for the project is prepared. The analysis assesses the transportation and circulation impacts of the proposed project against existing traffic conditions, irrespective of the proposed project's horizon year.

Table 18 shows the resulting LOS for each of the study intersections under Existing conditions and Existing Plus Santa Maria Way Interchange Modification conditions, as well as the significant impact analysis. As seen in Table 18, all the intersections (or worst stop-controlled movements) are expected to operate at LOS C or better with or without the project during weekday AM and PM peak hours. On the weekend, the Santa Maria Way/US-101 SB Ramps intersection and the Elks Unocal Event Center Access/Rodeo Drive intersection are expected to operate at LOS E or worse with and without Santa Maria Way Interchange Modification. Because no changes are made at these intersections when compared to existing conditions and no increase in V/C ratio or delay is expected, there are no significant impacts due to Santa Maria Way Interchange Modification.

Table 18. Existing + Santa Maria Interchange Modification Intersection Analysis

	Intersection	Intersection Control	Existing									Existing Plus Santa Maria Interchange Modification								
			AM Peak Hour			PM Peak Hour			Sat. Night Peak			AM Peak Hour			PM Peak Hour			Sat. Night Peak		
			Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS
1	Santa Maria Wy/College Dr/Bradley Rd	Signalized		0.66	B		0.74	C		0.43	A		0.66	B		0.74	C		0.43	A
2	Santa Maria Wy/US-101 SB Ramps	Unsignalized*	15.6		C	14.7		B	105.3		F	15.6		C	14.7		B	105.3		F
3	Santa Maria Wy/US-101 NB Ramps	Unsignalized*	9.5		A	11.2		B	57.7		F	5.1		A	6.5		A	15.8		C
4	Santa Maria Wy/Connector/US-101 NB Ramps	Unsignalized*	8.5		A	9.0		A	10.4		B	8.5		A	9.0		A	10.4		B
5	Elks Access/Rodeo Dr	Unsignalized**	8.3		A	8.4		A	42.1		E	8.3		A	8.4		A	42.1		E
6	Union Valley Pkwy/US-101 NB Ramps	Unsignalized*																		
7	Union Valley Pkwy/US-101 SB Ramps	Unsignalized*	11.6		B	13.8		B	10.1		B	12.4		B	15.3		C	10.2		B
8	Union Valley Pkwy/Bradley Rd	Signalized		0.39	A		0.51	A		0.30	A		0.39	A		0.51	A		0.30	A

*Caltrans Intersection

**TWSC (delay shows highest lane delay)

Highlighted cells indicate LOS E or F OR indicate significant impact

		Increase in Delay (Caltrans E or F only)			Increase in V/C			Significant Impact?		
		AM	PM	Sat	AM	PM	Sat	AM	PM	Sat
1	Santa Maria Wy/College Dr/Bradley Rd				0.00	0.00	0.00	NO	NO	NO
2	Santa Maria Wy/US-101 SB Ramps	N/A	N/A	N/A				NO	NO	NO
3	Santa Maria Wy/US-101 NB Ramps	N/A	N/A	-41.9				NO	NO	NO
4	Santa Maria Wy/Connector/US-101 NB Ramps	N/A	N/A	N/A				NO	NO	NO
5	Elks Access/Rodeo Dr	N/A	N/A	N/A				N/A	N/A	N/A
6	Union Valley Pkwy/US-101 NB Ramps	N/A	N/A	N/A				NO	NO	NO
7	Union Valley Pkwy/US-101 SB Ramps	N/A	1.5	N/A				NO	NO	NO
8	Union Valley Pkwy/Bradley Rd				0.00	0.00	0.00	NO	NO	NO

Traffic volumes on the three Caltrans study segments on US-101, on the Caltrans ramps, and on the two arterial segments on Rodeo Drive and on UVP are the same for existing conditions and for existing plus Santa Maria Way Interchange Modification conditions. Therefore, there are no significant impacts on any of these facilities. The operations for these facilities will match the existing operations shown in Section 4.

5.3. OPERATIONAL ANALYSIS – EXISTING + CUMULATIVE (2025) CONDITIONS WITH AND WITHOUT SANTA MARIA WAY INTERCHANGE MODIFICATION

As for existing conditions, this study evaluated the signalized intersections using the ICU methodology; the unsignalized intersections and the Caltrans intersections were evaluated using *Synchro*. The *ICU spreadsheets* and *Synchro* reports for the opening year of 2025 are included in Appendix D. Table 19 shows the resulting LOS for each of the study intersections under Existing Plus Cumulative (2025) conditions and Existing Plus Cumulative (2025) Plus Santa Maria Way Interchange Modification conditions, as well as the significant impacts analysis. It was assumed that the intersection geometry and traffic control would be unchanged from existing conditions.

As shown in Table 19, all the intersections (or worst stop-controlled movements) are expected to operate at LOS D or better with or without the project during weekday AM and PM peak hours. On the weekend, the Santa Maria Way/US-101 SB Ramps intersection and the Elks Unocal Event Center Access/Rodeo Drive intersection are expected to operate at LOS E or worse with and without Santa Maria Way Interchange Modification. Because no changes are made at these intersections when compared to existing plus cumulative conditions and no increase in V/C ratio or delay is expected, there are no significant impacts due to Santa Maria Way Interchange Modification.

Traffic volumes on the three Caltrans study segments on US-101, on the Caltrans ramps, and on the two arterial segments on Rodeo Drive and on UVP are the same for existing plus cumulative conditions and for existing plus cumulative plus Santa Maria Way Interchange Modification conditions. Therefore, there are no significant impacts on any of these facilities. The operations for these facilities will match the 2025 cumulative operations shown in Section 4.

Table 19. Existing + Cumulative + Santa Maria Interchange Modification Intersection Analysis (2025)

	Intersection	Intersection Control	2025 Cumulative									2025 Cumulative Plus Santa Maria Interchange Modification								
			AM Peak Hour			PM Peak Hour			Sat. Night Peak			AM Peak Hour			PM Peak Hour			Sat. Night Peak		
			Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS
1	Santa Maria Wy/College Dr/Bradley Rd	Signalized		0.77	C		0.89	D		0.50	A		0.77	C		0.89	D		0.50	A
2	Santa Maria Wy/US-101 SB Ramps	Unsignalized*	23.8		C	21.2		C	303.7		F	23.8		C	21.2		C	303.7		F
3	Santa Maria Wy/US-101 NB Ramps	Unsignalized*	11.4		B	15.9		C	186.5		F	7.7		A	10.0		A	32.0		D
4	Santa Maria Wy/Connector/US-101 NB Ramps	Unsignalized*	8.7		A	8.8		A	10.6		B	8.7		A	8.8		A	10.6		B
5	Elks Access/Rodeo Dr	Unsignalized**	8.3		A	8.4		A	49.5		E	8.3		A	8.4		A	49.5		E
6	Union Valley Pkwy/US-101 NB Ramps	Unsignalized*																		
7	Union Valley Pkwy/US-101 SB Ramps	Unsignalized*	12.6		B	16.5		C	10.4		B	12.6		B	16.5		C	10.4		B
8	Union Valley Pkwy/Bradley Rd	Signalized		0.40	A		0.54	A		0.30	A		0.40	A		0.54	A		0.30	A

*Caltrans Intersection

**TWSC (delay shows highest lane delay)

Highlighted cells indicate LOS E or F OR indicate significant impact

		Increase in Delay (Caltrans E or F only)			Increase in V/C			Significant Impact?		
		AM	PM	Sat	AM	PM	Sat	AM	PM	Sat
1	Santa Maria Wy/College Dr/Bradley Rd				0.00	0.00	0.00	NO	NO	NO
2	Santa Maria Wy/US-101 SB Ramps	N/A	N/A	N/A				NO	NO	NO
3	Santa Maria Wy/US-101 NB Ramps	N/A	N/A	-154.5				NO	NO	NO
4	Santa Maria Wy/Connector/US-101 NB Ramps	N/A	N/A	N/A				NO	NO	NO
5	Elks Access/Rodeo Dr	N/A	N/A	N/A				N/A	N/A	N/A
6	Union Valley Pkwy/US-101 NB Ramps	N/A	N/A	N/A				NO	NO	NO
7	Union Valley Pkwy/US-101 SB Ramps	N/A	N/A	N/A				NO	NO	NO
8	Union Valley Pkwy/Bradley Rd				0.00	0.00	0.00	NO	NO	NO

5.4. OPERATIONAL ANALYSIS – LONG TERM (2040) CONDITIONS WITH AND WITHOUT SANTA MARIA WAY INTERCHANGE MODIFICATION

The ICU spreadsheets and *Synchro* reports for the long-term analysis (2040) are included in Appendix E. Table 20 shows the resulting LOS for each of the study intersections under Long Term (2040) conditions and Long Term (2040) Plus Santa Maria Way Interchange Modification conditions, as well as the significant impacts analysis. It was assumed that the intersection geometry and traffic control would be unchanged from existing conditions for most intersections, except for the southbound US-101 ramps at Santa Maria Way and UVP and the northbound US-101 ramps at Santa Maria that will all need to be signalized in 2040.

Table 20 shows that all the intersections (or worst stop-controlled movements) are expected to operate at LOS D or better with or without Santa Maria Way Interchange Modification during the weekday AM peak hour. In the PM peak hour, the Santa Maria Way/College Drive/Bradley Road intersection is expected to operate at LOS E with and without Santa Maria Way Interchange Modification. Because no changes will be made at the intersection and no increase in delay is expected, there are no significant impacts due to Santa Maria Way Interchange Modification at the Santa Maria Way/College Drive/Bradley Road intersection.

On the weekend, the Santa Maria Way/US-101 SB Ramps intersection and the Elks Unocal Event Center Access/Rodeo Drive intersection are expected to operate at LOS E or F with and without Santa Maria Way Interchange Modification. Because no changes are made at these intersections when compared to long-term (2040) conditions and no increase in V/C ratio or delay is expected, there are no significant impacts due to Santa Maria Way Interchange Modification.

Traffic volumes on the three Caltrans study segments on US-101, on the Caltrans ramps, and on the two arterial segments on Rodeo Drive and on UVP are the same for long term (2040) conditions with and without Santa Maria Way Interchange Modification. Therefore, there are no significant impacts on any of these facilities. The operations for these facilities will match the 2040 long-term cumulative operations shown in Section 4.

Table 20. Long Term (2040) + Santa Maria Interchange Modification Intersection Analysis

	Intersection	Intersection Control	2040 Cumulative									2040 Cumulative Plus Santa Maria Interchange Modification								
			AM Peak Hour			PM Peak Hour			Sat. Night Peak			AM Peak Hour			PM Peak Hour			Sat. Night Peak		
			Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS	Delay	V/C	LOS
1	Santa Maria Wy/College Dr/Bradley Rd	Signalized		0.82	D		0.95	E		0.53	A		0.82	D		0.95	E		0.53	A
2	Santa Maria Wy/US-101 SB Ramps	Unsignalized*	20.6		C	21.4		C	68.0		E	20.6		C	22.5		C	68.0		E
3	Santa Maria Wy/US-101 NB Ramps	Unsignalized*	9.5		A	15.3		B	73.0		E	11.2		B	15.7		B	32.1		C
4	Santa Maria Wy/Connector/US-101 NB Ramps	Unsignalized*	9.9		A	9.7		A	13.7		B	9.9		A	9.7		A	13.7		B
5	Elks Access/Rodeo Dr	Unsignalized**	8.3		A	8.4		A	73.6		F	8.3		A	8.4		A	73.6		F
6	Union Valley Pkwy/US-101 NB Ramps	Unsignalized*																		
7	Union Valley Pkwy/US-101 SB Ramps	Unsignalized*	26.9		C	13.3		B	6.2		A	26.9		C	12.5		B	6.1		A
8	Union Valley Pkwy/Bradley Rd	Signalized		0.42	A		0.57	A		0.32	A		0.42	A		0.57	A		0.32	A

*Caltrans Intersection

**TWSC (delay shows highest lane delay)

Highlighted cells indicate LOS E or F OR indicate significant impact

		Increase in Delay (Caltrans E or F only)			Increase in V/C			Significant Impact?		
		AM	PM	Sat	AM	PM	Sat	AM	PM	Sat
1	Santa Maria Wy/College Dr/Bradley Rd				0.00	0.00	0.00	NO	NO	NO
2	Santa Maria Wy/US-101 SB Ramps	N/A	N/A	0.0				NO	NO	NO
3	Santa Maria Wy/US-101 NB Ramps	N/A	N/A	-40.9				NO	NO	NO
4	Santa Maria Wy/Connector/US-101 NB Ramps	N/A	N/A	N/A				NO	NO	NO
5	Elks Access/Rodeo Dr	N/A	N/A	N/A				N/A	N/A	N/A
6	Union Valley Pkwy/US-101 NB Ramps	N/A	N/A	N/A				NO	NO	NO
7	Union Valley Pkwy/US-101 SB Ramps	N/A	N/A	N/A				NO	NO	NO
8	Union Valley Pkwy/Bradley Rd				0.00	0.00	0.00	NO	NO	NO

5.5. FAIR SHARE CONTRIBUTION – SANTA MARIA WAY INTERCHANGE MODIFICATION

The project is not expected to change traffic volumes at any of the study intersections. Therefore, no fair share contribution is required.

5.6. OTHER CONSIDERATIONS – SANTA MARIA WAY INTERCHANGE MODIFICATION

Regarding the Santa Maria Way Interchange Modification, a few considerations need to be addressed regarding three elements listed below:

a) Lack of a redundant point of access and alternative emergency vehicle route: the Santa Maria Way Interchange modification will not provide a second point of access to the Elks Unocal Event Center. In addition to the impact to traffic operations and circulation, the lack of a second point of access will also increase emergency response times, as no alternative emergency routes will be available. The proposed improvements to the UVP interchange will provide a redundant point of access to the Elks Unocal Event Center.
b) Traffic hazard during construction: modifications to the Santa Maria Interchange would need to be done under traffic due to lack of alternative routes, creating potential hazards for users and construction workers. Improvements to the UVP would be done without any traffic, avoiding any construction safety impacts.
c) Sight distance: all improvements will comply with design standards for sight distance.

6. VEHICLE MILES TRAVELED

6.1. BACKGROUND

Signed by Governor Brown in 2013, Senate Bill (SB) 743 changes how public agencies analyze transportation impacts under CEQA (codified in the California Public Resources Code (PRC), Division 12, Chapter 2.7, Section 21099). A primary goal is to shift the focus from automobile delay and traffic congestion to automobile travel, fuel consumption, and emissions, which, in turn, will help reduce greenhouse gas emissions and combat climate change. In part, SB 743 directs the Governor's Office of Planning and Research (OPR) to develop and transmit to the California Natural Resources Agency proposed revisions to the CEQA Guidelines that establish new criteria for determining the significance of transportation impacts [PRC 21099(b)(1)].

In 2014 and 2016, respectively, OPR proposed preliminary and revised revisions to the CEQA Guidelines. The proposed revisions included new methods of measuring transportation impacts. The CEQA Guidelines in effect at that time treated automobile delay and congestion, commonly measured using LOS, as transportation impacts. In contrast, OPR concluded that shifting to vehicle miles traveled (VMT) would more effectively achieve SB 743's goals to reduce greenhouse gas emissions and promote multimodal transportation and diverse land uses that help reduce automobile travel.

On December 28, 2018, the California Natural Resources Agency certified and adopted proposed revisions to the CEQA Guidelines (codified in the California Code of Regulations (CCR), Title 14, Division 6, Chapter 3, Section 15000 et seq.). The revisions include new criteria for determining the significance of a project's transportation impacts. Specifically, CEQA Guidelines Section 15064.3(a) states, "vehicle miles traveled is the most appropriate measure of transportation impacts." With this change, the County may no longer use automobile delay, as measured by LOS or similar measures of vehicular capacity or traffic congestion, as the basis for determining significance of transportation impacts under CEQA.

6.2. TIMING AND APPLICABILITY

SB 743 and the revisions to the CEQA Guidelines specify when these changes take effect. PRC 21099(b)(2) states, “Upon certification of the guidelines by the Secretary of the Natural Resources Agency … automobile delay … or similar measures of vehicular capacity or traffic congestion shall not be considered a significant impact on the environment.” CEQA Guidelines Section 15064.3(c) states, “A lead agency may elect to be governed by the provisions of this section immediately. Beginning on July 1, 2020, the provisions of this section shall apply statewide.”

The County is currently updating Chapter 19, Thresholds of Significance for Transportation Impacts, of the County’s Environmental Thresholds and Guidelines Manual (County Environmental Thresholds) (County of Santa Barbara 2018) to shift from LOS to VMT-based metrics pursuant to CEQA Guidelines Section 15064.3. The current County Environmental Thresholds contain thresholds of significance for traffic impacts that focus on LOS and other similar metrics related to automobile delay. The update will include new methodologies and thresholds of significance. The County expects to adopt the update in fall 2020.

In the interim, the County recommends that environmental documents sent out for public review before July 1, 2020, use VMT-based metrics to analyze the significance of a project’s transportation impacts. However, the County currently has no model or methods to estimate or determine the significance of VMT-related transportation impacts. Until the County adopts new methodologies and thresholds of significance, environmental documents that elect to comply with CEQA Guidelines Section 15064.3 should analyze a project’s VMT qualitatively per CEQA Guidelines Section 15064.3(b)(3). Therefore, this TIS qualitatively evaluates whether the project may cause a measurable and substantial increase in VMT and, therefore, warrant an analysis of induced vehicle travel. The following section evaluates VMT.

6.3. VMT ANALYSIS

Transportation projects have the potential to change travel patterns. A key consideration under CEQA Guidelines Section 15064.3(b)(2) is whether a project will add additional vehicle travel onto a roadway network or induce VMT. According to the Governor's Office of Planning and Research's (OPR) *Technical Advisory on Evaluating Transportation Impacts in CEQA* (OPR December 2018), a project that would likely lead to a measurable and substantial increase in VMT requires an analysis assessing the amount of vehicle travel the project will induce. OPR provides example project types that would likely lead to a measurable and substantial increase to VMT. The types of projects include the addition of through lanes on existing or new highways (including general-purpose lanes), HOV lanes, peak period lanes, auxiliary lanes, and lanes through grade-separated interchanges.

The proposed project and Santa Maria Way Interchange Modification are local access improvements, providing secondary/local access to the existing development east of US-101. Neither improvement adds travel lanes or increases the capacity of the existing roadways. Additionally, neither the proposed project nor Santa Maria Way Interchange Modification change existing land uses or generate new trips to the study area. As shown in Figures 4, 13, and 16, traffic volumes remain the same with the project and Santa Maria Way Interchange Modification as under the existing conditions.

The proposed project and Santa Maria Way Interchange Modification would mainly redistribute existing traffic, improve safety and emergency response times, and provide secondary access to the study area. As a result, the project may decrease VMT for the region. By providing a local connection to UVP, the proposed project would reduce VMT for drivers in the study area coming from or heading to areas near or south of UVP or wishing to access the Elks Unocal Event Center and sites east of US-101. With construction of the proposed project, drivers could access UVP or US-101 SB without the need to travel out of their way to the Santa Maria interchange. According to the CEQA Guidelines Section 15064.3(b)(2), "Transportation projects that reduce, or have no impact on, vehicle miles traveled should be presumed to cause a less than significant transportation impact." Therefore, this project would have no significant impact on induced travel or VMT.

7. SUMMARY

This TIS provided an evaluation of the potential traffic impacts from the proposed project, which includes an extension of UVP to the east as well as a new connection of UVP with Rodeo Drive. Pursuant to Caltrans requirements, the Santa Maria Way Interchange Modification was also evaluated for informational purposes. The Santa Maria Way Interchange Modification includes extending Santa Maria Way to the east and reconstructing the associated intersections. Due to the proximity of the project to the Elks Unocal Event Center, Saturday night operations during a large event were evaluated along with the typical AM and PM weekday peak periods. All three peak periods were evaluated for both the project and the Santa Maria Way Interchange Modification.

All the study intersections currently operate at LOS C or better in the AM and PM weekday conditions. The Santa Maria Way/College Drive/Bradley Drive intersection will operate at LOS E in the PM peak hour 2040 with or without the project. With the project, operations at the intersection would improve.

The intersection of the Elks Unocal Event Center Access and Rodeo Drive is also expected to deteriorate without the project, beginning in 2025. However, the unacceptable operations (LOS D or lower) are only expected to occur during large events at the Elks Unocal Event Center. However, permanent improvements are not generally recommended for operational issues which occur sporadically, such as those generated by large events at the Elks Unocal Event Center. Because the intersection will serve typical peak period traffic volumes efficiently, no mitigation is recommended at this time.

In addition to the intersections, the project is not expected to have a significant impact on the ramp or segments evaluated in this study. Although UVP is expected to operate above design capacity with or without the project in 2040, the intersections are expected to operate with acceptable levels of service; therefore, per the *OCP*, the roadway LOS is acceptable. Lastly, the project can be constructed without any traffic conflicts, avoiding any construction safety impacts.

The Santa Maria Way Interchange Modification is not expected to result in a change in traffic volumes and traffic patterns; therefore, no changes in V/C ratios or delays are expected and there will not be significant impacts. However, with or without the project, the southbound US-101 ramp intersections at Santa Maria Way and UVP are likely to require signalization by 2040.

Further regarding the Santa Maria Way Interchange Modification, a few considerations need to be addressed. The need for the project is based on improved access and circulation for major events, as well as emergency vehicles. The modifications to the Santa Maria Way Interchange lack a redundant point of access to the Elks Unocal Event Center, which will negatively impact traffic operations, circulation, and emergency response times. In addition, improvements to the Santa Maria Way Interchange would need to be constructed while maintaining existing traffic due to lack of alternative routes, creating potential hazards for users and construction workers.

All improvements will require approval from County Public Works, including review of County Engineering Standards, sight distance requirements, and emergency access requirements.

8. REFERENCES

[1] County of Sana Barbara. June 2019.

[2] County of Santa Barbara Public Works, September 2011.

[3] *County of Santa Barbara Environmental Thresholds and Guidelines Manual*. County of Santa Barbara Planning and Development, October 2008.

[4] *Orcutt Community Plan*. Santa Barbara County Executive Office, June 2019.

[5] *Santa Barbara County Congestion Management Program.* Santa Barbara County Association of Governments, June 2009.

[6] *Caltrans California Road System (CRS) Maps*. California Department of Transportation. <https://caltrans.maps.arcgis.com/apps/webappviewer/index.html?id=026e830c914c495797c969a3e5668538>

[7] *Caltrans Performance Measurement System (PeMS)*. California Department of Transportation. <http://pems.dot.ca.gov/?report_form=1&dnode=VDS&content=loops&tab=det_tod&export=&station_id=501010062&s_time_id=1538352000&s_time_id_f=10%2F01%2F2018&e_time_id=1538956740&e_time_id_f=10%2F07%2F2018&dow_2=on&dow_3=on&dow_4=on&q=flow&fn=1&pct1=25&pct2=75&chart.x=50&chart.y=8>

[8] *Caltrans Peak Hour Volume Data*. California Department of Transportation. <https://dot.ca.gov/-/media/dot-media/programs/traffic-operations/documents/census/peak-hour/2017-peak-hours-report-kdfactor-a11y.pdf>

[9] Transportation Injury Mapping System (TIMS). University of California, Berkeley. < http://tims.berkeley.edu/>, accessed February 2020.

[10] *Trip Generation, 10th Edition*. Institute of Transportation Engineers (ITE). Washington, D.C., 2017.

[11] *Parking Generation Manual, 5th Edition*. Institute of Transportation Engineers (ITE). Washington, D.C., 2019.

[12] *Draft Regional Growth Forecast 2050 Santa Barbara County, Population, Job, and Household Forecasts to 2050*. Santa Barbara County Association of Governments, October 2018.

[13] *Orcutt Community Plan Update, Proposed Final Environmental Impact Report (95-EIR-01, State Clearinghouse No. 9503055)*. County of Santa Barbara Planning and Development.

LIST OF ACRONYMS

CALTRANS	CALIFORNIA DEPARTMENT OF TRANSPORTATION
CCR	CALIFORNIA CODE OF REGULATIONS
CEQA	CALIFORNIA ENVIRONMENTAL QUALITY ACT
CHP	CALIFORNIA HIGHWAY PATROL
CLASS P-3	PRIMARY 3 ROAD
CLASS S-1	SECONDARY 1 ROAD
CMP	CONGESTION MANAGEMENT PROGRAM
CRS	CALIFORNIA ROAD SYSTEM
GPA	GENERAL PLAN AMENDMENT
HCM	HIGHWAY CAPACITY MANUAL
HCS	HIGHWAY CAPACITY SOFTWARE
ICE	INTERSECTION CONTROL EVALUATION
ICU	INTERSECTION CAPACITY UTILIZATION
IS-MND	INITIAL STUDY-MITIGATED NEGATIVE DECLARATION
ITE	INSTITUTE OF TRANSPORTATION ENGINEERS
LOS	LEVEL OF SERVICE
NB	NORTHBOUND
OCP	ORCUTT COMMUNITY PLAN
OPR	GOVERNOR'S OFFICE OF PLANNING AND RESEARCH
PEMS	CALTRANS PERFORMANCE MEASUREMENT SYSTEM
PRC	CALIFORNIA PUBLIC RESOURCES CODE
PSR	PROJECT STUDY REPORT
SB	SOUTHBOUND
SB	SENATE BILL
SBCAG	SANTA BARBARA COUNTY ASSOCIATION OF GOVERNMENTS
SMJUHSD	SANTA MARIA JOINT UNION HIGH SCHOOL DISTRICT
TI	TRAFFIC INTERCHANGE
TIMS	CALIFORNIA TRANSPORTATION INJURY MAPPING SYSTEM
TIS	TRAFFIC IMPACT STUDY
US-101	US HIGHWAY 101
UVP	UNION VALLEY PARKWAY
V/C	VOLUME-TO-CAPACITY
VMT	VEHICLE MILES TRAVELED
VPD	VEHICLES PER DAY

Appendix A – Caltrans Comment Letter

DEPARTMENT OF TRANSPORTATION
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Making Conservation a California Way of Life.

January 10, 2020 SB-101-83.5

Mark Friedlander
County of Santa Barbara
Planning & Development
123 E. Anapamu Street
Santa Barbara, CA 93101

COMMENTS FOR THE DRAFT TRAFFIC STUDY AND DRAFT CONCEPTUAL DESIGN FOR THE ORCUTT COMMUNITY PLAN AMENDMENT PROJECT

Dear Mr. Friedlander:

The California Department of Transportation (Caltrans) thanks you for the opportunity to review the Draft Traffic Study and Draft Conceptual Design Drawings for the Orcutt Community Plan Amendment Project and offers the following comments at this time.

General Comments

Caltrans supports local planning efforts that are consistent with State planning priorities intended to promote equity, strengthen the economy, protect the environment, and promote public health and safety. We accomplish this by working with local jurisdictions to achieve a shared vision of how the transportation system should and can accommodate interregional and local travel.

Projects that support smart growth principles which include improvements to pedestrian, bicycle, and transit infrastructure (or other key Transportation Demand Strategies) are supported by Caltrans and are consistent with our mission, vision, and goals.

Please be aware that if any work is completed in the State's right-of-way it will require an encroachment permit from Caltrans and must be done to our engineering and environmental standards, and at no cost to the State. The conditions of approval and the requirements for the encroachment permit are issued at the sole discretion of the Permits Office, and nothing in this letter shall be implied as limiting those future conditioned and requirements. For more information regarding the encroachment permit process, please visit our Encroachment Permit Website at: https://dot.ca.gov/caltrans-near-me/district-5/district-5-programs/d5-encroachment-permits

Specific Comments

Comment 1

There are currently access denial restrictions on the US 101/Union Valley Parkway (UVP) interchange that was acquired at significant cost to the State. If the project proposes to construct Rodeo Drive as described in the December 2019 Draft Traffic Impact Study (TIS) with a new connection to US 101 at UVP, the new connection must be approved by Caltrans and the California Transportation Commission. It should be noted that at this time it has not been demonstrated to us the benefit of allowing this connection concept. Approving a new connection is a lengthy and costly process including a study that demonstrates that the adjacent interchanges cannot satisfactorily accommodate, or be modified to accommodate, the traffic identified in the proposed project. In addition, there are at times obligations to reimburse the State the current and developable value of the access when denial lines are removed.

An analysis of the Santa Maria Way Interchange, at a minimum, must be performed to include the anticipated project traffic demand. It could even be foreseeable that improvements to mainline US 101 would be an element of the proposed connection. Requirements for a new connection to an access-controlled highway can be found in the Caltrans Project Development Procedures Manual, Chapter 27 (PDPM) on the Caltrans website at https://dot.ca.gov/programs/design/manual-project-development-procedures-manual-pdpm.

Comment 2

Once a conceptual alternative is selected, any intersection improvement within the State Highway System (SHS) will require an Intersection Control Evaluation (ICE) to be conducted to determine what the appropriate intersection control will be. The ICE will need to evaluate stop control, signalization, and a roundabout alternative. This is required per Caltrans Traffic Operations Policy Directive 13-02 and Section 4C.01 of the 2014 California Manual on Uniform Traffic Control Devices (MUTCD) which reads in part:

Section 4C.01 Studies and Factors for Justifying Traffic Control Signals

Standard:

01 - An engineering study of traffic conditions, pedestrian characteristics, and physical characteristics of the location shall be performed to determine whether installation of a traffic control signal is justified at a particular location.

01a - On State highways, the engineering study shall include consideration of a roundabout (yield control). If a roundabout is determined to provide a viable and practical solution, it shall be studied in lieu of, or in addition to a traffic control signal.

Guidance:

01b - On local streets and highways, the engineering study should include consideration of a roundabout (yield control). If a roundabout is determined to provide a viable and practical solution, it should be studied in lieu of, or in addition to a traffic control signal.

Support:

01c - Refer to Caltrans' website (http://www.dot.ca.gov/hq/traffops/liaisons/ice.html) for more information on the Traffic Operations Policy Directive 13-02, Intersection Control Evaluation (ICE), and other resources for the evaluation of intersection traffic control strategies.

We look forward to continued coordination with the County on this project. If you have any questions, or need further clarification on items discussed above, please contact me at (805) 549-3131 or ingrid.mcroberts@dot.ca.gov.

Sincerely,

Ingrid McRoberts

Ingrid McRoberts
Development Review Coordinator
District 5, LD-IGR South Branch

cc: SBCAG

Appendix B – Traffic Volume Data

National Data & Surveying Services

Intersection Turning Movement Count

Location: Santa Maria Way & S Bradley Rd
City: Santa Maria
Control: Signalized

Project ID: 19-02038-001
Date: 6/1/2019

Total

NS/EW Streets:	Santa Maria Way				Santa Maria Way				S Bradley Rd				S Bradley Rd				
PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	0	0	1	2	1	0	1.5	1.5	1	0	1	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
3:30 PM	51	57	13	0	9	44	23	3	25	69	45	0	14	69	8	0	430
3:45 PM	61	62	19	0	9	37	32	3	36	57	52	0	23	96	8	0	495
4:00 PM	48	44	21	0	5	32	32	2	42	51	62	0	28	62	10	2	441
4:15 PM	39	56	16	0	9	41	26	0	50	63	57	0	32	59	11	1	460
4:30 PM	54	43	16	0	9	31	41	2	38	57	38	0	25	75	9	3	441
4:45 PM	51	38	15	0	10	44	33	4	41	62	61	0	21	69	2	0	451
5:00 PM	47	34	17	0	8	39	37	4	38	61	35	0	29	69	3	1	422
5:15 PM	32	24	23	0	6	34	30	4	43	68	48	0	23	85	8	1	429
5:30 PM	29	28	21	0	11	47	29	2	24	57	10	0	23	80	5	1	367
5:45 PM	27	18	18	0	6	36	23	1	32	60	22	0	16	54	4	1	318
6:00 PM	48	18	24	0	1	33	29	1	35	75	40	0	15	80	10	1	410
6:15 PM	74	54	27	0	6	35	29	4	37	57	42	0	17	73	7	3	465
6:30 PM	77	37	20	0	5	30	28	2	34	52	34	0	20	100	5	1	445
6:45 PM	64	36	11	1	4	17	25	2	31	42	35	0	12	64	6	1	351
7:00 PM	43	28	11	0	5	21	20	2	27	46	44	0	10	57	7	1	322
7:15 PM	36	39	23	0	7	22	32	0	18	36	21	1	9	48	5	1	298
7:30 PM	35	27	8	0	5	12	21	2	26	42	29	0	13	40	7	1	268
7:45 PM	35	37	10	0	3	17	17	1	31	32	17	0	7	45	3	0	255
8:00 PM	31	38	13	1	6	12	20	4	23	39	29	0	9	43	4	1	273
8:15 PM	28	45	15	1	5	19	12	0	34	29	10	0	7	45	6	1	257
8:30 PM	62	92	58	0	9	17	14	0	29	30	32	0	13	48	3	2	409
8:45 PM	53	86	61	1	4	9	15	2	23	57	28	0	9	34	5	2	389
9:00 PM	36	104	65	1	2	21	20	2	17	28	34	0	10	36	3	1	380
9:15 PM	56	101	71	2	3	7	11	2	28	41	28	0	9	27	1	0	387

	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	1117	1146	596	7	147	657	599	49	762	1211	853	1	394	1458	140	26	9163
APPROACH %'s :	38.97%	39.99%	20.80%	0.24%	10.12%	45.25%	41.25%	3.37%	26.95%	42.84%	30.17%	0.04%	19.52%	72.25%	6.94%	1.29%	
PEAK HR :	03:45 PM - 04:45 PM																TOTAL
PEAK HR VOL :	202	205	72	0	32	141	131	7	166	228	209	0	108	292	38	6	1837
PEAK HR FACTOR :	0.828	0.827	0.857	0.000	0.889	0.860	0.799	0.583	0.830	0.905	0.843	0.000	0.844	0.760	0.864	0.500	0.928
	0.843				0.937				0.887				0.874				

National Data & Surveying Services

Intersection Turning Movement Count

Location: US-101 Ramp/Santa Maria Way & US-101 NB On-Ramp
City: Santa Maria
Control: 1-Way Stop(WB)

Project ID: 19-02052-002
Date: 7/23/2019

Total

NS/EW Streets:	US-101 Ramp/Santa Maria Way				US-101 Ramp/Santa Maria Way				US-101 NB On-Ramp				US-101 NB On-Ramp				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	23	1	0	5	0	58	0	0	0	0	0	0	2	0	0	89
7:15 AM	0	37	3	0	7	0	73	0	0	0	0	0	0	0	3	0	123
7:30 AM	0	38	3	0	5	0	68	0	0	0	0	0	0	3	3	0	120
7:45 AM	0	54	1	0	5	0	92	0	0	0	0	0	0	3	5	0	160
8:00 AM	0	41	1	0	2	0	71	0	0	0	0	0	0	1	5	0	121
8:15 AM	0	38	2	0	3	0	77	0	0	0	0	0	0	3	1	0	124
8:30 AM	0	34	1	0	5	0	64	0	0	0	0	0	0	4	1	0	109
8:45 AM	0	31	2	0	9	0	64	0	0	0	0	0	0	10	5	0	121
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	296	14	0	41	0	567	0	0	0	0	0	0	26	23	0	967
APPROACH %'s :	0.00%	95.48%	4.52%	0.00%	6.74%	0.00%	93.26%	0.00%					0.00%	53.06%	46.94%	0.00%	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	0	171	7	0	15	0	308	0	0	0	0	0	0	10	14	0	525
PEAK HR FACTOR :	0.000	0.792	0.583	0.000	0.750	0.000	0.837	0.000	0.000	0.000	0.000	0.000	0.000	0.833	0.700	0.000	0.820
	0.809				0.832								0.750				

	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
PM	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	59	0	0	5	0	71	0	0	0	0	0	0	6	8	0	149
4:15 PM	0	77	1	0	2	0	84	0	0	0	0	0	0	15	8	0	187
4:30 PM	0	72	1	0	2	0	93	0	0	0	0	0	0	18	15	0	201
4:45 PM	0	64	1	0	2	0	73	0	0	0	0	0	0	33	6	0	179
5:00 PM	0	55	2	0	1	0	101	0	0	0	0	0	0	15	6	0	180
5:15 PM	0	65	0	0	3	0	85	0	0	0	0	0	0	7	6	0	166
5:30 PM	0	58	1	0	1	0	75	0	0	0	0	0	0	5	5	0	145
5:45 PM	0	52	1	0	0	0	92	1	0	0	0	0	0	3	2	0	151
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	502	7	0	16	0	674	1	0	0	0	0	0	102	56	0	1358
APPROACH %'s :	0.00%	98.62%	1.38%	0.00%	2.32%	0.00%	97.54%	0.14%					0.00%	64.56%	35.44%	0.00%	
PEAK HR :	04:15 PM - 05:15 PM																TOTAL
PEAK HR VOL :	0	268	5	0	7	0	351	0	0	0	0	0	0	81	35	0	747
PEAK HR FACTOR :	0.000	0.870	0.625	0.000	0.875	0.000	0.869	0.000	0.000	0.000	0.000	0.000	0.000	0.614	0.583	0.000	0.929
	0.875				0.877								0.744				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Santa Maria Way/Morningside Dr & US-101 NB Ramp
City: Santa Maria
Control: 1-Way Stop(WB)

Project ID: 19-02038-003
Date: 6/1/2019

Total

NS/EW Streets:	Santa Maria Way/Morningside Dr				Santa Maria Way/Morningside Dr				US-101 NB Ramp				US-101 NB Ramp				
PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	0	1	0	0	0	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
3:30 PM	0	26	15	0	63	0	47	0	0	0	0	0	0	7	17	0	175
3:45 PM	0	37	35	0	79	0	45	0	0	0	0	0	0	7	18	0	221
4:00 PM	0	30	41	0	113	0	51	0	0	0	0	0	0	4	4	0	243
4:15 PM	0	33	55	0	94	0	51	0	0	0	0	0	0	7	14	0	254
4:30 PM	0	24	60	0	125	0	34	0	0	0	0	0	0	2	13	0	258
4:45 PM	0	28	64	0	135	0	38	0	0	0	0	0	0	1	24	0	290
5:00 PM	0	20	85	0	137	0	27	0	0	0	0	0	0	4	23	0	296
5:15 PM	0	15	109	0	133	0	10	0	0	0	0	0	0	1	19	0	287
5:30 PM	0	10	101	0	104	0	8	0	0	0	0	0	0	2	47	0	272
5:45 PM	0	11	68	0	134	0	2	0	0	0	0	0	0	3	12	0	230
6:00 PM	0	23	67	0	154	0	9	0	0	0	0	0	0	2	22	0	277
6:15 PM	0	24	58	0	132	0	32	0	0	0	0	0	0	1	58	0	305
6:30 PM	0	23	32	0	62	0	30	0	0	0	0	0	0	17	55	0	219
6:45 PM	0	20	28	0	55	0	38	0	0	0	0	0	0	19	24	0	184
7:00 PM	0	26	13	0	37	0	36	0	0	0	0	0	0	25	18	0	155
7:15 PM	0	20	9	0	33	0	29	0	0	0	0	0	0	30	27	0	148
7:30 PM	0	16	13	0	19	0	24	0	0	0	0	0	0	29	17	0	118
7:45 PM	0	14	6	0	29	0	29	0	0	0	0	0	0	18	31	0	127
8:00 PM	0	19	5	0	18	0	36	0	0	0	0	0	0	46	46	0	170
8:15 PM	0	13	7	0	19	0	15	0	0	0	0	0	0	45	69	0	168
8:30 PM	0	18	4	0	26	0	28	0	0	0	0	0	0	2	197	0	275
8:45 PM	0	20	9	0	23	0	32	0	0	0	0	0	0	2	209	0	295
9:00 PM	0	25	7	0	11	0	34	0	0	0	0	0	0	1	227	0	305
9:15 PM	0	30	3	0	5	0	22	0	0	0	0	0	0	2	248	0	310
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	525	894	0	1740	0	707	0	0	0	0	0	0	277	1439	0	5582
APPROACH %'s :	0.00%	37.00%	63.00%	0.00%	71.11%	0.00%	28.89%	0.00%					0.00%	16.14%	83.86%	0.00%	
PEAK HR :	08:30 PM - 09:30 PM																TOTAL
PEAK HR VOL :	0	93	23	0	65	0	116	0	0	0	0	0	0	7	881	0	1185
PEAK HR FACTOR :	0.000	0.775	0.639	0.000	0.625	0.000	0.853	0.000	0.000	0.000	0.000	0.000	0.000	0.875	0.888	0.000	0.956
	0.879				0.823								0.888				

National Data & Surveying Services

Intersection Turning Movement Count

Location: US-101 SB Ramps & Santa Maria Way
City: Santa Maria
Control: 1-Way Stop(SB)

Project ID: 19-02038-002
Date: 6/1/2019

Total

NS/EW Streets:	US-101 SB Ramps				US-101 SB Ramps				Santa Maria Way				Santa Maria Way				
PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	1	0	1	0	0	1	1	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
3:30 PM	0	0	0	0	44	0	79	0	0	69	39	0	1	42	0	0	274
3:45 PM	0	0	0	0	47	0	96	0	0	74	33	0	1	46	0	0	297
4:00 PM	0	0	0	0	70	0	74	0	0	91	34	0	4	39	0	0	312
4:15 PM	0	0	0	0	57	0	71	0	0	91	36	0	2	40	0	0	297
4:30 PM	0	0	0	0	82	0	74	0	0	70	28	0	3	38	0	0	295
4:45 PM	0	0	0	0	90	0	58	0	0	90	29	0	10	47	0	0	324
5:00 PM	0	0	0	0	94	0	59	0	0	62	44	0	2	36	0	0	297
5:15 PM	0	0	0	0	82	0	53	0	0	69	39	0	9	29	0	0	281
5:30 PM	0	0	0	0	75	0	32	0	0	38	39	0	5	48	0	0	237
5:45 PM	0	0	0	0	96	0	37	0	0	39	35	0	2	24	0	0	233
6:00 PM	0	0	0	0	102	0	53	0	0	66	20	0	6	36	0	0	283
6:15 PM	0	0	0	0	72	0	80	0	0	77	25	0	11	76	0	0	341
6:30 PM	0	0	0	0	50	0	84	0	0	54	24	0	19	49	0	0	280
6:45 PM	0	0	0	0	34	0	76	0	0	56	14	0	12	37	0	0	229
7:00 PM	0	0	0	0	25	0	49	0	0	49	18	0	11	34	0	0	186
7:15 PM	0	0	0	0	25	0	56	0	0	36	19	0	2	41	0	0	179
7:30 PM	0	0	0	0	13	0	44	0	0	31	17	0	10	26	0	0	141
7:45 PM	0	0	0	0	20	0	50	0	0	35	12	0	15	30	0	0	162
8:00 PM	0	0	0	0	18	0	35	0	0	38	13	0	14	50	0	1	169
8:15 PM	0	0	0	0	8	0	39	0	0	24	19	0	22	50	0	0	162
8:30 PM	0	0	0	0	21	0	40	0	0	35	21	0	61	164	0	0	342
8:45 PM	0	0	0	0	13	0	44	0	0	37	19	0	72	165	0	1	351
9:00 PM	0	0	0	0	10	0	33	0	0	39	18	0	70	173	0	0	343
9:15 PM	0	0	0	0	7	0	44	0	0	28	14	0	72	194	0	1	360
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	1155	0	1360	0	0	1298	609	0	436	1514	0	3	6375
APPROACH %'s :					45.92%	0.00%	54.08%	0.00%	0.00%	68.07%	31.93%	0.00%	22.32%	77.52%	0.00%	0.15%	
PEAK HR :	08:30 PM - 09:30 PM																TOTAL
PEAK HR VOL :	0	0	0	0	51	0	161	0	0	139	72	0	275	696	0	2	1396
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.607	0.000	0.915	0.000	0.000	0.891	0.857	0.000	0.955	0.897	0.000	0.500	0.969
					0.869				0.925				0.911				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Morning Side Dr & US-101 NB On-Ramp
City: Santa Maria
Control: No Control

Project ID: 19-02052-102
Date: 7/23/2019

Total

NS/EW Streets:	Morning Side Dr				Morning Side Dr				US-101 NB On-Ramp				US-101 NB On-Ramp				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	1	0	0	0	1	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	2	0	0	0	0	0	0	0	1	0	5	0	0	0	0	0	8
7:15 AM	3	0	0	0	0	1	0	0	1	0	9	0	0	0	0	0	14
7:30 AM	5	0	0	0	0	0	1	0	1	0	7	0	0	0	0	0	14
7:45 AM	8	5	0	0	0	0	0	0	0	0	6	0	0	0	0	0	19
8:00 AM	5	0	0	0	0	2	1	0	0	0	3	0	0	0	0	0	11
8:15 AM	3	0	0	0	0	0	1	0	2	0	3	0	0	0	0	0	9
8:30 AM	4	0	0	0	0	0	1	0	1	0	5	0	0	0	0	0	11
8:45 AM	4	1	0	0	0	0	11	0	0	0	11	0	0	0	0	0	27
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	34	6	0	0	0	3	15	0	6	0	49	0	0	0	0	0	113
APPROACH %'s :	85.00%	15.00%	0.00%	0.00%	0.00%	16.67%	83.33%	0.00%	10.91%	0.00%	89.09%	0.00%					
PEAK HR :	07:15 AM - 08:15 AM																TOTAL
PEAK HR VOL :	21	5	0	0	0	3	2	0	2	0	25	0	0	0	0	0	58
PEAK HR FACTOR :	0.656	0.250	0.000	0.000	0.000	0.375	0.500	0.000	0.500	0.000	0.694	0.000	0.000	0.000	0.000	0.000	0.763
	0.500				0.417				0.675								

	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
PM	0	1	0	0	0	1	0	0	0	1	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	9	0	0	0	0	0	5	0	1	0	4	0	0	0	0	0	19
4:15 PM	15	0	0	0	0	0	8	0	2	0	1	0	0	0	0	0	26
4:30 PM	29	0	0	0	0	0	4	0	0	0	3	0	0	0	0	0	36
4:45 PM	37	0	0	0	0	0	2	0	1	0	2	0	0	0	0	0	42
5:00 PM	19	0	0	0	0	0	2	0	1	0	2	0	0	0	0	0	24
5:15 PM	11	0	0	0	0	0	2	0	1	0	2	0	0	0	0	0	16
5:30 PM	9	0	0	0	0	0	1	0	1	0	1	0	0	0	0	0	12
5:45 PM	3	0	0	0	0	0	2	0	1	0	0	0	0	0	0	0	6
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	132	0	0	0	0	0	26	0	8	0	15	0	0	0	0	0	181
APPROACH %'s :	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	0.00%	34.78%	0.00%	65.22%	0.00%					
PEAK HR :	04:15 PM - 05:15 PM																TOTAL
PEAK HR VOL :	100	0	0	0	0	0	16	0	4	0	8	0	0	0	0	0	128
PEAK HR FACTOR :	0.676	0.000	0.000	0.000	0.000	0.000	0.500	0.000	0.500	0.000	0.667	0.000	0.000	0.000	0.000	0.000	0.762
	0.676				0.500				1.000								

National Data & Surveying Services

Intersection Turning Movement Count

Location: Morningside Dr & Event Center Acess
City: Santa Maria
Control: No Control

Project ID: 19-02038-004
Date: 6/1/2019

Total

NS/EW Streets:	Morningside Dr				Morningside Dr				Event Center Acess				Event Center Acess				
PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
3:30 PM	0	5	2	0	30	50	0	0	0	0	0	0	3	0	7	0	97
3:45 PM	0	10	0	0	33	77	0	0	0	0	0	0	1	0	4	0	125
4:00 PM	0	11	0	0	26	114	0	0	0	0	0	0	1	0	9	0	161
4:15 PM	0	7	3	0	28	129	0	0	0	0	0	0	1	0	11	0	179
4:30 PM	0	2	0	0	26	148	0	0	0	0	0	0	1	0	11	0	188
4:45 PM	0	10	0	0	30	144	0	0	0	0	0	0	3	0	11	0	198
5:00 PM	0	4	2	0	35	181	0	0	0	0	0	0	2	0	12	0	236
5:15 PM	0	4	1	0	25	196	0	0	0	0	0	0	0	0	13	0	239
5:30 PM	0	1	2	0	43	165	0	0	0	0	0	0	1	0	14	0	226
5:45 PM	0	2	1	0	73	149	0	0	0	0	0	0	0	0	14	0	239
6:00 PM	0	0	0	0	56	166	0	0	0	0	0	0	0	0	19	0	241
6:15 PM	0	0	0	0	58	142	0	0	0	0	0	0	1	0	44	0	245
6:30 PM	0	7	3	0	29	76	0	0	0	0	0	0	1	0	48	0	164
6:45 PM	0	8	0	0	18	67	0	0	0	0	0	0	1	0	48	0	142
7:00 PM	0	21	0	0	7	42	0	0	0	0	0	0	1	0	27	0	98
7:15 PM	0	33	0	0	12	35	0	0	0	0	0	0	1	0	15	0	96
7:30 PM	0	30	0	0	8	25	0	0	0	0	0	0	0	0	24	0	87
7:45 PM	0	34	1	0	13	22	0	0	0	0	0	0	1	0	21	1	93
8:00 PM	0	75	1	0	5	18	0	0	0	0	0	0	0	0	24	0	123
8:15 PM	0	76	0	0	16	7	0	0	0	0	0	0	2	0	40	0	141
8:30 PM	0	134	0	0	11	15	0	0	0	0	0	0	0	0	111	0	271
8:45 PM	0	114	0	0	12	15	0	0	0	0	0	0	0	0	107	0	248
9:00 PM	0	119	0	0	5	11	0	0	0	0	0	0	0	0	100	1	236
9:15 PM	0	129	0	0	12	8	0	0	0	0	0	0	0	0	118	0	267
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	836	16	0	611	2002	0	0	0	0	0	0	21	0	852	2	4340
APPROACH %'s :	0.00%	98.12%	1.88%	0.00%	23.38%	76.62%	0.00%	0.00%					2.40%	0.00%	97.37%	0.23%	
PEAK HR :	08:30 PM - 09:30 PM																TOTAL
PEAK HR VOL :	0	496	0	0	40	49	0	0	0	0	0	0	0	0	436	1	1022
PEAK HR FACTOR :	0.000	0.925	0.000	0.000	0.833	0.817	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.924	0.250	0.943
	0.925				0.824								0.926				

National Data & Surveying Services

Intersection Turning Movement Count

Location: US-101 NB Ramp & E Union Valley Pkwy
City: Santa Maria
Control: 1-Way Stop(NB)

Project ID: 19-02038-005
Date: 6/1/2019

Total

NS/EW Streets:	US-101 NB Ramp				US-101 NB Ramp				E Union Valley Pkwy				E Union Valley Pkwy				
PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
3:30 PM	18	0	0	0	0	0	0	0	0	2	132	0	2	0	0	0	154
3:45 PM	17	0	0	0	0	0	0	0	0	4	158	0	2	1	0	0	182
4:00 PM	18	0	0	0	0	0	0	0	0	2	145	0	0	2	0	0	167
4:15 PM	19	0	0	0	0	0	0	0	0	1	140	0	2	1	0	0	163
4:30 PM	17	0	0	0	0	0	0	0	0	2	170	0	1	1	0	0	191
4:45 PM	26	0	0	0	0	0	0	0	0	4	120	0	1	3	0	0	154
5:00 PM	11	0	0	2	0	0	0	0	0	3	165	0	1	0	0	0	182
5:15 PM	14	0	1	0	0	0	0	0	0	5	177	1	4	3	0	0	205
5:30 PM	17	0	1	0	0	0	0	0	0	4	186	0	6	0	0	0	214
5:45 PM	18	0	0	0	0	0	0	0	0	6	125	0	2	0	0	0	151
6:00 PM	17	0	1	0	0	0	0	0	0	1	148	0	0	5	0	0	172
6:15 PM	17	0	0	0	0	0	0	0	0	4	124	0	1	2	0	0	148
6:30 PM	21	0	0	0	0	0	0	0	0	0	104	0	0	1	0	0	126
6:45 PM	14	0	0	0	0	0	0	0	0	0	95	0	0	0	0	0	109
7:00 PM	7	0	0	0	0	0	0	0	0	0	72	0	0	0	0	0	79
7:15 PM	9	0	1	0	0	0	0	0	0	2	66	0	2	1	0	0	81
7:30 PM	5	0	0	0	0	0	0	0	0	3	32	0	2	3	0	0	45
7:45 PM	15	0	0	1	0	0	0	0	0	0	50	0	0	0	0	0	66
8:00 PM	6	0	0	0	0	0	0	0	0	1	57	0	1	0	0	0	65
8:15 PM	6	0	0	0	0	0	0	0	0	3	42	0	1	1	0	0	53
8:30 PM	6	0	1	0	0	0	0	0	0	3	65	0	2	2	0	0	79
8:45 PM	10	0	0	0	0	0	0	0	0	2	79	0	0	2	0	0	93
9:00 PM	12	0	0	0	0	0	0	0	0	1	60	0	1	0	0	0	74
9:15 PM	11	0	0	0	0	0	0	0	0	1	62	0	1	1	0	0	76
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	331	0	5	3	0	0	0	0	0	54	2574	1	32	29	0	0	3029
APPROACH %'s :	97.64%	0.00%	1.47%	0.88%					0.00%	2.05%	97.91%	0.04%	52.46%	47.54%	0.00%	0.00%	
PEAK HR :	04:45 PM - 05:45 PM																TOTAL
PEAK HR VOL :	68	0	2	2	0	0	0	0	0	16	648	1	12	6	0	0	755
PEAK HR FACTOR :	0.654	0.000	0.500	0.250	0.000	0.000	0.000	0.000	0.000	0.800	0.871	0.250	0.500	0.500	0.000	0.000	0.882
	0.692								0.875				0.643				

National Data & Surveying Services

Intersection Turning Movement Count

Location: US-101 SB Ramp & E Union Valley Pkwy
City: Santa Maria
Control: 1-Way Stop(SB)

Project ID: 19-02038-006
Date: 6/1/2019

Total

NS/EW Streets:	US-101 SB Ramp				US-101 SB Ramp				E Union Valley Pkwy				E Union Valley Pkwy				
PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0.3	0.3	1.3	0	0	1	0	0	1	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
3:30 PM	0	0	0	0	2	0	155	0	0	131	10	0	0	23	0	0	321
3:45 PM	0	0	0	0	2	1	132	0	0	161	16	0	0	13	0	0	325
4:00 PM	0	0	0	0	6	1	153	0	0	144	22	0	3	16	0	0	345
4:15 PM	0	0	0	0	7	2	140	0	0	131	8	0	0	22	0	0	310
4:30 PM	0	0	0	0	4	0	164	0	0	168	12	0	1	16	0	0	365
4:45 PM	0	0	0	0	3	0	146	0	0	122	5	0	1	28	0	0	305
5:00 PM	0	0	0	0	12	1	164	0	0	155	18	0	0	15	0	0	365
5:15 PM	0	0	0	0	26	0	166	0	0	162	21	1	2	12	0	0	390
5:30 PM	0	0	0	0	36	0	141	0	0	147	10	0	0	15	0	0	349
5:45 PM	0	0	0	0	34	0	201	0	0	99	8	0	0	21	0	0	363
6:00 PM	0	0	0	0	10	1	194	0	0	142	12	0	2	19	0	0	380
6:15 PM	0	0	0	0	4	0	147	0	0	121	9	0	2	17	0	0	300
6:30 PM	0	0	0	0	3	1	170	0	0	106	4	0	0	23	0	0	307
6:45 PM	0	0	0	0	2	2	136	0	0	88	8	0	0	13	0	0	249
7:00 PM	0	0	0	0	2	1	128	0	0	76	7	0	0	8	0	0	222
7:15 PM	0	0	0	0	0	0	128	0	0	62	3	0	0	9	0	0	202
7:30 PM	0	0	0	0	6	1	117	0	0	31	10	0	1	9	0	0	175
7:45 PM	0	0	0	0	0	0	122	0	0	48	10	0	1	12	0	0	193
8:00 PM	0	0	0	0	1	2	87	0	0	59	8	0	0	7	0	0	164
8:15 PM	0	0	0	0	1	0	103	0	0	42	5	0	0	6	0	0	157
8:30 PM	0	0	0	0	6	2	122	0	0	62	3	0	1	6	0	0	202
8:45 PM	0	0	0	0	10	0	113	0	0	66	4	0	1	12	0	0	206
9:00 PM	0	0	0	0	11	1	108	0	0	55	5	0	0	12	0	0	192
9:15 PM	0	0	0	0	9	0	112	0	0	52	5	0	0	14	0	0	192
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	197	16	3349	0	0	2430	223	1	15	348	0	0	6579
APPROACH %'s :					5.53%	0.45%	94.02%	0.00%	0.00%	91.56%	8.40%	0.04%	4.13%	95.87%	0.00%	0.00%	
PEAK HR :	05:15 PM - 06:15 PM																TOTAL
PEAK HR VOL :	0	0	0	0	106	1	702	0	0	550	51	1	4	67	0	0	1482
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.736	0.250	0.873	0.000	0.000	0.849	0.607	0.250	0.500	0.798	0.000	0.000	0.950
					0.861				0.818				0.845				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Bradley Road & Union Valley Pkwy
City: Santa Maria
Control: Signalized

Project ID: 19-02052-001
Date: 7/23/2019

Total

NS/EW Streets:	Bradley Road				Bradley Road				Union Valley Pkwy				Union Valley Pkwy				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	1	0	1	2	0	0	2	2	1	0	2	2	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	12	45	22	0	10	23	15	0	3	90	8	0	16	106	5	0	355
7:15 AM	14	57	28	0	11	32	8	0	3	100	12	0	18	113	2	0	398
7:30 AM	23	56	31	0	11	29	4	0	8	104	14	0	22	112	3	0	417
7:45 AM	25	95	39	0	13	42	6	0	12	160	8	0	11	102	4	0	517
8:00 AM	21	65	34	0	16	45	12	0	5	100	8	0	24	72	5	0	407
8:15 AM	14	56	22	0	14	41	10	0	3	109	10	0	21	93	3	0	396
8:30 AM	13	69	25	0	8	37	8	0	6	113	11	0	22	63	6	0	381
8:45 AM	13	85	35	0	10	41	8	0	11	85	21	0	21	89	6	0	425
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	135	528	236	0	93	290	71	0	51	861	92	0	155	750	34	0	3296
APPROACH %'s :	15.02%	58.73%	26.25%	0.00%	20.48%	63.88%	15.64%	0.00%	5.08%	85.76%	9.16%	0.00%	16.51%	79.87%	3.62%	0.00%	
PEAK HR :	07:15 AM - 08:15 AM																TOTAL
PEAK HR VOL :	83	273	132	0	51	148	30	0	28	464	42	0	75	399	14	0	1739
PEAK HR FACTOR :	0.830	0.718	0.846	0.000	0.797	0.822	0.625	0.000	0.583	0.725	0.750	0.000	0.781	0.883	0.700	0.000	0.841
	0.767				0.784				0.742				0.891				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	2	1	0	1	2	0	0	2	2	1	0	2	2	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	19	102	17	0	11	99	12	0	17	137	33	0	32	116	6	0	601
4:15 PM	8	78	25	0	14	103	17	0	8	139	41	0	36	110	9	0	588
4:30 PM	19	97	21	0	9	87	7	0	20	147	33	0	29	122	18	0	609
4:45 PM	21	75	30	0	5	116	19	0	19	152	26	0	39	145	4	0	651
5:00 PM	18	91	26	0	5	100	12	0	7	135	32	0	41	141	18	0	626
5:15 PM	15	85	26	0	15	99	20	0	12	128	31	0	50	165	16	0	662
5:30 PM	11	91	19	0	15	90	14	0	22	109	47	0	42	136	16	0	612
5:45 PM	15	87	28	0	17	102	22	0	17	111	27	0	42	99	19	0	586
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	126	706	192	0	91	796	123	0	122	1058	270	0	311	1034	106	0	4935
APPROACH %'s :	12.30%	68.95%	18.75%	0.00%	9.01%	78.81%	12.18%	0.00%	8.41%	72.97%	18.62%	0.00%	21.43%	71.26%	7.31%	0.00%	
PEAK HR :	04:45 PM - 05:45 PM																TOTAL
PEAK HR VOL :	65	342	101	0	40	405	65	0	60	524	136	0	172	587	54	0	2551
PEAK HR FACTOR :	0.774	0.940	0.842	0.000	0.667	0.873	0.813	0.000	0.682	0.862	0.723	0.000	0.860	0.889	0.750	0.000	0.963
	0.941				0.911				0.914				0.880				

National Data & Surveying Services

Intersection Turning Movement Count

Location: S Bradley Rd & E Union Valley Pkwy
City: Santa Maria
Control: Signalized

Project ID: 19-02038-007
Date: 6/1/2019

Total

NS/EW Streets:	S Bradley Rd				S Bradley Rd				E Union Valley Pkwy				E Union Valley Pkwy				
	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
PM	1	2	1	0	1	2	0	0	2	2	1	0	2	2	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
3:30 PM	14	71	24	0	13	74	12	0	18	89	26	0	42	85	17	1	486
3:45 PM	15	86	22	0	14	73	13	0	12	121	16	0	36	85	8	0	501
4:00 PM	13	73	30	0	13	100	17	0	9	108	16	0	28	100	19	0	526
4:15 PM	7	85	14	0	8	70	8	0	9	113	21	0	35	82	20	0	472
4:30 PM	13	83	25	0	11	110	14	0	12	121	17	0	41	100	16	0	563
4:45 PM	10	94	23	0	10	81	13	0	9	88	18	0	36	100	16	0	498
5:00 PM	16	80	33	0	10	97	20	0	8	96	20	0	26	116	13	0	535
5:15 PM	7	76	28	0	15	78	13	0	16	114	27	0	42	104	15	0	535
5:30 PM	5	76	28	0	9	63	13	0	9	108	11	0	25	101	25	0	473
5:45 PM	7	95	24	0	15	64	17	0	17	75	14	0	31	111	45	0	515
6:00 PM	8	107	26	0	22	62	12	0	14	92	32	0	35	113	43	0	566
6:15 PM	5	92	32	0	13	68	12	0	22	79	15	0	18	84	34	0	474
6:30 PM	18	84	25	0	8	66	21	0	16	74	14	0	35	92	42	0	495
6:45 PM	7	82	16	0	7	66	12	0	12	64	11	0	27	84	36	0	424
7:00 PM	10	76	10	0	10	53	5	0	6	53	10	0	25	87	13	0	358
7:15 PM	5	59	10	0	6	63	10	0	3	53	7	0	19	80	19	0	334
7:30 PM	7	53	14	0	6	43	11	0	7	35	14	0	14	78	15	1	298
7:45 PM	7	59	10	0	7	50	10	0	5	40	8	0	30	73	12	0	311
8:00 PM	5	60	19	0	10	68	10	0	7	33	13	0	20	53	11	0	309
8:15 PM	8	52	15	0	3	61	7	0	5	27	10	0	14	67	9	0	278
8:30 PM	7	51	10	0	9	50	6	0	2	46	10	0	13	86	8	0	298
8:45 PM	4	56	15	0	14	29	15	0	5	41	9	0	16	83	12	0	299
9:00 PM	8	50	11	0	11	42	8	0	4	31	14	0	16	72	8	0	275
9:15 PM	7	54	16	0	10	36	10	0	7	29	11	0	20	77	9	0	286
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	213	1754	480	0	254	1567	289	0	234	1730	364	0	644	2113	465	2	10109
APPROACH %'s :	8.70%	71.68%	19.62%	0.00%	12.04%	74.27%	13.70%	0.00%	10.05%	74.31%	15.64%	0.00%	19.98%	65.54%	14.42%	0.06%	
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	46	333	109	0	46	366	60	0	45	419	82	0	145	420	60	0	2131
PEAK HR FACTOR :	0.719	0.886	0.826	0.000	0.767	0.832	0.750	0.000	0.703	0.866	0.759	0.000	0.863	0.905	0.938	0.000	0.946
	0.946				0.874				0.869				0.970				

Appendix C – ICU Spreadsheets and Synchro Reports – Existing Conditions (2019)

E-W Street: Santa Maria Wy
N-S Street: College Dr/Bradley
Scenario: AM Peak — Right Turn Reduce 30%
Lane Capacity: 1600 — Free Movement
Dual Lefts Capacity (per lane): 1600

Movement	AM Existing Total Volume	AM Existing No. of Lanes	AM Existing Equivalent Lanes	AM Existing Movement V/C	AM Existing + Project Total Volume	AM Existing + Project No. of Lanes	AM Existing + Project Equivalent Lanes	AM Existing + Project Movement V/C
EB Left	70	1	1.00	0.04	70	1	1.00	0.04
Comb. L-T								
EB Thru	263	2	2.00	0.08	259	2	2.00	0.08
Comb. T-R								
EB Right	118	1	1.00	0.07	168	1	1.00	0.11
Comb. L-T-R								
WB Left	328	1	1.00	0.21	327	1	1.00	0.20
Comb. L-T								
WB Thru	352	1	1.69	0.13	349	1	1.69	0.13
Comb. T-R		1				1		
WB Right	64		0.31	0.13	64		0.31	0.13
Comb. L-T-R								
NB Left	304	1	1.02	0.19	304	1	1.02	0.19
Comb. L-T		1				1		
NB Thru	292	1	1.98	0.09	292	1	1.98	0.09
Comb. T-R								
NB Right	343	1	1.00	0.00	342	1	1.00	0.00
Comb. L-T-R								
SB Left	92	1	1.00	0.06	92	1	1.00	0.06
Comb. L-T								
SB Thru	244	1	1.69	0.09	244	1	1.69	0.09
Comb. T-R		1				1		
SB Right	44		0.31	0.09	44		0.31	0.09
Comb. L-T-R								

		AM Existing		AM Existing + Project
Critical Volumes	E-W:	0.29	E-W:	0.31
	N-S:	0.28	N-S:	0.28
	Total:	0.56	Total:	0.59
Lost Time		0.10		0.10
V/C		0.663		0.686
Level of Service		B		B

E-W Street: Santa Maria Wy
N-S Street: College Dr/Bradley
Scenario: AM Peak
Lane Capacity: 1600
Dual Lefts Capacity (per lane): 1600

Right Turn Reduce 30%
Free Movement

Movement	PM Existing Total Volume	PM Existing No. of Lanes	PM Existing Equivalent Lanes	PM Existing Movement V/C	PM Existing + Project Total Volume	PM Existing + Project No. of Lanes	PM Existing + Project Equivalent Lanes	PM Existing + Project Movement V/C
EB Left	65	1	1.00	0.04	65	1	1.00	0.04
Comb. L-T		0				0		
EB Thru	213	2	2.00	0.07	212	2	2.00	0.07
Comb. T-R		0				0		
EB Right	159	1	1.00	0.10	227	1	1.00	0.14
Comb. L-T-R		0				0		
WB Left	339	1	1.00	0.21	334	1	1.00	0.21
Comb. L-T		0				0		
WB Thru	298	1	1.51	0.12	283	1	1.49	0.12
Comb. T-R		1				1		
WB Right	96	0	0.49	0.12	96	0	0.51	0.12
Comb. L-T-R		0				0		
NB Left	238	1	0.82	0.18	238	1	0.82	0.18
Comb. L-T		1				1		
NB Thru	339	1	2.18	0.10	339	1	2.18	0.10
Comb. T-R		0				0		
NB Right	325	1	1.00	0.00	325	1	1.00	0.00
Comb. L-T-R		0				0		
SB Left	70	1	1.00	0.04	70	1	1.00	0.04
Comb. L-T		0				0		
SB Thru	422	1	1.82	0.14	422	1	1.82	0.14
Comb. T-R		1				1		
SB Right	41	0	0.18	0.14	41	0	0.18	0.14
Comb. L-T-R		0				0		

		PM Existing		PM Existing + Project
Critical Volumes	E-W:	0.31	E-W:	0.35
	N-S:	0.33	N-S:	0.33
	Total:	0.64	Total:	0.68

	PM Existing	PM Existing + Project
Lost Time	0.10	0.10

	PM Existing	PM Existing + Project
V/C	0.736	0.776
Level of Service	C	C

P Santa Maria Wy
N-S Street: College Dr/Bradley
Scenario: AM Peak — Right Turn Reduce 30%
Lane Capacity: 1600 — Free Movement
Dual Lefts Capacity (per lane): 1600

Movement	Sat Night Existing Total Volume	No. of Lanes	Equivalent Lanes	Movement V/C	Sat Night Existing + Project Total Volume	No. of Lanes	Equivalent Lanes	Movement V/C
EB Left	97	1	1.00	0.06	97	1	1.00	0.06
Comb. L-T		0				0		
EB Thru	156	2	2.00	0.05	147	2	2.00	0.05
Comb. T-R		0				0		
EB Right	85	1	1.00	0.05	122	1	1.00	0.08
Comb. L-T-R		0				0		
WB Left	46	1	1.00	0.03	46	1	1.00	0.03
Comb. L-T		0				0		
WB Thru	145	1	1.85	0.05	56	1	1.65	0.02
Comb. T-R		1				1		
WB Right	12	0	0.15	0.05	12	0	0.35	0.02
Comb. L-T-R		0				0		
NB Left	211	1	0.71	0.19	211	1	0.71	0.19
Comb. L-T		1				1		
NB Thru	383	1	2.29	0.10	383	1	2.29	0.10
Comb. T-R		0				0		
NB Right	255	1	1.00	0.00	255	1	1.00	0.00
Comb. L-T-R		0				0		
SB Left	24	1	1.00	0.02	24	1	1.00	0.02
Comb. L-T		0				0		
SB Thru	54	1	0.95	0.04	54	1	0.95	0.04
Comb. T-R		1				1		
SB Right	60	0	1.05	0.04	60	0	1.05	0.04
Comb. L-T-R		0				0		

	Sat Night Existing		Sat Night Existing + Project	
Critical Volumes	E-W:	0.11	E-W:	0.11
	N-S:	0.22	N-S:	0.22
	Total:	0.33	Total:	0.33
Lost Time		0.10		0.10
V/C		0.431		0.426
Level of Service		A		A

E-W Street: Union Valley Pkwy
N-S Street: Bradley Rd
Scenario: AM Peak — Right Turn Reduce 30%
Lane Capacity: 1600
Dual Lefts Capacity (per lane): 1600

	AM Existing				AM Existing + Project			
Movement	Total Volume	No. of Lanes	Equivalent Lanes	Movement V/C	Total Volume	No. of Lanes	Equivalent Lanes	Movement V/C
EB Left	28	2	2.00	0.01	28	2	2.00	0.01
Comb. L-T								
EB Thru	464	2	2.00	0.15	465	2	2.00	0.15
Comb. T-R								
EB Right	29	1	1.00	0.02	42	1	1.00	0.03
Comb. L-T-R								
WB Left	75	2	2.00	0.02	75	2	2.00	0.02
Comb. L-T								
WB Thru	399	2	2.00	0.12	400	2	2.00	0.13
Comb. T-R								
WB Right	10	1	1.00	0.01	15	1	1.00	0.01
Comb. L-T-R								
NB Left	83	1	1.00	0.05	83	1	1.00	0.05
Comb. L-T								
NB Thru	273	2	2.00	0.09	273	2	2.00	0.09
Comb. T-R								
NB Right	92	1	1.00	0.00	133	1	1.00	0.00
Comb. L-T-R								
SB Left	51	1	1.00	0.03	52	1	1.00	0.03
Comb. L-T								
SB Thru	148	1	1.66	0.06	148	1	1.66	0.06
Comb. T-R		1				1		
SB Right	30		0.34	0.06	30		0.34	0.06
Comb. L-T-R								

	AM Existing		AM Existing + Project	
Critical Volumes	E-W:	0.17	E-W:	0.17
	N-S:	0.12	N-S:	0.12
	Total:	0.29	Total:	0.29
Lost Time		0.10		0.10
V/C		0.386		0.387
Level of Service		A		A

E-W Street: Union Valley Pkwy
N-S Street: Bradley Rd
Scenario: PM Peak — Right Turn Reduce 30%
Lane Capacity: 1600
Dual Lefts Capacity (per lane): 1600

Movement	PM Existing Total Volume	PM Existing No. of Lanes	PM Existing Equivalent Lanes	PM Existing Movement V/C	PM Existing + Project Total Volume	PM Existing + Project No. of Lanes	PM Existing + Project Equivalent Lanes	PM Existing + Project Movement V/C
EB Left	60	2	2.00	0.02	60	2	2.00	0.02
Comb. L-T		0				0		
EB Thru	524	2	2.00	0.16	524	2	2.00	0.16
Comb. T-R		0				0		
EB Right	95	1	1.00	0.06	136	1	1.00	0.09
Comb. L-T-R		0				0		
WB Left	172	2	2.00	0.05	174	2	2.00	0.05
Comb. L-T		0				0		
WB Thru	587	2	2.00	0.18	590	2	2.00	0.18
Comb. T-R		0				0		
WB Right	38	1	1.00	0.02	59	1	1.00	0.04
Comb. L-T-R		0				0		
NB Left	65	1	1.00	0.04	65	1	1.00	0.04
Comb. L-T		0				0		
NB Thru	342	2	2.00	0.11	342	2	2.00	0.11
Comb. T-R		0				0		
NB Right	71	1	1.00	0.00	101	1	1.00	0.00
Comb. L-T-R		0				0		
SB Left	40	1	1.00	0.03	40	1	1.00	0.03
Comb. L-T		0				0		
SB Thru	405	1	1.72	0.15	405	1	1.72	0.15
Comb. T-R		1				1		
SB Right	65	0	0.28	0.15	65	0	0.28	0.15
Comb. L-T-R		0				0		

		PM Existing		PM Existing + Project
Critical Volumes	E-W:	0.22	E-W:	0.22
	N-S:	0.19	N-S:	0.19
	Total:	0.41	Total:	0.41
Lost Time		0.10		0.10
V/C		0.505		0.506
Level of Service		A		A

E-W Street: Union Valley Pkwy
N-S Street: Bradley Rd
Scenario: Sat Event Exit Pea Right Turn Reduce 30%
Lane Capacity: 1600
Dual Lefts Capacity (per lane): 1600

Movement	Sat Night Existing				Sat Night Existing + Project			
	Total Volume	No. of Lanes	Equivalent Lanes	Movement V/C	Total Volume	No. of Lanes	Equivalent Lanes	Movement V/C
EB Left	18	2	2.00	0.01	18	2	2.00	0.01
Comb. L-T		0				0		
EB Thru	147	2	2.00	0.05	150	2	2.00	0.05
Comb. T-R		0				0		
EB Right	31	1	1.00	0.02	44	1	1.00	0.03
Comb. L-T-R		0				0		
WB Left	65	2	2.00	0.02	83	2	2.00	0.03
Comb. L-T		0				0		
WB Thru	318	2	2.00	0.10	345	2	2.00	0.11
Comb. T-R		0				0		
WB Right	26	1	1.00	0.02	81	1	1.00	0.05
Comb. L-T-R		0				0		
NB Left	26	1	1.00	0.02	26	1	1.00	0.02
Comb. L-T		0				0		
NB Thru	211	2	2.00	0.07	211	2	2.00	0.07
Comb. T-R		0				0		
NB Right	36	1	1.00	0.00	54	1	1.00	0.00
Comb. L-T-R		0				0		
SB Left	44	1	1.00	0.03	48	1	1.00	0.03
Comb. L-T		0				0		
SB Thru	157	1	1.60	0.06	157	1	1.60	0.06
Comb. T-R		1				1		
SB Right	39	0	0.40	0.06	39	0	0.40	0.06
Comb. L-T-R		0				0		

Critical Volumes	E-W:	0.11	E-W:	0.11
	N-S:	0.09	N-S:	0.10
	Total:	0.20	Total:	0.21

Lost Time	0.10	0.10

V/C	0.298	0.309
Level of Service	A	A

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	490	0	4	255	0	0	0	0	3	0	484
Future Vol, veh/h	0	490	0	4	255	0	0	0	0	3	0	484
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Free
Storage Length	-	-	-	-	-	-	-	-	-	0	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	533	0	4	277	0	0	0	0	3	0	526

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	-	0	-	533	0	0	818	-	-
Stage 1	-	-	-	-	-	-	285	-	-
Stage 2	-	-	-	-	-	-	533	-	-
Critical Hdwy	-	-	-	4.12	-	-	6.42	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	5.42	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.42	-	-
Follow-up Hdwy	-	-	-	2.218	-	-	3.518	-	-
Pot Cap-1 Maneuver	0	-	0	1035	-	0	346	0	0
Stage 1	0	-	0	-	-	0	763	0	0
Stage 2	0	-	0	-	-	0	588	0	0
Platoon blocked, %		-			-				
Mov Cap-1 Maneuver	-	-	-	1035	-	-	344	0	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	344	0	-
Stage 1	-	-	-	-	-	-	759	0	-
Stage 2	-	-	-	-	-	-	588	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0.1	15.6
HCM LOS			C

Minor Lane/Major Mvmt	EBT	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	-	1035	-	344	-
HCM Lane V/C Ratio	-	0.004	-	0.009	-
HCM Control Delay (s)	-	8.5	0	15.6	0
HCM Lane LOS	-	A	A	C	A
HCM 95th %tile Q(veh)	-	0	-	0	-

Intersection	
Int Delay, s/veh	1.1

Movement	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER
Lane Configurations										
Traffic Vol, veh/h	10	14	0	171	7	15	0	308	0	0
Future Vol, veh/h	10	14	0	171	7	15	0	308	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	None	-	-	None	-	-
Storage Length	0	-	-	-	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	-	-	16979	-	16979	-
Grade, %	0	-	-	0	-	-	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	15	0	186	8	16	0	335	0	0

Major/Minor	Minor1		Major1		
Conflicting Flow All	190	190	-	0	0
Stage 1	190	-	-	-	-
Stage 2	0	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	-
Pot Cap-1 Maneuver	799	852	0	-	-
Stage 1	842	-	0	-	-
Stage 2	-	-	0	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	799	852	-	-	-
Mov Cap-2 Maneuver	799	-	-	-	-
Stage 1	842	-	-	-	-
Stage 2	-	-	-	-	-

Approach	WB	NB
HCM Control Delay, s	9.5	0
HCM LOS	A	

Minor Lane/Major Mvmt	NBT	NBR	WBLn1
Capacity (veh/h)	-	-	829
HCM Lane V/C Ratio	-	-	0.031
HCM Control Delay (s)	-	-	9.5
HCM Lane LOS	-	-	A
HCM 95th %tile Q(veh)	-	-	0.1

Intersection						
Int Delay, s/veh	6.6					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	25	21	5	3	2
Future Vol, veh/h	2	25	21	5	3	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	27	23	5	3	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	55	4	5	0	-	0
Stage 1	4	-	-	-	-	-
Stage 2	51	-	-	-	-	-
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	953	1080	1616	-	-	-
Stage 1	1019	-	-	-	-	-
Stage 2	971	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	940	1080	1616	-	-	-
Mov Cap-2 Maneuver	940	-	-	-	-	-
Stage 1	1005	-	-	-	-	-
Stage 2	971	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.5	5.9	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1616	-	1068	-	-
HCM Lane V/C Ratio	0.014	-	0.027	-	-
HCM Control Delay (s)	7.3	0	8.5	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	3.9

Movement	WBL	WBR	SEL	SET	NWT	NWR
Lane Configurations						
Traffic Vol, veh/h	0	2	2	3	1	0
Future Vol, veh/h	0	2	2	3	1	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	0	2	2	3	1	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	8	1	1	0	-	0
Stage 1	1	-	-	-	-	-
Stage 2	7	-	-	-	-	-
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	1013	1084	1622	-	-	-
Stage 1	1022	-	-	-	-	-
Stage 2	1016	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	1012	1084	1622	-	-	-
Mov Cap-2 Maneuver	1012	-	-	-	-	-
Stage 1	1021	-	-	-	-	-
Stage 2	1016	-	-	-	-	-

Approach	WB	SE	NW
HCM Control Delay, s	8.3	2.9	0
HCM LOS	A		

Minor Lane/Major Mvmt	NWT	NWR	WBLn1	SEL	SET
Capacity (veh/h)	-	-	1084	1622	-
HCM Lane V/C Ratio	-	-	0.002	0.001	-
HCM Control Delay (s)	-	-	8.3	7.2	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	4.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	932	107	2	90	0	0	0	0	1	4	659
Future Vol, veh/h	0	932	107	2	90	0	0	0	0	1	4	659
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	275	-	-	-	-	-	-	-	325
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1013	116	2	98	0	0	0	0	1	4	716

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	-	0	0	1129	0	0				1173	1231	98
Stage 1	-	-	-	-	-	-				102	102	-
Stage 2	-	-	-	-	-	-				1071	1129	-
Critical Hdwy	-	-	-	4.12	-	-				6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-				5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.42	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-				3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	619	-	0				212	177	958
Stage 1	0	-	-	-	-	0				922	811	-
Stage 2	0	-	-	-	-	0				329	279	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	619	-	-				211	0	958
Mov Cap-2 Maneuver	-	-	-	-	-	-				211	0	-
Stage 1	-	-	-	-	-	-				919	0	-
Stage 2	-	-	-	-	-	-				329	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0.2	11.6
HCM LOS			B

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	-	-	619	-	943	958
HCM Lane V/C Ratio	-	-	0.004	-	0.259	0.498
HCM Control Delay (s)	-	-	10.8	-	10.1	12.4
HCM Lane LOS	-	-	B	-	B	B
HCM 95th %tile Q(veh)	-	-	0	-	1	2.8

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	398	0	8	254	0	0	0	0	14	0	495
Future Vol, veh/h	0	398	0	8	254	0	0	0	0	14	0	495
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Free
Storage Length	-	-	-	-	-	-	-	-	-	0	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	433	0	9	276	0	0	0	0	15	0	538

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	-	0	-	433	0	0				727	-	-
Stage 1	-	-	-	-	-	-				294	-	-
Stage 2	-	-	-	-	-	-				433	-	-
Critical Hdwy	-	-	-	4.12	-	-				6.42	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-				5.42	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.42	-	-
Follow-up Hdwy	-	-	-	2.218	-	-				3.518	-	-
Pot Cap-1 Maneuver	0	-	0	1127	-	0				391	0	0
Stage 1	0	-	0	-	-	0				756	0	0
Stage 2	0	-	0	-	-	0				654	0	0
Platoon blocked, %		-			-							
Mov Cap-1 Maneuver	-	-	-	1127	-	-				387	0	-
Mov Cap-2 Maneuver	-	-	-	-	-	-				387	0	-
Stage 1	-	-	-	-	-	-				749	0	-
Stage 2	-	-	-	-	-	-				654	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0.3	14.7
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	-	1127	-	387	-
HCM Lane V/C Ratio	-	0.008	-	0.039	-
HCM Control Delay (s)	-	8.2	0	14.7	0
HCM Lane LOS	-	A	A	B	A
HCM 95th %tile Q(veh)	-	0	-	0.1	-

Intersection	
Int Delay, s/veh	3.3

Movement	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER
Lane Configurations										
Traffic Vol, veh/h	81	35	0	268	5	7	0	351	0	0
Future Vol, veh/h	81	35	0	268	5	7	0	351	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	None	-	-	None	-	-
Storage Length	0	-	-	-	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	-	-	16979	-	16979	-
Grade, %	0	-	-	0	-	-	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	88	38	0	291	5	8	0	382	0	0

Major/Minor	Minor1		Major1		
Conflicting Flow All	294	294	-	0	0
Stage 1	294	-	-	-	-
Stage 2	0	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	-
Pot Cap-1 Maneuver	697	745	0	-	-
Stage 1	756	-	0	-	-
Stage 2	-	-	0	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	697	745	-	-	-
Mov Cap-2 Maneuver	697	-	-	-	-
Stage 1	756	-	-	-	-
Stage 2	-	-	-	-	-

Approach	WB	NB
HCM Control Delay, s	11.2	0
HCM LOS	B	

Minor Lane/Major Mvmt	NBT	NBR	WBLn1
Capacity (veh/h)	-	-	711
HCM Lane V/C Ratio	-	-	0.177
HCM Control Delay (s)	-	-	11.2
HCM Lane LOS	-	-	B
HCM 95th %tile Q(veh)	-	-	0.6

Intersection						
Int Delay, s/veh	6.6					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	8	100	0	0	16
Future Vol, veh/h	4	8	100	0	0	16
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	4	9	109	0	0	17

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	227	9	17	0	-	0
Stage 1	9	-	-	-	-	-
Stage 2	218	-	-	-	-	-
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	761	1073	1600	-	-	-
Stage 1	1014	-	-	-	-	-
Stage 2	818	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	709	1073	1600	-	-	-
Mov Cap-2 Maneuver	709	-	-	-	-	-
Stage 1	945	-	-	-	-	-
Stage 2	818	-	-	-	-	-

Approach	EB		NB		SB	
HCM Control Delay, s	9		7.4		0	
HCM LOS	A					

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1600	-	916	-	-
HCM Lane V/C Ratio	0.068	-	0.014	-	-
HCM Control Delay (s)	7.4	0	9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.2	-	0	-	-

Intersection	
Int Delay, s/veh	3.7

Movement	WBL	WBR	SEL	SET	NWT	NWR
Lane Configurations						
Traffic Vol, veh/h	0	4	1	0	6	0
Future Vol, veh/h	0	4	1	0	6	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	0	4	1	0	7	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	9	7	7	0	-	0
Stage 1	7	-	-	-	-	-
Stage 2	2	-	-	-	-	-
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	1011	1075	1614	-	-	-
Stage 1	1016	-	-	-	-	-
Stage 2	1021	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	1010	1075	1614	-	-	-
Mov Cap-2 Maneuver	1010	-	-	-	-	-
Stage 1	1015	-	-	-	-	-
Stage 2	1021	-	-	-	-	-

Approach	WB	SE	NW
HCM Control Delay, s	8.4	7.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NWT	NWR	WBLn1	SEL	SET
Capacity (veh/h)	-	-	1075	1614	-
HCM Lane V/C Ratio	-	-	0.004	0.001	-
HCM Control Delay (s)	-	-	8.4	7.2	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

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	0	729	55	3	109	0	0	0	0	2	2	819
Future Vol, veh/h	0	729	55	3	109	0	0	0	0	2	2	819
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	275	-	-	-	-	-	-	-	325
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	792	60	3	118	0	0	0	0	2	2	890

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	-	0	0	852	0	0				946	976	118
Stage 1	-	-	-	-	-	-				124	124	-
Stage 2	-	-	-	-	-	-				822	852	-
Critical Hdwy	-	-	-	4.12	-	-				6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-				5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.42	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-				3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	787	-	0				290	251	934
Stage 1	0	-	-	-	-	0				902	793	-
Stage 2	0	-	-	-	-	0				432	376	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	787	-	-				289	0	934
Mov Cap-2 Maneuver	-	-	-	-	-	-				289	0	-
Stage 1	-	-	-	-	-	-				898	0	-
Stage 2	-	-	-	-	-	-				432	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0.3	13.8
HCM LOS			B

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	-	-	787	-	919	934
HCM Lane V/C Ratio	-	-	0.004	-	0.328	0.635
HCM Control Delay (s)	-	-	9.6	-	10.8	15.3
HCM Lane LOS	-	-	A	-	B	C
HCM 95th %tile Q(veh)	-	-	0	-	1.4	4.7

Intersection	
Int Delay, s/veh	6.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	139	0	277	696	0	0	0	0	51	0	161
Future Vol, veh/h	0	139	0	277	696	0	0	0	0	51	0	161
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Free
Storage Length	-	-	-	-	-	-	-	-	-	0	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	151	0	301	757	0	0	0	0	55	0	175

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	-	0	-	151	0	0	1510	-	-
Stage 1	-	-	-	-	-	-	1359	-	-
Stage 2	-	-	-	-	-	-	151	-	-
Critical Hdwy	-	-	-	4.12	-	-	6.42	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	5.42	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.42	-	-
Follow-up Hdwy	-	-	-	2.218	-	-	3.518	-	-
Pot Cap-1 Maneuver	0	-	0	1430	-	0	133	0	0
Stage 1	0	-	0	-	-	0	239	0	0
Stage 2	0	-	0	-	-	0	877	0	0
Platoon blocked, %		-			-				
Mov Cap-1 Maneuver	-	-	-	1430	-	-	85	0	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	85	0	-
Stage 1	-	-	-	-	-	-	152	0	-
Stage 2	-	-	-	-	-	-	877	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	2.3	105.3
HCM LOS			F

Minor Lane/Major Mvmt	EBT	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	-	1430	-	85	-
HCM Lane V/C Ratio	-	0.211	-	0.652	-
HCM Control Delay (s)	-	8.2	0	105.3	0
HCM Lane LOS	-	A	A	F	A
HCM 95th %tile Q(veh)	-	0.8	-	3.1	-

Intersection	
Int Delay, s/veh	51

Movement	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER
Lane Configurations										
Traffic Vol, veh/h	7	881	0	93	23	65	0	116	0	0
Future Vol, veh/h	7	881	0	93	23	65	0	116	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	None	-	-	None	-	-
Storage Length	0	-	-	-	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	-	-	16979	-	16979	-
Grade, %	0	-	-	0	-	-	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	958	0	101	25	71	0	126	0	0

Major/Minor	Minor1		Major1		
Conflicting Flow All	114	114	-	0	0
Stage 1	114	-	-	-	-
Stage 2	0	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	-
Pot Cap-1 Maneuver	882	~ 939	0	-	-
Stage 1	911	-	0	-	-
Stage 2	-	-	0	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	882	~ 939	-	-	-
Mov Cap-2 Maneuver	882	-	-	-	-
Stage 1	911	-	-	-	-
Stage 2	-	-	-	-	-

Approach	WB	NB
HCM Control Delay, s	57.7	0
HCM LOS	F	

Minor Lane/Major Mvmt	NBT	NBR	WBLn1
Capacity (veh/h)	-	-	939
HCM Lane V/C Ratio	-	-	1.028
HCM Control Delay (s)	-	-	57.7
HCM Lane LOS	-	-	F
HCM 95th %tile Q(veh)	-	-	20.7

Notes

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

Intersection						
Int Delay, s/veh	10.2					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	88	888	0	0	0
Future Vol, veh/h	0	88	888	0	0	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	0	96	965	0	0	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1931	1	1	0	-	0
Stage 1	1	-	-	-	-	-
Stage 2	1930	-	-	-	-	-
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	73	1084	1622	-	-	-
Stage 1	1022	-	-	-	-	-
Stage 2	124	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	30	1084	1622	-	-	-
Mov Cap-2 Maneuver	30	-	-	-	-	-
Stage 1	414	-	-	-	-	-
Stage 2	124	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.6	10.4	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1622	-	1084	-	-
HCM Lane V/C Ratio	0.595	-	0.088	-	-
HCM Control Delay (s)	10.4	0	8.6	-	-
HCM Lane LOS	B	A	A	-	-
HCM 95th %tile Q(veh)	4.2	-	0.3	-	-

Intersection	
Int Delay, s/veh	18.3

Movement	WBL	WBR	SEL	SET	NWT	NWR
Lane Configurations						
Traffic Vol, veh/h	1	436	40	49	496	0
Future Vol, veh/h	1	436	40	49	496	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	1	474	43	53	539	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	678	539	539	0	-	0
Stage 1	539	-	-	-	-	-
Stage 2	139	-	-	-	-	-
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	418	542	1029	-	-	-
Stage 1	585	-	-	-	-	-
Stage 2	888	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	400	542	1029	-	-	-
Mov Cap-2 Maneuver	400	-	-	-	-	-
Stage 1	560	-	-	-	-	-
Stage 2	888	-	-	-	-	-

Approach	WB	SE	NW
HCM Control Delay, s	42.1	3.9	0
HCM LOS	E		

Minor Lane/Major Mvmt	NWT	NWR	WBLn1	SEL	SET
Capacity (veh/h)	-	-	542	1029	-
HCM Lane V/C Ratio	-	-	0.876	0.042	-
HCM Control Delay (s)	-	-	42.1	8.7	0
HCM Lane LOS	-	-	E	A	A
HCM 95th %tile Q(veh)	-	-	9.8	0.1	-

Intersection	
Int Delay, s/veh	6.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	235	17	2	44	0	0	0	0	36	3	455
Future Vol, veh/h	0	235	17	2	44	0	0	0	0	36	3	455
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	275	-	-	-	-	-	-	-	325
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	255	18	2	48	0	0	0	0	39	3	495

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	-	0	0	273	0	0				316	325	48
Stage 1	-	-	-	-	-	-				52	52	-
Stage 2	-	-	-	-	-	-				264	273	-
Critical Hdwy	-	-	-	4.12	-	-				6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-				5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.42	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-				3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	1290	-	0				677	593	1021
Stage 1	0	-	-	-	-	0				970	852	-
Stage 2	0	-	-	-	-	0				780	684	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	1290	-	-				676	0	1021
Mov Cap-2 Maneuver	-	-	-	-	-	-				676	0	-
Stage 1	-	-	-	-	-	-				968	0	-
Stage 2	-	-	-	-	-	-				780	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0.3	10.1
HCM LOS			B

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	-	-	1290	-	930	1021
HCM Lane V/C Ratio	-	-	0.002	-	0.223	0.323
HCM Control Delay (s)	-	-	7.8	-	10	10.2
HCM Lane LOS	-	-	A	-	B	B
HCM 95th %tile Q(veh)	-	-	0	-	0.9	1.4

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	486	0	2	252	0	0	0	0	3	0	484
Future Vol, veh/h	0	486	0	2	252	0	0	0	0	3	0	484
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Free
Storage Length	-	-	-	-	-	-	-	-	-	0	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	528	0	2	274	0	0	0	0	3	0	526

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	-	0	-	528	0	0				806	-	-
Stage 1	-	-	-	-	-	-				278	-	-
Stage 2	-	-	-	-	-	-				528	-	-
Critical Hdwy	-	-	-	4.12	-	-				6.42	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-				5.42	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.42	-	-
Follow-up Hdwy	-	-	-	2.218	-	-				3.518	-	-
Pot Cap-1 Maneuver	0	-	0	1039	-	0				351	0	0
Stage 1	0	-	0	-	-	0				769	0	0
Stage 2	0	-	0	-	-	0				592	0	0
Platoon blocked, %		-			-							
Mov Cap-1 Maneuver	-	-	-	1039	-	-				350	0	-
Mov Cap-2 Maneuver	-	-	-	-	-	-				350	0	-
Stage 1	-	-	-	-	-	-				767	0	-
Stage 2	-	-	-	-	-	-				592	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0.1	15.4
HCM LOS			C

Minor Lane/Major Mvmt	EBT	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	-	1039	-	350	-
HCM Lane V/C Ratio	-	0.002	-	0.009	-
HCM Control Delay (s)	-	8.5	0	15.4	0
HCM Lane LOS	-	A	A	C	A
HCM 95th %tile Q(veh)	-	0	-	0	-

Intersection	
Int Delay, s/veh	1.1

Movement	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER
Lane Configurations										
Traffic Vol, veh/h	10	14	0	171	5	11	0	308	0	0
Future Vol, veh/h	10	14	0	171	5	11	0	308	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	None	-	-	None	-	-
Storage Length	0	-	-	-	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	-	-	16979	-	16979	-
Grade, %	0	-	-	0	-	-	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	15	0	186	5	12	0	335	0	0

Major/Minor	Minor1		Major1		
Conflicting Flow All	189	189	-	0	0
Stage 1	189	-	-	-	-
Stage 2	0	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	-
Pot Cap-1 Maneuver	800	853	0	-	-
Stage 1	843	-	0	-	-
Stage 2	-	-	0	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	800	853	-	-	-
Mov Cap-2 Maneuver	800	-	-	-	-
Stage 1	843	-	-	-	-
Stage 2	-	-	-	-	-

Approach	WB	NB
HCM Control Delay, s	9.5	0
HCM LOS	A	

Minor Lane/Major Mvmt	NBT	NBR	WBLn1
Capacity (veh/h)	-	-	830
HCM Lane V/C Ratio	-	-	0.031
HCM Control Delay (s)	-	-	9.5
HCM Lane LOS	-	-	A
HCM 95th %tile Q(veh)	-	-	0.1

Intersection						
Int Delay, s/veh	6.4					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	19	21	5	3	2
Future Vol, veh/h	2	19	21	5	3	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	21	23	5	3	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	55	4	5	0	-	0
Stage 1	4	-	-	-	-	-
Stage 2	51	-	-	-	-	-
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	953	1080	1616	-	-	-
Stage 1	1019	-	-	-	-	-
Stage 2	971	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	940	1080	1616	-	-	-
Mov Cap-2 Maneuver	940	-	-	-	-	-
Stage 1	1005	-	-	-	-	-
Stage 2	971	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.5	5.9	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1616	-	1065	-	-
HCM Lane V/C Ratio	0.014	-	0.021	-	-
HCM Control Delay (s)	7.3	0	8.5	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection						
Int Delay, s/veh	1.8					

Movement	WBL	WBR	SEL	SET	NWT	NWR
Lane Configurations						
Traffic Vol, veh/h	0	2	2	7	6	0
Future Vol, veh/h	0	2	2	7	6	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	0	2	2	8	7	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	19	7	7	0	-	0
Stage 1	7	-	-	-	-	-
Stage 2	12	-	-	-	-	-
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	998	1075	1614	-	-	-
Stage 1	1016	-	-	-	-	-
Stage 2	1011	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	997	1075	1614	-	-	-
Mov Cap-2 Maneuver	997	-	-	-	-	-
Stage 1	1015	-	-	-	-	-
Stage 2	1011	-	-	-	-	-

Approach	WB	SE	NW
HCM Control Delay, s	8.4	1.6	0
HCM LOS	A		

Minor Lane/Major Mvmt	NWT	NWR	WBLn1	SEL	SET
Capacity (veh/h)	-	-	1075	1614	-
HCM Lane V/C Ratio	-	-	0.002	0.001	-
HCM Control Delay (s)	-	-	8.4	7.2	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR	NWL	NWR
Lane Configurations								
Traffic Vol, veh/h	3	0	1	2	0	0	92	1
Future Vol, veh/h	3	0	1	2	0	0	92	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	-	-	None	-	-	-	None
Storage Length	-	-	200	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	16974	-	0	-
Grade, %	0	-	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2
Mvmt Flow	3	0	1	2	0	0	100	1

Major/Minor	Major1		Major2				Minor1	
Conflicting Flow All	0	0	1013	0			4	0
Stage 1	-	-	-	-			0	-
Stage 2	-	-	-	-			4	-
Critical Hdwy	-	-	4.12	-			6.42	6.22
Critical Hdwy Stg 1	-	-	-	-			-	-
Critical Hdwy Stg 2	-	-	-	-			5.42	-
Follow-up Hdwy	-	-	2.218	-			3.518	3.318
Pot Cap-1 Maneuver	-	-	684	-			1018	-
Stage 1	-	-	-	-			-	-
Stage 2	-	-	-	-			1019	-
Platoon blocked, %	-	-		-				
Mov Cap-1 Maneuver	-	-	684	-			1015	-
Mov Cap-2 Maneuver	-	-	-	-			1015	-
Stage 1	-	-	-	-			-	-
Stage 2	-	-	-	-			1019	-

Approach	EB	WB	NW
HCM Control Delay, s	0	3.4	
HCM LOS			-

Minor Lane/Major Mvmt	NWLn1	EBT	EBR	EBR2	WBL	WBT
Capacity (veh/h)	-	1620	-	-	684	-
HCM Lane V/C Ratio	-	0.002	-	-	0.002	-
HCM Control Delay (s)	-	7.2	-	-	10.3	-
HCM Lane LOS	-	A	-	-	B	-
HCM 95th %tile Q(veh)	-	0	-	-	0	-

Intersection	
Int Delay, s/veh	4.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	935	107	2	92	0	0	0	0	1	4	659
Future Vol, veh/h	0	935	107	2	92	0	0	0	0	1	4	659
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	275	-	-	-	-	-	-	-	325
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1016	116	2	100	0	0	0	0	1	4	716

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	-	0	0	1132	0	0				1178	1236	100
Stage 1	-	-	-	-	-	-				104	104	-
Stage 2	-	-	-	-	-	-				1074	1132	-
Critical Hdwy	-	-	-	4.12	-	-				6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-				5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.42	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-				3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	617	-	0				211	176	956
Stage 1	0	-	-	-	-	0				920	809	-
Stage 2	0	-	-	-	-	0				328	278	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	617	-	-				210	0	956
Mov Cap-2 Maneuver	-	-	-	-	-	-				210	0	-
Stage 1	-	-	-	-	-	-				917	0	-
Stage 2	-	-	-	-	-	-				328	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0.2	11.7
HCM LOS			B

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	-	-	617	-	941	956
HCM Lane V/C Ratio	-	-	0.004	-	0.26	0.5
HCM Control Delay (s)	-	-	10.9	-	10.2	12.5
HCM Lane LOS	-	-	B	-	B	B
HCM 95th %tile Q(veh)	-	-	0	-	1	2.9

Intersection						
Int Delay, s/veh	4.9					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	0	0	0	0	3
Future Vol, veh/h	4	0	0	0	0	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	4	0	0	0	0	3

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2	2	3	0	-	0
Stage 1	2	-	-	-	-	-
Stage 2	0	-	-	-	-	-
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	1021	1082	1619	-	-	-
Stage 1	1021	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	1021	1082	1619	-	-	-
Mov Cap-2 Maneuver	1021	-	-	-	-	-
Stage 1	1021	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.5	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1619	-	1021	-	-
HCM Lane V/C Ratio	-	-	0.004	-	-
HCM Control Delay (s)	0	-	8.5	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	397	0	0	239	0	0	0	0	14	0	495
Future Vol, veh/h	0	397	0	0	239	0	0	0	0	14	0	495
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Free
Storage Length	-	-	-	-	-	-	-	-	-	0	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	432	0	0	260	0	0	0	0	15	0	538

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	-	0	-	432	0	0	692	-	-
Stage 1	-	-	-	-	-	-	260	-	-
Stage 2	-	-	-	-	-	-	432	-	-
Critical Hdwy	-	-	-	4.12	-	-	6.42	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	5.42	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.42	-	-
Follow-up Hdwy	-	-	-	2.218	-	-	3.518	-	-
Pot Cap-1 Maneuver	0	-	0	1128	-	0	410	0	0
Stage 1	0	-	0	-	-	0	783	0	0
Stage 2	0	-	0	-	-	0	655	0	0
Platoon blocked, %		-			-				
Mov Cap-1 Maneuver	-	-	-	1128	-	-	410	0	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	410	0	-
Stage 1	-	-	-	-	-	-	783	0	-
Stage 2	-	-	-	-	-	-	655	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	14.1
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	-	1128	-	410	-
HCM Lane V/C Ratio	-	-	-	0.037	-
HCM Control Delay (s)	-	0	-	14.1	0
HCM Lane LOS	-	A	-	B	A
HCM 95th %tile Q(veh)	-	0	-	0.1	-

Intersection	
Int Delay, s/veh	3.3

Movement	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER
Lane Configurations										
Traffic Vol, veh/h	81	35	0	268	4	6	0	351	0	0
Future Vol, veh/h	81	35	0	268	4	6	0	351	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	None	-	-	None	-	-
Storage Length	0	-	-	-	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	-	-	16979	-	16979	-
Grade, %	0	-	-	0	-	-	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	88	38	0	291	4	7	0	382	0	0

Major/Minor	Minor1		Major1		
Conflicting Flow All	293	293	-	0	0
Stage 1	293	-	-	-	-
Stage 2	0	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	-
Pot Cap-1 Maneuver	698	746	0	-	-
Stage 1	757	-	0	-	-
Stage 2	-	-	0	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	698	746	-	-	-
Mov Cap-2 Maneuver	698	-	-	-	-
Stage 1	757	-	-	-	-
Stage 2	-	-	-	-	-

Approach	WB	NB
HCM Control Delay, s	11.1	0
HCM LOS	B	

Minor Lane/Major Mvmt	NBT	NBR	WBLn1
Capacity (veh/h)	-	-	712
HCM Lane V/C Ratio	-	-	0.177
HCM Control Delay (s)	-	-	11.1
HCM Lane LOS	-	-	B
HCM 95th %tile Q(veh)	-	-	0.6

Intersection	
Int Delay, s/veh	6.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	6	100	0	0	16
Future Vol, veh/h	4	6	100	0	0	16
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	4	7	109	0	0	17

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	227	9	17	0	-	0
Stage 1	9	-	-	-	-	-
Stage 2	218	-	-	-	-	-
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	761	1073	1600	-	-	-
Stage 1	1014	-	-	-	-	-
Stage 2	818	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	709	1073	1600	-	-	-
Mov Cap-2 Maneuver	709	-	-	-	-	-
Stage 1	945	-	-	-	-	-
Stage 2	818	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.1	7.4	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1600	-	890	-	-
HCM Lane V/C Ratio	0.068	-	0.012	-	-
HCM Control Delay (s)	7.4	0	9.1	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.2	-	0	-	-

Intersection						
Int Delay, s/veh	1.1					

Movement	WBL	WBR	SEL	SET	NWT	NWR
Lane Configurations						
Traffic Vol, veh/h	0	4	1	23	8	0
Future Vol, veh/h	0	4	1	23	8	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	0	4	1	25	9	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	36	9	9	0	-	0
Stage 1	9	-	-	-	-	-
Stage 2	27	-	-	-	-	-
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	977	1073	1611	-	-	-
Stage 1	1014	-	-	-	-	-
Stage 2	996	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	976	1073	1611	-	-	-
Mov Cap-2 Maneuver	976	-	-	-	-	-
Stage 1	1013	-	-	-	-	-
Stage 2	996	-	-	-	-	-

Approach	WB	SE	NW
HCM Control Delay, s	8.4	0.3	0
HCM LOS	A		

Minor Lane/Major Mvmt	NWT	NWR	WBLn1	SEL	SET
Capacity (veh/h)	-	-	1073	1611	-
HCM Lane V/C Ratio	-	-	0.004	0.001	-
HCM Control Delay (s)	-	-	8.4	7.2	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR	NWL	NWR
Lane Configurations								
Traffic Vol, veh/h	1	0	5	10	0	0	112	0
Future Vol, veh/h	1	0	5	10	0	0	112	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	-	-	None	-	-	-	None
Storage Length	-	-	200	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	16974	-	0	-
Grade, %	0	-	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	5	11	0	0	122	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	795	0	21	0
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	21	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	826	-	996	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	1002	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	826	-	989	-
Mov Cap-2 Maneuver	-	-	-	-	989	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	1002	-

Approach	EB	WB	NW
HCM Control Delay, s	0	3.1	
HCM LOS			-

Minor Lane/Major Mvmt	NWLn1	EBT	EBR	EBR2	WBL	WBT
Capacity (veh/h)	-	1608	-	-	826	-
HCM Lane V/C Ratio	-	0.001	-	-	0.007	-
HCM Control Delay (s)	-	7.2	-	-	9.4	-
HCM Lane LOS	-	A	-	-	A	-
HCM 95th %tile Q(veh)	-	0	-	-	0	-

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	0	730	55	3	119	0	0	0	0	2	2	819
Future Vol, veh/h	0	730	55	3	119	0	0	0	0	2	2	819
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	275	-	-	-	-	-	-	-	325
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	793	60	3	129	0	0	0	0	2	2	890

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	-	0	0	853	0	0				958	988	129
Stage 1	-	-	-	-	-	-				135	135	-
Stage 2	-	-	-	-	-	-				823	853	-
Critical Hdwy	-	-	-	4.12	-	-				6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-				5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.42	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-				3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	786	-	0				285	247	921
Stage 1	0	-	-	-	-	0				891	785	-
Stage 2	0	-	-	-	-	0				431	376	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	786	-	-				284	0	921
Mov Cap-2 Maneuver	-	-	-	-	-	-				284	0	-
Stage 1	-	-	-	-	-	-				887	0	-
Stage 2	-	-	-	-	-	-				431	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0.2	14.1
HCM LOS			B

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	-	-	786	-	906	921
HCM Lane V/C Ratio	-	-	0.004	-	0.332	0.644
HCM Control Delay (s)	-	-	9.6	-	10.9	15.7
HCM Lane LOS	-	-	A	-	B	C
HCM 95th %tile Q(veh)	-	-	0	-	1.5	4.9

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	0	0	0	0	15
Future Vol, veh/h	1	0	0	0	0	15
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	0	0	0	0	16

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	8	8	16	0	-	0
Stage 1	8	-	-	-	-	-
Stage 2	0	-	-	-	-	-
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	1013	1074	1602	-	-	-
Stage 1	1015	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	1013	1074	1602	-	-	-
Mov Cap-2 Maneuver	1013	-	-	-	-	-
Stage 1	1015	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.6	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1602	-	1013	-	-
HCM Lane V/C Ratio	-	-	0.001	-	-
HCM Control Delay (s)	0	-	8.6	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	130	0	46	607	0	0	0	0	51	0	161
Future Vol, veh/h	0	130	0	46	607	0	0	0	0	51	0	161
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Free
Storage Length	-	-	-	-	-	-	-	-	-	0	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	141	0	50	660	0	0	0	0	55	0	175

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	-	0	-	141	0	0	901	-	-
Stage 1	-	-	-	-	-	-	760	-	-
Stage 2	-	-	-	-	-	-	141	-	-
Critical Hdwy	-	-	-	4.12	-	-	6.42	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	5.42	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.42	-	-
Follow-up Hdwy	-	-	-	2.218	-	-	3.518	-	-
Pot Cap-1 Maneuver	0	-	0	1442	-	0	309	0	0
Stage 1	0	-	0	-	-	0	462	0	0
Stage 2	0	-	0	-	-	0	886	0	0
Platoon blocked, %		-			-				
Mov Cap-1 Maneuver	-	-	-	1442	-	-	292	0	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	292	0	-
Stage 1	-	-	-	-	-	-	437	0	-
Stage 2	-	-	-	-	-	-	886	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0.5	20.2
HCM LOS			C

Minor Lane/Major Mvmt	EBT	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	-	1442	-	292	-
HCM Lane V/C Ratio	-	0.035	-	0.19	-
HCM Control Delay (s)	-	7.6	0	20.2	0
HCM Lane LOS	-	A	A	C	A
HCM 95th %tile Q(veh)	-	0.1	-	0.7	-

Intersection	
Int Delay, s/veh	13.2

Movement	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER
Lane Configurations										
Traffic Vol, veh/h	7	561	0	93	0	56	0	116	0	0
Future Vol, veh/h	7	561	0	93	0	56	0	116	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	None	-	-	None	-	-
Storage Length	0	-	-	-	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	-	-	16979	-	16979	-
Grade, %	0	-	-	0	-	-	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	610	0	101	0	61	0	126	0	0

Major/Minor	Minor1		Major1		
Conflicting Flow All	101	101	-	0	0
Stage 1	101	-	-	-	-
Stage 2	0	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	-
Pot Cap-1 Maneuver	898	954	0	-	-
Stage 1	923	-	0	-	-
Stage 2	-	-	0	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	898	954	-	-	-
Mov Cap-2 Maneuver	898	-	-	-	-
Stage 1	923	-	-	-	-
Stage 2	-	-	-	-	-

Approach	WB	NB
HCM Control Delay, s	15.4	0
HCM LOS	C	

Minor Lane/Major Mvmt	NBT	NBR	WBLn1
Capacity (veh/h)	-	-	953
HCM Lane V/C Ratio	-	-	0.648
HCM Control Delay (s)	-	-	15.4
HCM Lane LOS	-	-	C
HCM 95th %tile Q(veh)	-	-	4.9

Intersection						
Int Delay, s/veh	8.6					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	56	568	0	0	0
Future Vol, veh/h	0	56	568	0	0	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	0	61	617	0	0	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1235	1	1	0	-	0
Stage 1	1	-	-	-	-	-
Stage 2	1234	-	-	-	-	-
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	195	1084	1622	-	-	-
Stage 1	1022	-	-	-	-	-
Stage 2	275	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	121	1084	1622	-	-	-
Mov Cap-2 Maneuver	121	-	-	-	-	-
Stage 1	634	-	-	-	-	-
Stage 2	275	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.5	8.6	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1622	-	1084	-	-
HCM Lane V/C Ratio	0.381	-	0.056	-	-
HCM Control Delay (s)	8.6	0	8.5	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	1.8	-	0.2	-	-

Intersection						
Int Delay, s/veh	57.2					

Movement	WBL	WBR	SEL	SET	NWT	NWR
Lane Configurations						
Traffic Vol, veh/h	321	292	28	32	320	32
Future Vol, veh/h	321	292	28	32	320	32
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	349	317	30	35	348	35

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	461	366	383	0	-	0
Stage 1	366	-	-	-	-	-
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	559	679	1175	-	-	-
Stage 1	702	-	-	-	-	-
Stage 2	929	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	544	679	1175	-	-	-
Mov Cap-2 Maneuver	544	-	-	-	-	-
Stage 1	684	-	-	-	-	-
Stage 2	929	-	-	-	-	-

Approach	WB	SE	NW
HCM Control Delay, s	95.3	3.8	0
HCM LOS	F		

Minor Lane/Major Mvmt	NWT	NWR	WBLn1	SEL	SET
Capacity (veh/h)	-	-	601	1175	-
HCM Lane V/C Ratio	-	-	1.109	0.026	-
HCM Control Delay (s)	-	-	95.3	8.1	0
HCM Lane LOS	-	-	F	A	A
HCM 95th %tile Q(veh)	-	-	20.4	0.1	-

Intersection								
Int Delay, s/veh	2.8							

Movement	EBT	EBR	WBL	WBT	NBL	NBR	NWL	NWR
Lane Configurations								
Traffic Vol, veh/h	18	0	208	120	0	0	39	21
Future Vol, veh/h	18	0	208	120	0	0	39	21
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	-	-	None	-	-	-	None
Storage Length	-	-	200	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	16974	-	0	-
Grade, %	0	-	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2
Mvmt Flow	20	0	226	130	0	0	42	23

Major/Minor	Major1		Major2				Minor1	
Conflicting Flow All	0	0	286	0			582	0
Stage 1	-	-	-	-			0	-
Stage 2	-	-	-	-			582	-
Critical Hdwy	-	-	4.12	-			6.42	6.22
Critical Hdwy Stg 1	-	-	-	-			-	-
Critical Hdwy Stg 2	-	-	-	-			5.42	-
Follow-up Hdwy	-	-	2.218	-			3.518	3.318
Pot Cap-1 Maneuver	-	-	1276	-			475	-
Stage 1	-	-	-	-			-	-
Stage 2	-	-	-	-			559	-
Platoon blocked, %	-	-		-				
Mov Cap-1 Maneuver	-	-	1276	-			385	-
Mov Cap-2 Maneuver	-	-	-	-			385	-
Stage 1	-	-	-	-			-	-
Stage 2	-	-	-	-			559	-

Approach	EB	WB	NW
HCM Control Delay, s	0.5	5.3	
HCM LOS			-

Minor Lane/Major Mvmt	NWLn1	EBT	EBR	EBR2	WBL	WBT
Capacity (veh/h)	-	1455	-	-	1276	-
HCM Lane V/C Ratio	-	0.013	-	-	0.177	-
HCM Control Delay (s)	-	7.5	-	-	8.4	-
HCM Lane LOS	-	A	-	-	A	-
HCM 95th %tile Q(veh)	-	0	-	-	0.6	-

Intersection	
Int Delay, s/veh	6.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	244	17	2	159	0	0	0	0	36	3	455
Future Vol, veh/h	0	244	17	2	159	0	0	0	0	36	3	455
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	275	-	-	-	-	-	-	-	325
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	265	18	2	173	0	0	0	0	39	3	495

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	-	0	0	283	0	0				451	460	173
Stage 1	-	-	-	-	-	-				177	177	-
Stage 2	-	-	-	-	-	-				274	283	-
Critical Hdwy	-	-	-	4.12	-	-				6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-				5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.42	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-				3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	1279	-	0				566	498	871
Stage 1	0	-	-	-	-	0				854	753	-
Stage 2	0	-	-	-	-	0				772	677	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	1279	-	-				565	0	871
Mov Cap-2 Maneuver	-	-	-	-	-	-				565	0	-
Stage 1	-	-	-	-	-	-				852	0	-
Stage 2	-	-	-	-	-	-				772	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0.1	11.4
HCM LOS			B

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	-	-	1279	-	789	871
HCM Lane V/C Ratio	-	-	0.002	-	0.263	0.379
HCM Control Delay (s)	-	-	7.8	-	11.2	11.6
HCM Lane LOS	-	-	A	-	B	B
HCM 95th %tile Q(veh)	-	-	0	-	1.1	1.8

Intersection						
Int Delay, s/veh	0.9					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	32	0	0	0	0	320
Future Vol, veh/h	32	0	0	0	0	320
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	35	0	0	0	0	348

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	174	174	348	0	-	0
Stage 1	174	-	-	-	-	-
Stage 2	0	-	-	-	-	-
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	816	869	1211	-	-	-
Stage 1	856	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	816	869	1211	-	-	-
Mov Cap-2 Maneuver	816	-	-	-	-	-
Stage 1	856	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.6	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1211	-	816	-	-
HCM Lane V/C Ratio	-	-	0.043	-	-
HCM Control Delay (s)	0	-	9.6	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	490	0	4	255	0	0	0	0	3	0	484
Future Vol, veh/h	0	490	0	4	255	0	0	0	0	3	0	484
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Free
Storage Length	-	-	-	-	-	-	-	-	-	0	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	533	0	4	277	0	0	0	0	3	0	526

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	-	0	-	533	0	0	818	-	-
Stage 1	-	-	-	-	-	-	285	-	-
Stage 2	-	-	-	-	-	-	533	-	-
Critical Hdwy	-	-	-	4.12	-	-	6.42	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	5.42	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.42	-	-
Follow-up Hdwy	-	-	-	2.218	-	-	3.518	-	-
Pot Cap-1 Maneuver	0	-	0	1035	-	0	346	0	0
Stage 1	0	-	0	-	-	0	763	0	0
Stage 2	0	-	0	-	-	0	588	0	0
Platoon blocked, %		-			-				
Mov Cap-1 Maneuver	-	-	-	1035	-	-	344	0	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	344	0	-
Stage 1	-	-	-	-	-	-	759	0	-
Stage 2	-	-	-	-	-	-	588	0	-

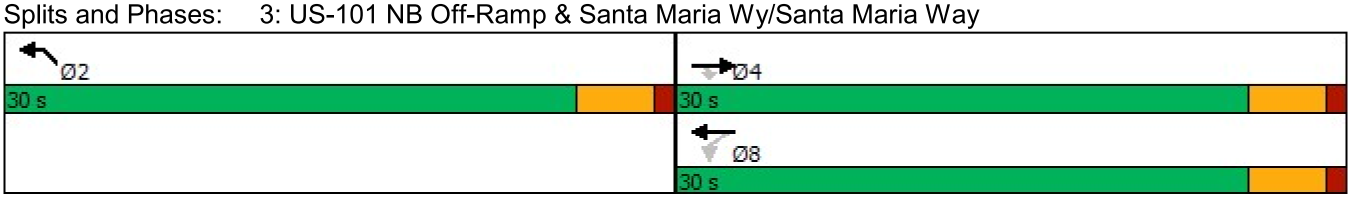
Approach	EB	WB	SB
HCM Control Delay, s	0	0.1	15.6
HCM LOS			C

Minor Lane/Major Mvmt	EBT	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	-	1035	-	344	-
HCM Lane V/C Ratio	-	0.004	-	0.009	-
HCM Control Delay (s)	-	8.5	0	15.6	0
HCM Lane LOS	-	A	A	C	A
HCM 95th %tile Q(veh)	-	0	-	0	-

Lane Group	EBT	EBR2	WBL	WBT	NWL
Lane Configurations					
Traffic Volume (vph)	15	308	10	14	171
Future Volume (vph)	15	308	10	14	171
Turn Type	NA	Perm	Perm	NA	Prot
Protected Phases	4			8	2
Permitted Phases		4	8		
Detector Phase	4	4	8	8	2
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5
Total Split (s)	30.0	30.0	30.0	30.0	30.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	None	None	Min
Act Effct Green (s)	6.8	6.8	6.8	6.8	8.9
Actuated g/C Ratio	0.27	0.27	0.27	0.27	0.36
v/c Ratio	0.03	0.50	0.03	0.03	0.30
Control Delay	6.5	4.0	6.6	6.5	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	6.5	4.0	6.6	6.5	6.8
LOS	A	A	A	A	A
Approach Delay	4.1			6.5	6.8
Approach LOS	A			A	A

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 24.8	
Natural Cycle: 45	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.50	
Intersection Signal Delay: 5.1	Intersection LOS: A
Intersection Capacity Utilization 30.7%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 3: US-101 NB Off-Ramp & Santa Maria Wy/Santa Maria Way



Intersection	
Int Delay, s/veh	6.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	25	21	5	3	2
Future Vol, veh/h	2	25	21	5	3	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	27	23	5	3	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	55	4	5	0	-	0
Stage 1	4	-	-	-	-	-
Stage 2	51	-	-	-	-	-
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	953	1080	1616	-	-	-
Stage 1	1019	-	-	-	-	-
Stage 2	971	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	940	1080	1616	-	-	-
Mov Cap-2 Maneuver	940	-	-	-	-	-
Stage 1	1005	-	-	-	-	-
Stage 2	971	-	-	-	-	-

Approach	EB		NB		SB	
HCM Control Delay, s	8.5		5.9		0	
HCM LOS	A					

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1616	-	1068	-	-
HCM Lane V/C Ratio	0.014	-	0.027	-	-
HCM Control Delay (s)	7.3	0	8.5	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection						
Int Delay, s/veh	3.9					

Movement	WBL	WBR	SEL	SET	NWT	NWR
Lane Configurations						
Traffic Vol, veh/h	0	2	2	3	1	0
Future Vol, veh/h	0	2	2	3	1	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	0	2	2	3	1	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	8	1	1	0	-	0
Stage 1	1	-	-	-	-	-
Stage 2	7	-	-	-	-	-
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	1013	1084	1622	-	-	-
Stage 1	1022	-	-	-	-	-
Stage 2	1016	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	1012	1084	1622	-	-	-
Mov Cap-2 Maneuver	1012	-	-	-	-	-
Stage 1	1021	-	-	-	-	-
Stage 2	1016	-	-	-	-	-

Approach	WB	SE	NW
HCM Control Delay, s	8.3	2.9	0
HCM LOS	A		

Minor Lane/Major Mvmt	NWT	NWR	WBLn1	SEL	SET
Capacity (veh/h)	-	-	1084	1622	-
HCM Lane V/C Ratio	-	-	0.002	0.001	-
HCM Control Delay (s)	-	-	8.3	7.2	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	4.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	932	107	2	90	0	0	0	0	1	4	659
Future Vol, veh/h	0	932	107	2	90	0	0	0	0	1	4	659
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	275	-	-	-	-	-	-	-	325
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1013	116	2	98	0	0	0	0	1	4	716

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	-	0	0	1129	0	0				1173	1231	98
Stage 1	-	-	-	-	-	-				102	102	-
Stage 2	-	-	-	-	-	-				1071	1129	-
Critical Hdwy	-	-	-	4.12	-	-				6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-				5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.42	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-				3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	619	-	0				212	177	958
Stage 1	0	-	-	-	-	0				922	811	-
Stage 2	0	-	-	-	-	0				329	279	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	619	-	-				211	0	958
Mov Cap-2 Maneuver	-	-	-	-	-	-				211	0	-
Stage 1	-	-	-	-	-	-				919	0	-
Stage 2	-	-	-	-	-	-				329	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0.2	11.6
HCM LOS			B

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	-	-	619	-	943	958
HCM Lane V/C Ratio	-	-	0.004	-	0.259	0.498
HCM Control Delay (s)	-	-	10.8	-	10.1	12.4
HCM Lane LOS	-	-	B	-	B	B
HCM 95th %tile Q(veh)	-	-	0	-	1	2.8

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	398	0	8	254	0	0	0	0	14	0	495
Future Vol, veh/h	0	398	0	8	254	0	0	0	0	14	0	495
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Free
Storage Length	-	-	-	-	-	-	-	-	-	0	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	433	0	9	276	0	0	0	0	15	0	538

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	-	0	-	433	0	0	727	-	-
Stage 1	-	-	-	-	-	-	294	-	-
Stage 2	-	-	-	-	-	-	433	-	-
Critical Hdwy	-	-	-	4.12	-	-	6.42	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	5.42	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.42	-	-
Follow-up Hdwy	-	-	-	2.218	-	-	3.518	-	-
Pot Cap-1 Maneuver	0	-	0	1127	-	0	391	0	0
Stage 1	0	-	0	-	-	0	756	0	0
Stage 2	0	-	0	-	-	0	654	0	0
Platoon blocked, %		-			-				
Mov Cap-1 Maneuver	-	-	-	1127	-	-	387	0	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	387	0	-
Stage 1	-	-	-	-	-	-	749	0	-
Stage 2	-	-	-	-	-	-	654	0	-

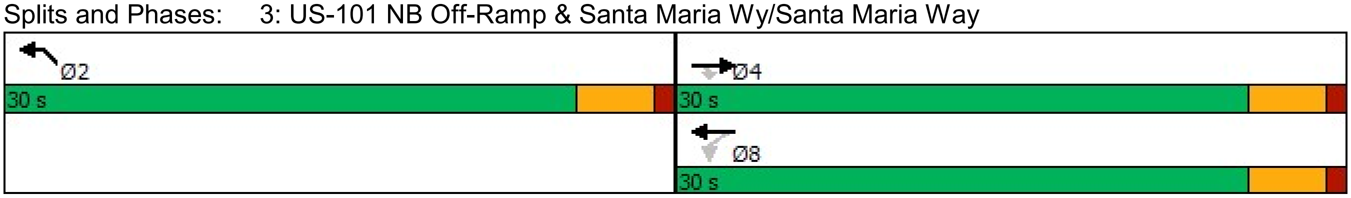
Approach	EB	WB	SB
HCM Control Delay, s	0	0.3	14.7
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	-	1127	-	387	-
HCM Lane V/C Ratio	-	0.008	-	0.039	-
HCM Control Delay (s)	-	8.2	0	14.7	0
HCM Lane LOS	-	A	A	B	A
HCM 95th %tile Q(veh)	-	0	-	0.1	-

Lane Group	EBT	EBR2	WBL	WBT	NWL
Lane Configurations					
Traffic Volume (vph)	7	351	81	35	268
Future Volume (vph)	7	351	81	35	268
Turn Type	NA	Perm	Perm	NA	Prot
Protected Phases	4			8	2
Permitted Phases		4	8		
Detector Phase	4	4	8	8	2
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5
Total Split (s)	30.0	30.0	30.0	30.0	30.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	None	None	Min
Act Effct Green (s)	7.7	7.7	7.7	7.7	10.1
Actuated g/C Ratio	0.29	0.29	0.29	0.29	0.37
v/c Ratio	0.02	0.53	0.22	0.07	0.44
Control Delay	7.3	4.3	9.1	7.7	8.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	7.3	4.3	9.1	7.7	8.5
LOS	A	A	A	A	A
Approach Delay	4.3			8.7	8.5
Approach LOS	A			A	A

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 27	
Natural Cycle: 45	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.53	
Intersection Signal Delay: 6.5	Intersection LOS: A
Intersection Capacity Utilization 33.8%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 3: US-101 NB Off-Ramp & Santa Maria Wy/Santa Maria Way



Intersection						
Int Delay, s/veh	6.6					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	8	100	0	0	16
Future Vol, veh/h	4	8	100	0	0	16
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	4	9	109	0	0	17

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	227	9	17	0	-	0
Stage 1	9	-	-	-	-	-
Stage 2	218	-	-	-	-	-
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	761	1073	1600	-	-	-
Stage 1	1014	-	-	-	-	-
Stage 2	818	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	709	1073	1600	-	-	-
Mov Cap-2 Maneuver	709	-	-	-	-	-
Stage 1	945	-	-	-	-	-
Stage 2	818	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9	7.4	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1600	-	916	-	-
HCM Lane V/C Ratio	0.068	-	0.014	-	-
HCM Control Delay (s)	7.4	0	9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.2	-	0	-	-

Intersection						
Int Delay, s/veh	3.7					

Movement	WBL	WBR	SEL	SET	NWT	NWR
Lane Configurations						
Traffic Vol, veh/h	0	4	1	0	6	0
Future Vol, veh/h	0	4	1	0	6	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	0	4	1	0	7	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	9	7	7	0	-	0
Stage 1	7	-	-	-	-	-
Stage 2	2	-	-	-	-	-
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	1011	1075	1614	-	-	-
Stage 1	1016	-	-	-	-	-
Stage 2	1021	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	1010	1075	1614	-	-	-
Mov Cap-2 Maneuver	1010	-	-	-	-	-
Stage 1	1015	-	-	-	-	-
Stage 2	1021	-	-	-	-	-

Approach	WB	SE	NW
HCM Control Delay, s	8.4	7.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NWT	NWR	WBLn1	SEL	SET
Capacity (veh/h)	-	-	1075	1614	-
HCM Lane V/C Ratio	-	-	0.004	0.001	-
HCM Control Delay (s)	-	-	8.4	7.2	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

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	0	729	55	3	109	0	0	0	0	2	2	819
Future Vol, veh/h	0	729	55	3	109	0	0	0	0	2	2	819
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	275	-	-	-	-	-	-	-	325
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	792	60	3	118	0	0	0	0	2	2	890

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	-	0	0	852	0	0				946	976	118
Stage 1	-	-	-	-	-	-				124	124	-
Stage 2	-	-	-	-	-	-				822	852	-
Critical Hdwy	-	-	-	4.12	-	-				6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-				5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.42	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-				3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	787	-	0				290	251	934
Stage 1	0	-	-	-	-	0				902	793	-
Stage 2	0	-	-	-	-	0				432	376	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	787	-	-				289	0	934
Mov Cap-2 Maneuver	-	-	-	-	-	-				289	0	-
Stage 1	-	-	-	-	-	-				898	0	-
Stage 2	-	-	-	-	-	-				432	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0.3	13.8
HCM LOS			B

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	-	-	787	-	919	934
HCM Lane V/C Ratio	-	-	0.004	-	0.328	0.635
HCM Control Delay (s)	-	-	9.6	-	10.8	15.3
HCM Lane LOS	-	-	A	-	B	C
HCM 95th %tile Q(veh)	-	-	0	-	1.4	4.7

Intersection	
Int Delay, s/veh	6.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	139	0	277	696	0	0	0	0	51	0	161
Future Vol, veh/h	0	139	0	277	696	0	0	0	0	51	0	161
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Free
Storage Length	-	-	-	-	-	-	-	-	-	0	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	151	0	301	757	0	0	0	0	55	0	175

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	-	0	-	151	0	0				1510	-	-
Stage 1	-	-	-	-	-	-				1359	-	-
Stage 2	-	-	-	-	-	-				151	-	-
Critical Hdwy	-	-	-	4.12	-	-				6.42	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-				5.42	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.42	-	-
Follow-up Hdwy	-	-	-	2.218	-	-				3.518	-	-
Pot Cap-1 Maneuver	0	-	0	1430	-	0				133	0	0
Stage 1	0	-	0	-	-	0				239	0	0
Stage 2	0	-	0	-	-	0				877	0	0
Platoon blocked, %		-			-							
Mov Cap-1 Maneuver	-	-	-	1430	-	-				85	0	-
Mov Cap-2 Maneuver	-	-	-	-	-	-				85	0	-
Stage 1	-	-	-	-	-	-				152	0	-
Stage 2	-	-	-	-	-	-				877	0	-

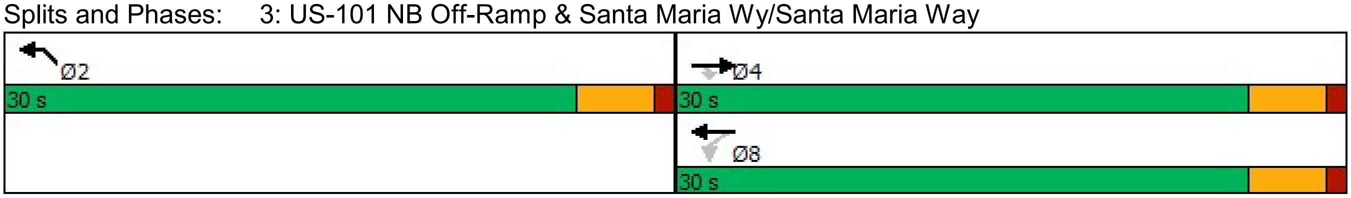
Approach	EB	WB	SB
HCM Control Delay, s	0	2.3	105.3
HCM LOS			F

Minor Lane/Major Mvmt	EBT	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	-	1430	-	85	-
HCM Lane V/C Ratio	-	0.211	-	0.652	-
HCM Control Delay (s)	-	8.2	0	105.3	0
HCM Lane LOS	-	A	A	F	A
HCM 95th %tile Q(veh)	-	0.8	-	3.1	-

Lane Group	EBT	EBR2	WBL	WBT	NWL
Lane Configurations					
Traffic Volume (vph)	65	116	7	881	93
Future Volume (vph)	65	116	7	881	93
Turn Type	NA	Perm	Perm	NA	Prot
Protected Phases	4			8	2
Permitted Phases		4	8		
Detector Phase	4	4	8	8	2
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5
Total Split (s)	30.0	30.0	30.0	30.0	30.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	None	None	Min
Act Effct Green (s)	25.6	25.6	25.6	25.6	7.8
Actuated g/C Ratio	0.60	0.60	0.60	0.60	0.18
v/c Ratio	0.06	0.13	0.01	0.85	0.37
Control Delay	4.2	1.5	4.1	18.6	15.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	4.2	1.5	4.1	18.6	15.5
LOS	A	A	A	B	B
Approach Delay	2.5			18.5	15.5
Approach LOS	A			B	B

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 42.4	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.85	
Intersection Signal Delay: 15.8	Intersection LOS: B
Intersection Capacity Utilization 60.4%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 3: US-101 NB Off-Ramp & Santa Maria Wy/Santa Maria Way



Intersection						
Int Delay, s/veh	10.2					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	88	888	0	0	0
Future Vol, veh/h	0	88	888	0	0	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	0	96	965	0	0	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1931	1	1	0	-	0
Stage 1	1	-	-	-	-	-
Stage 2	1930	-	-	-	-	-
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	73	1084	1622	-	-	-
Stage 1	1022	-	-	-	-	-
Stage 2	124	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	30	1084	1622	-	-	-
Mov Cap-2 Maneuver	30	-	-	-	-	-
Stage 1	414	-	-	-	-	-
Stage 2	124	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.6	10.4	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1622	-	1084	-	-
HCM Lane V/C Ratio	0.595	-	0.088	-	-
HCM Control Delay (s)	10.4	0	8.6	-	-
HCM Lane LOS	B	A	A	-	-
HCM 95th %tile Q(veh)	4.2	-	0.3	-	-

Intersection						
Int Delay, s/veh	18.3					

Movement	WBL	WBR	SEL	SET	NWT	NWR
Lane Configurations						
Traffic Vol, veh/h	1	436	40	49	496	0
Future Vol, veh/h	1	436	40	49	496	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	1	474	43	53	539	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	678	539	539	0	-	0
Stage 1	539	-	-	-	-	-
Stage 2	139	-	-	-	-	-
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	418	542	1029	-	-	-
Stage 1	585	-	-	-	-	-
Stage 2	888	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	400	542	1029	-	-	-
Mov Cap-2 Maneuver	400	-	-	-	-	-
Stage 1	560	-	-	-	-	-
Stage 2	888	-	-	-	-	-

Approach	WB	SE	NW
HCM Control Delay, s	42.1	3.9	0
HCM LOS	E		

Minor Lane/Major Mvmt	NWT	NWR	WBLn1	SEL	SET
Capacity (veh/h)	-	-	542	1029	-
HCM Lane V/C Ratio	-	-	0.876	0.042	-
HCM Control Delay (s)	-	-	42.1	8.7	0
HCM Lane LOS	-	-	E	A	A
HCM 95th %tile Q(veh)	-	-	9.8	0.1	-

Intersection	
Int Delay, s/veh	6.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	235	17	2	44	0	0	0	0	36	3	455
Future Vol, veh/h	0	235	17	2	44	0	0	0	0	36	3	455
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	275	-	-	-	-	-	-	-	325
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	255	18	2	48	0	0	0	0	39	3	495

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	-	0	0	273	0	0				316	325	48
Stage 1	-	-	-	-	-	-				52	52	-
Stage 2	-	-	-	-	-	-				264	273	-
Critical Hdwy	-	-	-	4.12	-	-				6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-				5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.42	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-				3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	1290	-	0				677	593	1021
Stage 1	0	-	-	-	-	0				970	852	-
Stage 2	0	-	-	-	-	0				780	684	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	1290	-	-				676	0	1021
Mov Cap-2 Maneuver	-	-	-	-	-	-				676	0	-
Stage 1	-	-	-	-	-	-				968	0	-
Stage 2	-	-	-	-	-	-				780	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0.3	10.1
HCM LOS			B

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	-	-	1290	-	930	1021
HCM Lane V/C Ratio	-	-	0.002	-	0.223	0.323
HCM Control Delay (s)	-	-	7.8	-	10	10.2
HCM Lane LOS	-	-	A	-	B	B
HCM 95th %tile Q(veh)	-	-	0	-	0.9	1.4

Appendix D – ICU Spreadsheets and Synchro Reports – Opening Year (2025)

E-W Street: Santa Maria Wy
N-S Street: College Dr/Bradley
Scenario: AM Peak		Right Turn Reduce 30%
Lane Capacity: 1600
Dual Lefts Capacity (per lane): 1600

Movement	AM 2025 without Project				AM 2025 + Project			
	Total Volume	No. of Lanes	Equivalent Lanes	Movement V/C	Total Volume	No. of Lanes	Equivalent Lanes	Movement V/C
EB Left	70	1	1.00	0.04	70	1	1.00	0.04
Comb. L-T								
EB Thru	322	2	2.00	0.10	308	2	2.00	0.10
Comb. T-R								
EB Right	175	1	1.00	0.11	175	1	1.00	0.11
Comb. L-T-R								
WB Left	451	1	1.00	0.28	448	1	1.00	0.28
Comb. L-T								
WB Thru	413	1	1.68	0.15	405	1	1.67	0.15
Comb. T-R		1				1		
WB Right	80		0.32	0.15	80		0.33	0.15
Comb. L-T-R								
NB Left	306	1	1.02	0.19	306	1	1.02	0.19
Comb. L-T		1				1		
NB Thru	292	1	1.98	0.09	292	1	1.98	0.09
Comb. T-R								
NB Right	426	1	1.00	0.00	421	1	1.00	0.00
Comb. L-T-R								
SB Left	101	1	1.00	0.06	101	1	1.00	0.06
Comb. L-T								
SB Thru	244	1	1.69	0.09	244	1	1.69	0.09
Comb. T-R		1				1		
SB Right	44		0.31	0.09	44		0.31	0.09
Comb. L-T-R								

Critical Volumes	E-W:	0.39	E-W:	0.39
	N-S:	0.28	N-S:	0.28
	Total:	0.67	Total:	0.67

Lost Time	0.10	0.10

V/C	0.768	0.766
Level of Service	C	C

E-W Street: Santa Maria Wy
N-S Street: College Dr/Bradley
Scenario: AM Peak — Right Turn Reduce 30%
Lane Capacity: 1600
Dual Lefts Capacity (per lane): 1600

Movement	PM 2025 without Project				PM 2025 + Project			
	Total Volume	No. of Lanes	Equivalent Lanes	Movement V/C	Total Volume	No. of Lanes	Equivalent Lanes	Movement V/C
EB Left	65	1	1.00	0.04	65	1	1.00	0.04
Comb. L-T		0				0		
EB Thru	318	2	2.00	0.10	315	2	2.00	0.10
Comb. T-R		0				0		
EB Right	232	1	1.00	0.15	232	1	1.00	0.15
Comb. L-T-R		0				0		
WB Left	513	1	1.00	0.32	507	1	1.00	0.32
Comb. L-T		0				0		
WB Thru	398	1	1.53	0.16	381	1	1.51	0.16
Comb. T-R		1				1		
WB Right	122	0	0.47	0.16	122	0	0.49	0.16
Comb. L-T-R		0				0		
NB Left	246	1	0.84	0.18	246	1	0.84	0.18
Comb. L-T		1				1		
NB Thru	339	1	2.16	0.10	339	1	2.16	0.10
Comb. T-R		0				0		
NB Right	532	1	1.00	0.00	531	1	1.00	0.00
Comb. L-T-R		0				0		
SB Left	100	1	1.00	0.06	100	1	1.00	0.06
Comb. L-T		0				0		
SB Thru	422	1	1.82	0.14	422	1	1.82	0.14
Comb. T-R		1				1		
SB Right	41	0	0.18	0.14	41	0	0.18	0.14
Comb. L-T-R		0				0		

Critical Volumes	E-W:	0.47	E-W:	0.46
	N-S:	0.33	N-S:	0.33
	Total:	0.79	Total:	0.79
Lost Time		0.10		0.10
V/C		0.893		0.889
Level of Service		D		D

P Santa Maria Wy
N-S Street: College Dr/Bradley
Scenario: AM Peak | Right Turn Reduce 30%
Lane Capacity: 1600
Dual Lefts Capacity (per lane): 1600

Movement	Sat Night 2025 without Project				Sat Night 2025 + Project			
	Total Volume	No. of Lanes	Equivalent Lanes	Movement V/C	Total Volume	No. of Lanes	Equivalent Lanes	Movement V/C
EB Left	97	1	1.00	0.06	97	1	1.00	0.06
Comb. L-T		0				0		
EB Thru	210	2	2.00	0.07	201	2	2.00	0.06
Comb. T-R		0				0		
EB Right	125	1	1.00	0.08	125	1	1.00	0.08
Comb. L-T-R		0				0		
WB Left	157	1	1.00	0.10	157	1	1.00	0.10
Comb. L-T		0				0		
WB Thru	200	1	1.75	0.07	109	1	1.59	0.04
Comb. T-R		1				1		
WB Right	28	0	0.25	0.07	28	0	0.41	0.04
Comb. L-T-R		0				0		
NB Left	213	1	0.71	0.19	213	1	0.71	0.19
Comb. L-T		1				1		
NB Thru	383	1	2.29	0.10	383	1	2.29	0.10
Comb. T-R		0				0		
NB Right	345	1	1.00	0.00	345	1	1.00	0.00
Comb. L-T-R		0				0		
SB Left	39	1	1.00	0.02	39	1	1.00	0.02
Comb. L-T		0				0		
SB Thru	54	1	0.95	0.04	54	1	0.95	0.04
Comb. T-R		1				1		
SB Right	60	0	1.05	0.04	60	0	1.05	0.04
Comb. L-T-R		0				0		

Critical Volumes	E-W:	0.18	E-W:	0.18
	N-S:	0.22	N-S:	0.22
	Total:	0.40	Total:	0.40

Lost Time	0.10	0.10

V/C	0.498	0.498
Level of Service	A	A

E-W Street:	Union Valley Pkwy
N-S Street:	Bradley Rd
Scenario:	AM Peak
Lane Capacity:	1600
Dual Lefts Capacity (per lane):	1600

Right Turn Reduce 30%

Movement	AM 2025 without Project				AM 2025 + Project			
	Total Volume	No. of Lanes	Equivalent Lanes	Movement V/C	Total Volume	No. of Lanes	Equivalent Lanes	Movement V/C
EB Left	28	2	2.00	0.01	28	2	2.00	0.01
Comb. L-T								
EB Thru	464	2	2.00	0.15	467	2	2.00	0.15
Comb. T-R								
EB Right	54	1	1.00	0.03	54	1	1.00	0.03
Comb. L-T-R								
WB Left	90	2	2.00	0.03	91	2	2.00	0.03
Comb. L-T								
WB Thru	399	2	2.00	0.12	401	2	2.00	0.13
Comb. T-R								
WB Right	14	1	1.00	0.01	17	1	1.00	0.01
Comb. L-T-R								
NB Left	110	1	1.00	0.07	110	1	1.00	0.07
Comb. L-T								
NB Thru	296	2	2.00	0.09	296	2	2.00	0.09
Comb. T-R								
NB Right	176	1	1.00	0.00	178	1	1.00	0.00
Comb. L-T-R								
SB Left	51	1	1.00	0.03	56	1	1.00	0.04
Comb. L-T								
SB Thru	160	1	1.68	0.06	160	1	1.68	0.06
Comb. T-R		1				1		
SB Right	30		0.32	0.06	30		0.32	0.06
Comb. L-T-R								

Critical Volumes	E-W:	0.17	E-W:	0.17
	N-S:	0.13	N-S:	0.13
	Total:	0.30	Total:	0.30

Lost Time	0.10	0.10

V/C	0.401	0.403
Level of Service	A	A

E-W Street: Union Valley Pkwy
N-S Street: Bradley Rd
Scenario: PM Peak — Right Turn Reduce 30%
Lane Capacity: 1600
Dual Lefts Capacity (per lane): 1600

Movement	PM 2025 without Project Total Volume	No. of Lanes	Equivalent Lanes	Movement V/C	PM 2025 + Project Total Volume	No. of Lanes	Equivalent Lanes	Movement V/C
EB Left	60	2	2.00	0.02	60	2	2.00	0.02
Comb. L-T		0				0		
EB Thru	524	2	2.00	0.16	525	2	2.00	0.16
Comb. T-R		0				0		
EB Right	165	1	1.00	0.10	165	1	1.00	0.10
Comb. L-T-R		0				0		
WB Left	217	2	2.00	0.07	219	2	2.00	0.07
Comb. L-T		0				0		
WB Thru	587	2	2.00	0.18	590	2	2.00	0.18
Comb. T-R		0				0		
WB Right	54	1	1.00	0.03	60	1	1.00	0.04
Comb. L-T-R		0				0		
NB Left	83	1	1.00	0.05	83	1	1.00	0.05
Comb. L-T		0				0		
NB Thru	372	2	2.00	0.12	372	2	2.00	0.12
Comb. T-R		0				0		
NB Right	127	1	1.00	0.00	127	1	1.00	0.00
Comb. L-T-R		0				0		
SB Left	40	1	1.00	0.03	41	1	1.00	0.03
Comb. L-T		0				0		
SB Thru	443	1	1.74	0.16	443	1	1.74	0.16
Comb. T-R		1				1		
SB Right	65	0	0.26	0.16	65	0	0.26	0.16
Comb. L-T-R		0				0		

	PM 2025 without Project		PM 2025 + Project	
Critical Volumes	E-W:	0.23	E-W:	0.23
	N-S:	0.21	N-S:	0.21
	Total:	0.44	Total:	0.44
Lost Time		0.10		0.10
V/C		0.542		0.543
Level of Service		A		A

E-W Street: Union Valley Pkwy
N-S Street: Bradley Rd
Scenario: Sat Event Exit Pea Right Turn Reduce 30%
Lane Capacity: 1600
Dual Lefts Capacity (per lane): 1600

Movement	Sat Night 2025 without Project Total Volume	No. of Lanes	Equivalent Lanes	Movement V/C	Sat Night 2025 + Project Total Volume	No. of Lanes	Equivalent Lanes	Movement V/C
EB Left	18	2	2.00	0.01	18	2	2.00	0.01
Comb. L-T		0				0		
EB Thru	147	2	2.00	0.05	150	2	2.00	0.05
Comb. T-R		0				0		
EB Right	61	1	1.00	0.04	61	1	1.00	0.04
Comb. L-T-R		0				0		
WB Left	98	2	2.00	0.03	116	2	2.00	0.04
Comb. L-T		0				0		
WB Thru	318	2	2.00	0.10	345	2	2.00	0.11
Comb. T-R		0				0		
WB Right	37	1	1.00	0.02	83	1	1.00	0.05
Comb. L-T-R		0				0		
NB Left	34	1	1.00	0.02	34	1	1.00	0.02
Comb. L-T		0				0		
NB Thru	229	2	2.00	0.07	229	2	2.00	0.07
Comb. T-R		0				0		
NB Right	62	1	1.00	0.00	64	1	1.00	0.00
Comb. L-T-R		0				0		
SB Left	44	1	1.00	0.03	49	1	1.00	0.03
Comb. L-T		0				0		
SB Thru	178	1	1.64	0.07	178	1	1.64	0.07
Comb. T-R		1				1		
SB Right	39	0	0.36	0.07	39	0	0.36	0.07
Comb. L-T-R		0				0		

	Sat Night 2025 without Project		Sat Night 2025 + Project	
Critical Volumes	E-W:	0.11	E-W:	0.11
	N-S:	0.10	N-S:	0.10
	Total:	0.20	Total:	0.22
Lost Time		0.10		0.10
V/C		0.304		0.316
Level of Service		A		A

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑			↰↑					↰		↱
Traffic Vol, veh/h	0	514	0	11	452	0	0	0	0	44	0	487
Future Vol, veh/h	0	514	0	11	452	0	0	0	0	44	0	487
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Free
Storage Length	-	-	-	-	-	-	-	-	-	0	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	559	0	12	491	0	0	0	0	48	0	529

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	-	0	-	559	0	0				1074	-	-
Stage 1	-	-	-	-	-	-				515	-	-
Stage 2	-	-	-	-	-	-				559	-	-
Critical Hdwy	-	-	-	4.12	-	-				6.42	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-				5.42	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.42	-	-
Follow-up Hdwy	-	-	-	2.218	-	-				3.518	-	-
Pot Cap-1 Maneuver	0	-	0	1012	-	0				243	0	0
Stage 1	0	-	0	-	-	0				600	0	0
Stage 2	0	-	0	-	-	0				572	0	0
Platoon blocked, %		-			-							
Mov Cap-1 Maneuver	-	-	-	1012	-	-				239	0	-
Mov Cap-2 Maneuver	-	-	-	-	-	-				239	0	-
Stage 1	-	-	-	-	-	-				590	0	-
Stage 2	-	-	-	-	-	-				572	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0.2	23.8
HCM LOS			C

Minor Lane/Major Mvmt	EBT	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	-	1012	-	239	-
HCM Lane V/C Ratio	-	0.012	-	0.2	-
HCM Control Delay (s)	-	8.6	0	23.8	0
HCM Lane LOS	-	A	A	C	A
HCM 95th %tile Q(veh)	-	0	-	0.7	-

Intersection	
Int Delay, s/veh	1.5

Movement	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER
Lane Configurations										
Traffic Vol, veh/h	30	28	0	361	21	70	0	318	0	0
Future Vol, veh/h	30	28	0	361	21	70	0	318	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	None	-	-	None	-	-
Storage Length	0	-	-	-	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	-	-	16979	-	16979	-
Grade, %	0	-	-	0	-	-	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	33	30	0	392	23	76	0	346	0	0

Major/Minor	Minor1		Major1		
Conflicting Flow All	404	404	-	0	0
Stage 1	404	-	-	-	-
Stage 2	0	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	-
Pot Cap-1 Maneuver	603	647	0	-	-
Stage 1	674	-	0	-	-
Stage 2	-	-	0	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	603	647	-	-	-
Mov Cap-2 Maneuver	603	-	-	-	-
Stage 1	674	-	-	-	-
Stage 2	-	-	-	-	-

Approach	WB	NB
HCM Control Delay, s	11.4	0
HCM LOS	B	

Minor Lane/Major Mvmt	NBT	NBR	WBLn1
Capacity (veh/h)	-	-	623
HCM Lane V/C Ratio	-	-	0.101
HCM Control Delay (s)	-	-	11.4
HCM Lane LOS	-	-	B
HCM 95th %tile Q(veh)	-	-	0.3

Intersection	
Int Delay, s/veh	7.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	94	55	5	3	2
Future Vol, veh/h	2	94	55	5	3	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	102	60	5	3	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	129	4	5	0	-	0
Stage 1	4	-	-	-	-	-
Stage 2	125	-	-	-	-	-
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	865	1080	1616	-	-	-
Stage 1	1019	-	-	-	-	-
Stage 2	901	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	833	1080	1616	-	-	-
Mov Cap-2 Maneuver	833	-	-	-	-	-
Stage 1	981	-	-	-	-	-
Stage 2	901	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.7	6.7	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1616	-	1073	-	-
HCM Lane V/C Ratio	0.037	-	0.097	-	-
HCM Control Delay (s)	7.3	0	8.7	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.3	-	-

Intersection						
Int Delay, s/veh	3.9					

Movement	WBL	WBR	SEL	SET	NWT	NWR
Lane Configurations						
Traffic Vol, veh/h	0	2	2	3	1	0
Future Vol, veh/h	0	2	2	3	1	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	0	2	2	3	1	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	8	1	1	0	-	0
Stage 1	1	-	-	-	-	-
Stage 2	7	-	-	-	-	-
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	1013	1084	1622	-	-	-
Stage 1	1022	-	-	-	-	-
Stage 2	1016	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	1012	1084	1622	-	-	-
Mov Cap-2 Maneuver	1012	-	-	-	-	-
Stage 1	1021	-	-	-	-	-
Stage 2	1016	-	-	-	-	-

Approach	WB	SE	NW
HCM Control Delay, s	8.3	2.9	0
HCM LOS	A		

Minor Lane/Major Mvmt	NWT	NWR	WBLn1	SEL	SET
Capacity (veh/h)	-	-	1084	1622	-
HCM Lane V/C Ratio	-	-	0.002	0.001	-
HCM Control Delay (s)	-	-	8.3	7.2	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	4.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	965	118	2	94	0	0	0	0	1	4	670
Future Vol, veh/h	0	965	118	2	94	0	0	0	0	1	4	670
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	275	-	-	-	-	-	-	-	325
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1049	128	2	102	0	0	0	0	1	4	728

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	-	0	0	1177	0	0				1219	1283	102
Stage 1	-	-	-	-	-	-				106	106	-
Stage 2	-	-	-	-	-	-				1113	1177	-
Critical Hdwy	-	-	-	4.12	-	-				6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-				5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.42	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-				3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	593	-	0				199	165	953
Stage 1	0	-	-	-	-	0				918	807	-
Stage 2	0	-	-	-	-	0				314	265	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	593	-	-				198	0	953
Mov Cap-2 Maneuver	-	-	-	-	-	-				198	0	-
Stage 1	-	-	-	-	-	-				915	0	-
Stage 2	-	-	-	-	-	-				314	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0.2	11.8
HCM LOS			B

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	-	-	593	-	937	953
HCM Lane V/C Ratio	-	-	0.004	-	0.265	0.509
HCM Control Delay (s)	-	-	11.1	-	10.2	12.6
HCM Lane LOS	-	-	B	-	B	B
HCM 95th %tile Q(veh)	-	-	0	-	1.1	3

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	408	0	11	542	0	0	0	0	22	0	507
Future Vol, veh/h	0	408	0	11	542	0	0	0	0	22	0	507
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Free
Storage Length	-	-	-	-	-	-	-	-	-	0	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	443	0	12	589	0	0	0	0	24	0	551

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	-	0	-	443	0	0	1056	-	-
Stage 1	-	-	-	-	-	-	613	-	-
Stage 2	-	-	-	-	-	-	443	-	-
Critical Hdwy	-	-	-	4.12	-	-	6.42	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	5.42	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.42	-	-
Follow-up Hdwy	-	-	-	2.218	-	-	3.518	-	-
Pot Cap-1 Maneuver	0	-	0	1117	-	0	250	0	0
Stage 1	0	-	0	-	-	0	541	0	0
Stage 2	0	-	0	-	-	0	647	0	0
Platoon blocked, %		-			-				
Mov Cap-1 Maneuver	-	-	-	1117	-	-	246	0	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	246	0	-
Stage 1	-	-	-	-	-	-	532	0	-
Stage 2	-	-	-	-	-	-	647	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0.2	21.2
HCM LOS			C

Minor Lane/Major Mvmt	EBT	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	-	1117	-	246	-
HCM Lane V/C Ratio	-	0.011	-	0.097	-
HCM Control Delay (s)	-	8.3	0	21.2	0
HCM Lane LOS	-	A	A	C	A
HCM 95th %tile Q(veh)	-	0	-	0.3	-

Intersection	
Int Delay, s/veh	3

Movement	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER
Lane Configurations										
Traffic Vol, veh/h	90	41	0	553	8	18	0	358	0	0
Future Vol, veh/h	90	41	0	553	8	18	0	358	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	None	-	-	None	-	-
Storage Length	0	-	-	-	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	-	-	16979	-	16979	-
Grade, %	0	-	-	0	-	-	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	98	45	0	601	9	20	0	389	0	0

Major/Minor	Minor1		Major1		
Conflicting Flow All	606	606	-	0	0
Stage 1	606	-	-	-	-
Stage 2	0	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	-
Pot Cap-1 Maneuver	460	497	0	-	-
Stage 1	545	-	0	-	-
Stage 2	-	-	0	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	460	497	-	-	-
Mov Cap-2 Maneuver	460	-	-	-	-
Stage 1	545	-	-	-	-
Stage 2	-	-	-	-	-

Approach	WB	NB
HCM Control Delay, s	15.9	0
HCM LOS	C	

Minor Lane/Major Mvmt	NBT	NBR	WBLn1
Capacity (veh/h)	-	-	471
HCM Lane V/C Ratio	-	-	0.302
HCM Control Delay (s)	-	-	15.9
HCM Lane LOS	-	-	C
HCM 95th %tile Q(veh)	-	-	1.3

Intersection	
Int Delay, s/veh	6.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	21	114	0	0	16
Future Vol, veh/h	4	21	114	0	0	16
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	4	23	124	0	0	17

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	257	9	17	0	-	0
Stage 1	9	-	-	-	-	-
Stage 2	248	-	-	-	-	-
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	732	1073	1600	-	-	-
Stage 1	1014	-	-	-	-	-
Stage 2	793	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	676	1073	1600	-	-	-
Mov Cap-2 Maneuver	676	-	-	-	-	-
Stage 1	936	-	-	-	-	-
Stage 2	793	-	-	-	-	-

Approach	EB		NB		SB	
HCM Control Delay, s	8.8		7.4		0	
HCM LOS	A					

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1600	-	981	-	-
HCM Lane V/C Ratio	0.077	-	0.028	-	-
HCM Control Delay (s)	7.4	0	8.8	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.3	-	0.1	-	-

Intersection	
Int Delay, s/veh	3.7

Movement	WBL	WBR	SEL	SET	NWT	NWR
Lane Configurations						
Traffic Vol, veh/h	0	4	1	0	6	0
Future Vol, veh/h	0	4	1	0	6	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	0	4	1	0	7	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	9	7	7	0	-	0
Stage 1	7	-	-	-	-	-
Stage 2	2	-	-	-	-	-
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	1011	1075	1614	-	-	-
Stage 1	1016	-	-	-	-	-
Stage 2	1021	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	1010	1075	1614	-	-	-
Mov Cap-2 Maneuver	1010	-	-	-	-	-
Stage 1	1015	-	-	-	-	-
Stage 2	1021	-	-	-	-	-

Approach	WB	SE	NW
HCM Control Delay, s	8.4	7.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NWT	NWR	WBLn1	SEL	SET
Capacity (veh/h)	-	-	1075	1614	-
HCM Lane V/C Ratio	-	-	0.004	0.001	-
HCM Control Delay (s)	-	-	8.4	7.2	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	749	62	3	120	0	0	0	0	2	2	853
Future Vol, veh/h	0	749	62	3	120	0	0	0	0	2	2	853
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	275	-	-	-	-	-	-	-	325
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	814	67	3	130	0	0	0	0	2	2	927

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	-	0	0	881	0	0				984	1017	130
Stage 1	-	-	-	-	-	-				136	136	-
Stage 2	-	-	-	-	-	-				848	881	-
Critical Hdwy	-	-	-	4.12	-	-				6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-				5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.42	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-				3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	767	-	0				275	238	~ 920
Stage 1	0	-	-	-	-	0				890	784	-
Stage 2	0	-	-	-	-	0				420	365	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	767	-	-				274	0	~ 920
Mov Cap-2 Maneuver	-	-	-	-	-	-				274	0	-
Stage 1	-	-	-	-	-	-				886	0	-
Stage 2	-	-	-	-	-	-				420	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0.2	14.7
HCM LOS			B

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	-	-	767	-	905	920
HCM Lane V/C Ratio	-	-	0.004	-	0.346	0.672
HCM Control Delay (s)	-	-	9.7	-	11.1	16.5
HCM Lane LOS	-	-	A	-	B	C
HCM 95th %tile Q(veh)	-	-	0	-	1.6	5.4

Notes

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

Intersection	
Int Delay, s/veh	13.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	144	0	296	875	0	0	0	0	51	0	165
Future Vol, veh/h	0	144	0	296	875	0	0	0	0	51	0	165
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Free
Storage Length	-	-	-	-	-	-	-	-	-	0	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	157	0	322	951	0	0	0	0	55	0	179

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	-	0	-	157	0	0				1752	-	-
Stage 1	-	-	-	-	-	-				1595	-	-
Stage 2	-	-	-	-	-	-				157	-	-
Critical Hdwy	-	-	-	4.12	-	-				6.42	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-				5.42	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.42	-	-
Follow-up Hdwy	-	-	-	2.218	-	-				3.518	-	-
Pot Cap-1 Maneuver	0	-	0	1423	-	0				94	0	0
Stage 1	0	-	0	-	-	0				183	0	0
Stage 2	0	-	0	-	-	0				871	0	0
Platoon blocked, %		-			-							
Mov Cap-1 Maneuver	-	-	-	1423	-	-				~ 49	0	-
Mov Cap-2 Maneuver	-	-	-	-	-	-				~ 49	0	-
Stage 1	-	-	-	-	-	-				95	0	-
Stage 2	-	-	-	-	-	-				871	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	2.1	$ 303.7
HCM LOS			F

Minor Lane/Major Mvmt	EBT	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	-	1423	-	49	-
HCM Lane V/C Ratio	-	0.226	-	1.131	-
HCM Control Delay (s)	-	8.3	0	$ 303.7	0
HCM Lane LOS	-	A	A	F	A
HCM 95th %tile Q(veh)	-	0.9	-	5	-

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

Intersection	
Int Delay, s/veh	140.6

Movement	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER
Lane Configurations										
Traffic Vol, veh/h	7	904	0	271	26	65	0	120	0	0
Future Vol, veh/h	7	904	0	271	26	65	0	120	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	None	-	-	None	-	-
Storage Length	0	-	-	-	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	-	-	16979	-	16979	-
Grade, %	0	-	-	0	-	-	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	983	0	295	28	71	0	130	0	0

Major/Minor	Minor1		Major1		
Conflicting Flow All	309	309	-	0	0
Stage 1	309	-	-	-	-
Stage 2	0	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	-
Pot Cap-1 Maneuver	683	~ 731	0	-	-
Stage 1	745	-	0	-	-
Stage 2	-	-	0	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	683	~ 731	-	-	-
Mov Cap-2 Maneuver	683	-	-	-	-
Stage 1	745	-	-	-	-
Stage 2	-	-	-	-	-

Approach	WB	NB
HCM Control Delay, s	186.5	0
HCM LOS	F	

Minor Lane/Major Mvmt	NBT	NBR	WBLn1
Capacity (veh/h)	-	-	731
HCM Lane V/C Ratio	-	-	1.355
HCM Control Delay (s)	-	-	186.5
HCM Lane LOS	-	-	F
HCM 95th %tile Q(veh)	-	-	41.4

Notes

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

Intersection						
Int Delay, s/veh	10.4					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	92	911	0	0	0
Future Vol, veh/h	0	92	911	0	0	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	0	100	990	0	0	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1981	1	1	0	-	0
Stage 1	1	-	-	-	-	-
Stage 2	1980	-	-	-	-	-
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	68	1084	1622	-	-	-
Stage 1	1022	-	-	-	-	-
Stage 2	117	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	27	1084	1622	-	-	-
Mov Cap-2 Maneuver	27	-	-	-	-	-
Stage 1	399	-	-	-	-	-
Stage 2	117	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.7	10.6	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1622	-	1084	-	-
HCM Lane V/C Ratio	0.61	-	0.092	-	-
HCM Control Delay (s)	10.6	0	8.7	-	-
HCM Lane LOS	B	A	A	-	-
HCM 95th %tile Q(veh)	4.5	-	0.3	-	-

Intersection						
Int Delay, s/veh	22.1					

Movement	WBL	WBR	SEL	SET	NWT	NWR
Lane Configurations						
Traffic Vol, veh/h	1	459	44	49	496	0
Future Vol, veh/h	1	459	44	49	496	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	1	499	48	53	539	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	688	539	539	0	-	0
Stage 1	539	-	-	-	-	-
Stage 2	149	-	-	-	-	-
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	412	542	1029	-	-	-
Stage 1	585	-	-	-	-	-
Stage 2	879	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	392	542	1029	-	-	-
Mov Cap-2 Maneuver	392	-	-	-	-	-
Stage 1	557	-	-	-	-	-
Stage 2	879	-	-	-	-	-

Approach	WB	SE	NW
HCM Control Delay, s	49.5	4.1	0
HCM LOS	E		

Minor Lane/Major Mvmt	NWT	NWR	WBLn1	SEL	SET
Capacity (veh/h)	-	-	542	1029	-
HCM Lane V/C Ratio	-	-	0.923	0.046	-
HCM Control Delay (s)	-	-	49.5	8.7	0
HCM Lane LOS	-	-	E	A	A
HCM 95th %tile Q(veh)	-	-	11.3	0.1	-

Intersection	
Int Delay, s/veh	6.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	242	19	2	52	0	0	0	0	36	3	481
Future Vol, veh/h	0	242	19	2	52	0	0	0	0	36	3	481
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	275	-	-	-	-	-	-	-	325
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	263	21	2	57	0	0	0	0	39	3	523

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	-	0	0	284	0	0				335	345	57
Stage 1	-	-	-	-	-	-				61	61	-
Stage 2	-	-	-	-	-	-				274	284	-
Critical Hdwy	-	-	-	4.12	-	-				6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-				5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.42	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-				3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	1278	-	0				660	578	1009
Stage 1	0	-	-	-	-	0				962	844	-
Stage 2	0	-	-	-	-	0				772	676	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	1278	-	-				659	0	1009
Mov Cap-2 Maneuver	-	-	-	-	-	-				659	0	-
Stage 1	-	-	-	-	-	-				960	0	-
Stage 2	-	-	-	-	-	-				772	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0.3	10.3
HCM LOS			B

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	-	-	1278	-	919	1009
HCM Lane V/C Ratio	-	-	0.002	-	0.236	0.345
HCM Control Delay (s)	-	-	7.8	-	10.1	10.4
HCM Lane LOS	-	-	A	-	B	B
HCM 95th %tile Q(veh)	-	-	0	-	0.9	1.6

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	500	0	7	444	0	0	0	0	44	0	487
Future Vol, veh/h	0	500	0	7	444	0	0	0	0	44	0	487
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Free
Storage Length	-	-	-	-	-	-	-	-	-	0	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	543	0	8	483	0	0	0	0	48	0	529

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	-	0	-	543	0	0	1042	-	-
Stage 1	-	-	-	-	-	-	499	-	-
Stage 2	-	-	-	-	-	-	543	-	-
Critical Hdwy	-	-	-	4.12	-	-	6.42	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	5.42	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.42	-	-
Follow-up Hdwy	-	-	-	2.218	-	-	3.518	-	-
Pot Cap-1 Maneuver	0	-	0	1026	-	0	254	0	0
Stage 1	0	-	0	-	-	0	610	0	0
Stage 2	0	-	0	-	-	0	582	0	0
Platoon blocked, %		-			-				
Mov Cap-1 Maneuver	-	-	-	1026	-	-	251	0	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	251	0	-
Stage 1	-	-	-	-	-	-	603	0	-
Stage 2	-	-	-	-	-	-	582	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0.1	22.7
HCM LOS			C

Minor Lane/Major Mvmt	EBT	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	-	1026	-	251	-
HCM Lane V/C Ratio	-	0.007	-	0.191	-
HCM Control Delay (s)	-	8.5	0	22.7	0
HCM Lane LOS	-	A	A	C	A
HCM 95th %tile Q(veh)	-	0	-	0.7	-

Intersection	
Int Delay, s/veh	1.5

Movement	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER
Lane Configurations										
Traffic Vol, veh/h	30	28	0	361	13	56	0	318	0	0
Future Vol, veh/h	30	28	0	361	13	56	0	318	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	None	-	-	None	-	-
Storage Length	0	-	-	-	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	-	-	16979	-	16979	-
Grade, %	0	-	-	0	-	-	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	33	30	0	392	14	61	0	346	0	0

Major/Minor	Minor1		Major1		
Conflicting Flow All	399	399	-	0	0
Stage 1	399	-	-	-	-
Stage 2	0	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	-
Pot Cap-1 Maneuver	607	651	0	-	-
Stage 1	678	-	0	-	-
Stage 2	-	-	0	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	607	651	-	-	-
Mov Cap-2 Maneuver	607	-	-	-	-
Stage 1	678	-	-	-	-
Stage 2	-	-	-	-	-

Approach	WB	NB
HCM Control Delay, s	11.4	0
HCM LOS	B	

Minor Lane/Major Mvmt	NBT	NBR	WBLn1
Capacity (veh/h)	-	-	627
HCM Lane V/C Ratio	-	-	0.101
HCM Control Delay (s)	-	-	11.4
HCM Lane LOS	-	-	B
HCM 95th %tile Q(veh)	-	-	0.3

Intersection	
Int Delay, s/veh	7.5

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	72	55	5	3	2
Future Vol, veh/h	2	72	55	5	3	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	78	60	5	3	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	129	4	5	0	-	0
Stage 1	4	-	-	-	-	-
Stage 2	125	-	-	-	-	-
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	865	1080	1616	-	-	-
Stage 1	1019	-	-	-	-	-
Stage 2	901	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	833	1080	1616	-	-	-
Mov Cap-2 Maneuver	833	-	-	-	-	-
Stage 1	981	-	-	-	-	-
Stage 2	901	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.6	6.7	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1616	-	1071	-	-
HCM Lane V/C Ratio	0.037	-	0.075	-	-
HCM Control Delay (s)	7.3	0	8.6	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.2	-	-

Intersection	
Int Delay, s/veh	0.8

Movement	WBL	WBR	SEL	SET	NWT	NWR
Lane Configurations						
Traffic Vol, veh/h	0	2	2	15	22	0
Future Vol, veh/h	0	2	2	15	22	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	0	2	2	16	24	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	44	24	24	0	-	0
Stage 1	24	-	-	-	-	-
Stage 2	20	-	-	-	-	-
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	967	1052	1591	-	-	-
Stage 1	999	-	-	-	-	-
Stage 2	1003	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	966	1052	1591	-	-	-
Mov Cap-2 Maneuver	966	-	-	-	-	-
Stage 1	998	-	-	-	-	-
Stage 2	1003	-	-	-	-	-

Approach	WB	SE	NW
HCM Control Delay, s	8.4	0.9	0
HCM LOS	A		

Minor Lane/Major Mvmt	NWT	NWR	WBLn1	SEL	SET
Capacity (veh/h)	-	-	1052	1591	-
HCM Lane V/C Ratio	-	-	0.002	0.001	-
HCM Control Delay (s)	-	-	8.4	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR	NWL	NWR
Lane Configurations								
Traffic Vol, veh/h	9	0	3	6	0	0	96	5
Future Vol, veh/h	9	0	3	6	0	0	96	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	-	-	None	-	-	-	None
Storage Length	-	-	200	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	16974	-	0	-
Grade, %	0	-	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2
Mvmt Flow	10	0	3	7	0	0	104	5

Major/Minor	Major1		Major2				Minor1	
Conflicting Flow All	0	0	1047	0			13	0
Stage 1	-	-	-	-			0	-
Stage 2	-	-	-	-			13	-
Critical Hdwy	-	-	4.12	-			6.42	6.22
Critical Hdwy Stg 1	-	-	-	-			-	-
Critical Hdwy Stg 2	-	-	-	-			5.42	-
Follow-up Hdwy	-	-	2.218	-			3.518	3.318
Pot Cap-1 Maneuver	-	-	665	-			1006	-
Stage 1	-	-	-	-			-	-
Stage 2	-	-	-	-			1010	-
Platoon blocked, %	-	-		-				
Mov Cap-1 Maneuver	-	-	665	-			995	-
Mov Cap-2 Maneuver	-	-	-	-			995	-
Stage 1	-	-	-	-			-	-
Stage 2	-	-	-	-			1010	-

Approach	EB	WB	NW
HCM Control Delay, s	0.1	3.5	
HCM LOS			-

Minor Lane/Major Mvmt	NWLn1	EBT	EBR	EBR2	WBL	WBT
Capacity (veh/h)	-	1614	-	-	665	-
HCM Lane V/C Ratio	-	0.006	-	-	0.005	-
HCM Control Delay (s)	-	7.2	-	-	10.4	-
HCM Lane LOS	-	A	-	-	B	-
HCM 95th %tile Q(veh)	-	0	-	-	0	-

Intersection	
Int Delay, s/veh	4.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	974	118	2	100	0	0	0	0	1	4	670
Future Vol, veh/h	0	974	118	2	100	0	0	0	0	1	4	670
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	275	-	-	-	-	-	-	-	325
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1059	128	2	109	0	0	0	0	1	4	728

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	-	0	0	1187	0	0	1236	1300	109
Stage 1	-	-	-	-	-	-	113	113	-
Stage 2	-	-	-	-	-	-	1123	1187	-
Critical Hdwy	-	-	-	4.12	-	-	6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.42	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-	3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	588	-	0	195	161	945
Stage 1	0	-	-	-	-	0	912	802	-
Stage 2	0	-	-	-	-	0	311	262	-
Platoon blocked, %		-	-		-				
Mov Cap-1 Maneuver	-	-	-	588	-	-	194	0	945
Mov Cap-2 Maneuver	-	-	-	-	-	-	194	0	-
Stage 1	-	-	-	-	-	-	909	0	-
Stage 2	-	-	-	-	-	-	311	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0.2	12
HCM LOS			B

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	-	-	588	-	929	945
HCM Lane V/C Ratio	-	-	0.004	-	0.267	0.514
HCM Control Delay (s)	-	-	11.1	-	10.3	12.8
HCM Lane LOS	-	-	B	-	B	B
HCM 95th %tile Q(veh)	-	-	0	-	1.1	3

Intersection						
Int Delay, s/veh	5.5					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	14	0	0	0	0	8
Future Vol, veh/h	14	0	0	0	0	8
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	15	0	0	0	0	9

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	5	5	9	0	-	0
Stage 1	5	-	-	-	-	-
Stage 2	0	-	-	-	-	-
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	1017	1078	1611	-	-	-
Stage 1	1018	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	1017	1078	1611	-	-	-
Mov Cap-2 Maneuver	1017	-	-	-	-	-
Stage 1	1018	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.6	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1611	-	1017	-	-
HCM Lane V/C Ratio	-	-	0.015	-	-
HCM Control Delay (s)	0	-	8.6	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	405	0	2	525	0	0	0	0	22	0	507
Future Vol, veh/h	0	405	0	2	525	0	0	0	0	22	0	507
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Free
Storage Length	-	-	-	-	-	-	-	-	-	0	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	440	0	2	571	0	0	0	0	24	0	551

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	-	0	-	440	0	0				1015	-	-
Stage 1	-	-	-	-	-	-				575	-	-
Stage 2	-	-	-	-	-	-				440	-	-
Critical Hdwy	-	-	-	4.12	-	-				6.42	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-				5.42	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.42	-	-
Follow-up Hdwy	-	-	-	2.218	-	-				3.518	-	-
Pot Cap-1 Maneuver	0	-	0	1120	-	0				264	0	0
Stage 1	0	-	0	-	-	0				563	0	0
Stage 2	0	-	0	-	-	0				649	0	0
Platoon blocked, %		-			-							
Mov Cap-1 Maneuver	-	-	-	1120	-	-				263	0	-
Mov Cap-2 Maneuver	-	-	-	-	-	-				263	0	-
Stage 1	-	-	-	-	-	-				561	0	-
Stage 2	-	-	-	-	-	-				649	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	20.1
HCM LOS			C

Minor Lane/Major Mvmt	EBT	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	-	1120	-	263	-
HCM Lane V/C Ratio	-	0.002	-	0.091	-
HCM Control Delay (s)	-	8.2	0	20.1	0
HCM Lane LOS	-	A	A	C	A
HCM 95th %tile Q(veh)	-	0	-	0.3	-

Intersection	
Int Delay, s/veh	3

Movement	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER
Lane Configurations										
Traffic Vol, veh/h	90	41	0	553	6	15	0	358	0	0
Future Vol, veh/h	90	41	0	553	6	15	0	358	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	None	-	-	None	-	-
Storage Length	0	-	-	-	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	-		-16979		-16979	-
Grade, %	0	-	-	0	-	-	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	98	45	0	601	7	16	0	389	0	0

Major/Minor	Minor1		Major1		
Conflicting Flow All	605	605	-	0	0
Stage 1	605	-	-	-	-
Stage 2	0	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	-
Pot Cap-1 Maneuver	461	498	0	-	-
Stage 1	545	-	0	-	-
Stage 2	-	-	0	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	461	498	-	-	-
Mov Cap-2 Maneuver	461	-	-	-	-
Stage 1	545	-	-	-	-
Stage 2	-	-	-	-	-

Approach	WB	NB
HCM Control Delay, s	15.9	0
HCM LOS	C	

Minor Lane/Major Mvmt	NBT	NBR	WBLn1
Capacity (veh/h)	-	-	472
HCM Lane V/C Ratio	-	-	0.302
HCM Control Delay (s)	-	-	15.9
HCM Lane LOS	-	-	C
HCM 95th %tile Q(veh)	-	-	1.3

Intersection	
Int Delay, s/veh	6.8

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	16	114	0	0	16
Future Vol, veh/h	4	16	114	0	0	16
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	4	17	124	0	0	17

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	257	9	17	0	-	0
Stage 1	9	-	-	-	-	-
Stage 2	248	-	-	-	-	-
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	732	1073	1600	-	-	-
Stage 1	1014	-	-	-	-	-
Stage 2	793	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	676	1073	1600	-	-	-
Mov Cap-2 Maneuver	676	-	-	-	-	-
Stage 1	936	-	-	-	-	-
Stage 2	793	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.8	7.4	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1600	-	960	-	-
HCM Lane V/C Ratio	0.077	-	0.023	-	-
HCM Control Delay (s)	7.4	0	8.8	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.3	-	0.1	-	-

Intersection	
Int Delay, s/veh	1

Movement	WBL	WBR	SEL	SET	NWT	NWR
Lane Configurations						
Traffic Vol, veh/h	0	4	1	26	11	0
Future Vol, veh/h	0	4	1	26	11	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	0	4	1	28	12	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	42	12	12	0	-	0
Stage 1	12	-	-	-	-	-
Stage 2	30	-	-	-	-	-
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	969	1069	1607	-	-	-
Stage 1	1011	-	-	-	-	-
Stage 2	993	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	968	1069	1607	-	-	-
Mov Cap-2 Maneuver	968	-	-	-	-	-
Stage 1	1010	-	-	-	-	-
Stage 2	993	-	-	-	-	-

Approach	WB	SE	NW
HCM Control Delay, s	8.4	0.3	0
HCM LOS	A		

Minor Lane/Major Mvmt	NWT	NWR	WBLn1	SEL	SET
Capacity (veh/h)	-	-	1069	1607	-
HCM Lane V/C Ratio	-	-	0.004	0.001	-
HCM Control Delay (s)	-	-	8.4	7.2	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR	NWL	NWR
Lane Configurations								
Traffic Vol, veh/h	2	0	6	11	0	0	123	1
Future Vol, veh/h	2	0	6	11	0	0	123	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	-	-	None	-	-	-	None
Storage Length	-	-	200	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	16974	-	0	-
Grade, %	0	-	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2
Mvmt Flow	2	0	7	12	0	0	134	1

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	815	0	26	0
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	26	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	812	-	989	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	997	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	812	-	979	-
Mov Cap-2 Maneuver	-	-	-	-	979	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	997	-

Approach	EB	WB	NW
HCM Control Delay, s	0	3.3	
HCM LOS			-

Minor Lane/Major Mvmt	NWLn1	EBT	EBR	EBR2	WBL	WBT
Capacity (veh/h)	-	1607	-	-	812	-
HCM Lane V/C Ratio	-	0.001	-	-	0.008	-
HCM Control Delay (s)	-	7.2	-	-	9.5	-
HCM Lane LOS	-	A	-	-	A	-
HCM 95th %tile Q(veh)	-	0	-	-	0	-

Intersection	
Int Delay, s/veh	7.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	751	62	3	131	0	0	0	0	2	2	853
Future Vol, veh/h	0	751	62	3	131	0	0	0	0	2	2	853
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	275	-	-	-	-	-	-	-	325
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	816	67	3	142	0	0	0	0	2	2	927

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	-	0	0	883	0	0				998	1031	142
Stage 1	-	-	-	-	-	-				148	148	-
Stage 2	-	-	-	-	-	-				850	883	-
Critical Hdwy	-	-	-	4.12	-	-				6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-				5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.42	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-				3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	766	-	0				270	233	~ 906
Stage 1	0	-	-	-	-	0				880	775	-
Stage 2	0	-	-	-	-	0				419	364	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	766	-	-				269	0	~ 906
Mov Cap-2 Maneuver	-	-	-	-	-	-				269	0	-
Stage 1	-	-	-	-	-	-				876	0	-
Stage 2	-	-	-	-	-	-				419	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0.2	15
HCM LOS			C

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	-	-	766	-	891	906
HCM Lane V/C Ratio	-	-	0.004	-	0.352	0.682
HCM Control Delay (s)	-	-	9.7	-	11.2	17
HCM Lane LOS	-	-	A	-	B	C
HCM 95th %tile Q(veh)	-	-	0	-	1.6	5.6

Notes

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

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	3	0	0	0	0	17
Future Vol, veh/h	3	0	0	0	0	17
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	3	0	0	0	0	18

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	9	9	18	0	-	0
Stage 1	9	-	-	-	-	-
Stage 2	0	-	-	-	-	-
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	1011	1073	1599	-	-	-
Stage 1	1014	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	1011	1073	1599	-	-	-
Mov Cap-2 Maneuver	1011	-	-	-	-	-
Stage 1	1014	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB		NB		SB
HCM Control Delay, s	8.6		0		0
HCM LOS	A				

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1599	-	1011	-	-
HCM Lane V/C Ratio	-	-	0.003	-	-
HCM Control Delay (s)	0	-	8.6	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	135	0	59	784	0	0	0	0	51	0	165
Future Vol, veh/h	0	135	0	59	784	0	0	0	0	51	0	165
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Free
Storage Length	-	-	-	-	-	-	-	-	-	0	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	147	0	64	852	0	0	0	0	55	0	179

Major/Minor	Major1			Major2			Minor2		
Conflicting Flow All	-	0	-	147	0	0	1127	-	-
Stage 1	-	-	-	-	-	-	980	-	-
Stage 2	-	-	-	-	-	-	147	-	-
Critical Hdwy	-	-	-	4.12	-	-	6.42	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	5.42	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.42	-	-
Follow-up Hdwy	-	-	-	2.218	-	-	3.518	-	-
Pot Cap-1 Maneuver	0	-	0	1435	-	0	226	0	0
Stage 1	0	-	0	-	-	0	364	0	0
Stage 2	0	-	0	-	-	0	880	0	0
Platoon blocked, %		-			-				
Mov Cap-1 Maneuver	-	-	-	1435	-	-	207	0	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	207	0	-
Stage 1	-	-	-	-	-	-	333	0	-
Stage 2	-	-	-	-	-	-	880	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0.5	28.6
HCM LOS			D

Minor Lane/Major Mvmt	EBT	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	-	1435	-	207	-
HCM Lane V/C Ratio	-	0.045	-	0.268	-
HCM Control Delay (s)	-	7.6	0	28.6	0
HCM Lane LOS	-	A	A	D	A
HCM 95th %tile Q(veh)	-	0.1	-	1	-

Intersection	
Int Delay, s/veh	21.3

Movement	WBL	WBR	NBL	NBT	NBR	SBL	SBT	SBR	NEL	NER
Lane Configurations										
Traffic Vol, veh/h	7	576	0	271	2	56	0	120	0	0
Future Vol, veh/h	7	576	0	271	2	56	0	120	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	-	None	-	-	None	-	-
Storage Length	0	-	-	-	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	-	-	16979	-	16979	-
Grade, %	0	-	-	0	-	-	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	626	0	295	2	61	0	130	0	0

Major/Minor	Minor1		Major1		
Conflicting Flow All	296	296	-	0	0
Stage 1	296	-	-	-	-
Stage 2	0	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	-
Pot Cap-1 Maneuver	695	743	0	-	-
Stage 1	755	-	0	-	-
Stage 2	-	-	0	-	-
Platoon blocked, %				-	-
Mov Cap-1 Maneuver	695	743	-	-	-
Mov Cap-2 Maneuver	695	-	-	-	-
Stage 1	755	-	-	-	-
Stage 2	-	-	-	-	-

Approach	WB	NB
HCM Control Delay, s	31.3	0
HCM LOS	D	

Minor Lane/Major Mvmt	NBT	NBR	WBLn1
Capacity (veh/h)	-	-	742
HCM Lane V/C Ratio	-	-	0.854
HCM Control Delay (s)	-	-	31.3
HCM Lane LOS	-	-	D
HCM 95th %tile Q(veh)	-	-	10.1

Intersection	
Int Delay, s/veh	8.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	59	583	0	0	0
Future Vol, veh/h	0	59	583	0	0	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	0	64	634	0	0	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1269	1	1	0	-	0
Stage 1	1	-	-	-	-	-
Stage 2	1268	-	-	-	-	-
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	186	1084	1622	-	-	-
Stage 1	1022	-	-	-	-	-
Stage 2	265	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	113	1084	1622	-	-	-
Mov Cap-2 Maneuver	113	-	-	-	-	-
Stage 1	622	-	-	-	-	-
Stage 2	265	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.5	8.6	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1622	-	1084	-	-
HCM Lane V/C Ratio	0.391	-	0.059	-	-
HCM Control Delay (s)	8.6	0	8.5	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	1.9	-	0.2	-	-

Intersection						
Int Delay, s/veh	67.5					

Movement	WBL	WBR	SEL	SET	NWT	NWR
Lane Configurations						
Traffic Vol, veh/h	329	311	29	31	316	33
Future Vol, veh/h	329	311	29	31	316	33
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	358	338	32	34	343	36

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	459	361	379	0	-	0
Stage 1	361	-	-	-	-	-
Stage 2	98	-	-	-	-	-
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	560	684	1179	-	-	-
Stage 1	705	-	-	-	-	-
Stage 2	926	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	544	684	1179	-	-	-
Mov Cap-2 Maneuver	544	-	-	-	-	-
Stage 1	685	-	-	-	-	-
Stage 2	926	-	-	-	-	-

Approach	WB	SE	NW
HCM Control Delay, s	110.3	3.9	0
HCM LOS	F		

Minor Lane/Major Mvmt	NWT	NWR	WBLn1	SEL	SET
Capacity (veh/h)	-	-	604	1179	-
HCM Lane V/C Ratio	-	-	1.152	0.027	-
HCM Control Delay (s)	-	-	110.3	8.1	0
HCM Lane LOS	-	-	F	A	A
HCM 95th %tile Q(veh)	-	-	22.9	0.1	-

Intersection	
Int Delay, s/veh	2.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR	NWL	NWR
Lane Configurations								
Traffic Vol, veh/h	19	0	214	123	0	0	47	22
Future Vol, veh/h	19	0	214	123	0	0	47	22
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	-	-	None	-	-	-	None
Storage Length	-	-	200	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	16974	-	0	-
Grade, %	0	-	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2
Mvmt Flow	21	0	233	134	0	0	51	24

Major/Minor	Major1		Major2				Minor1	
Conflicting Flow All	0	0	293	0			600	0
Stage 1	-	-	-	-			0	-
Stage 2	-	-	-	-			600	-
Critical Hdwy	-	-	4.12	-			6.42	6.22
Critical Hdwy Stg 1	-	-	-	-			-	-
Critical Hdwy Stg 2	-	-	-	-			5.42	-
Follow-up Hdwy	-	-	2.218	-			3.518	3.318
Pot Cap-1 Maneuver	-	-	1269	-			464	-
Stage 1	-	-	-	-			-	-
Stage 2	-	-	-	-			548	-
Platoon blocked, %	-	-		-				
Mov Cap-1 Maneuver	-	-	1269	-			374	-
Mov Cap-2 Maneuver	-	-	-	-			374	-
Stage 1	-	-	-	-			-	-
Stage 2	-	-	-	-			548	-

Approach	EB	WB	NW
HCM Control Delay, s	0.5	5.4	
HCM LOS			-

Minor Lane/Major Mvmt	NWLn1	EBT	EBR	EBR2	WBL	WBT
Capacity (veh/h)	-	1451	-	-	1269	-
HCM Lane V/C Ratio	-	0.014	-	-	0.183	-
HCM Control Delay (s)	-	7.5	-	-	8.5	-
HCM Lane LOS	-	A	-	-	A	-
HCM 95th %tile Q(veh)	-	0	-	-	0.7	-

Intersection	
Int Delay, s/veh	6.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	251	19	2	170	0	0	0	0	36	3	481
Future Vol, veh/h	0	251	19	2	170	0	0	0	0	36	3	481
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	275	-	-	-	-	-	-	-	325
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	273	21	2	185	0	0	0	0	39	3	523

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	-	0	0	294	0	0				473	483	185
Stage 1	-	-	-	-	-	-				189	189	-
Stage 2	-	-	-	-	-	-				284	294	-
Critical Hdwy	-	-	-	4.12	-	-				6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-				5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.42	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-				3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	1268	-	0				550	483	857
Stage 1	0	-	-	-	-	0				843	744	-
Stage 2	0	-	-	-	-	0				764	670	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	1268	-	-				549	0	857
Mov Cap-2 Maneuver	-	-	-	-	-	-				549	0	-
Stage 1	-	-	-	-	-	-				841	0	-
Stage 2	-	-	-	-	-	-				764	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0.1	11.8
HCM LOS			B

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	-	-	1268	-	777	857
HCM Lane V/C Ratio	-	-	0.002	-	0.279	0.407
HCM Control Delay (s)	-	-	7.8	-	11.4	12.1
HCM Lane LOS	-	-	A	-	B	B
HCM 95th %tile Q(veh)	-	-	0	-	1.1	2

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	33	0	0	0	0	328
Future Vol, veh/h	33	0	0	0	0	328
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	36	0	0	0	0	357

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	179	179	357	0	-	0
Stage 1	179	-	-	-	-	-
Stage 2	0	-	-	-	-	-
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	811	864	1202	-	-	-
Stage 1	852	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	811	864	1202	-	-	-
Mov Cap-2 Maneuver	811	-	-	-	-	-
Stage 1	852	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.6	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1202	-	811	-	-
HCM Lane V/C Ratio	-	-	0.044	-	-
HCM Control Delay (s)	0	-	9.6	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	514	0	11	452	0	0	0	0	44	0	487
Future Vol, veh/h	0	514	0	11	452	0	0	0	0	44	0	487
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Free
Storage Length	-	-	-	-	-	-	-	-	-	0	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	559	0	12	491	0	0	0	0	48	0	529

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	-	0	-	559	0	0				1074	-	-
Stage 1	-	-	-	-	-	-				515	-	-
Stage 2	-	-	-	-	-	-				559	-	-
Critical Hdwy	-	-	-	4.12	-	-				6.42	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-				5.42	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.42	-	-
Follow-up Hdwy	-	-	-	2.218	-	-				3.518	-	-
Pot Cap-1 Maneuver	0	-	0	1012	-	0				243	0	0
Stage 1	0	-	0	-	-	0				600	0	0
Stage 2	0	-	0	-	-	0				572	0	0
Platoon blocked, %		-			-							
Mov Cap-1 Maneuver	-	-	-	1012	-	-				239	0	-
Mov Cap-2 Maneuver	-	-	-	-	-	-				239	0	-
Stage 1	-	-	-	-	-	-				590	0	-
Stage 2	-	-	-	-	-	-				572	0	-

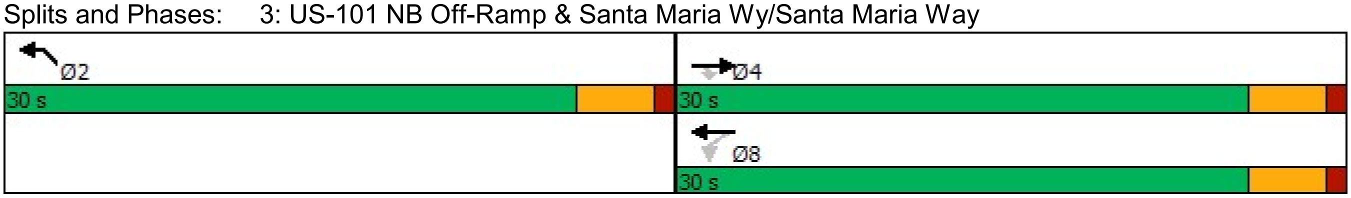
Approach	EB	WB	SB
HCM Control Delay, s	0	0.2	23.8
HCM LOS			C

Minor Lane/Major Mvmt	EBT	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	-	1012	-	239	-
HCM Lane V/C Ratio	-	0.012	-	0.2	-
HCM Control Delay (s)	-	8.6	0	23.8	0
HCM Lane LOS	-	A	A	C	A
HCM 95th %tile Q(veh)	-	0	-	0.7	-

Lane Group	EBT	EBR2	WBL	WBT	NWL
Lane Configurations					
Traffic Volume (vph)	70	318	30	28	361
Future Volume (vph)	70	318	30	28	361
Turn Type	NA	Perm	Perm	NA	Prot
Protected Phases	4			8	2
Permitted Phases		4	8		
Detector Phase	4	4	8	8	2
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5
Total Split (s)	30.0	30.0	30.0	30.0	30.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	None	None	Min
Act Effct Green (s)	7.9	7.9	7.9	7.9	12.8
Actuated g/C Ratio	0.26	0.26	0.26	0.26	0.43
v/c Ratio	0.16	0.52	0.10	0.06	0.54
Control Delay	9.6	4.7	9.5	9.0	9.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	9.6	4.7	9.5	9.0	9.5
LOS	A	A	A	A	A
Approach Delay	5.6			9.3	9.5
Approach LOS	A			A	A

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 30	
Natural Cycle: 45	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.54	
Intersection Signal Delay: 7.7	Intersection LOS: A
Intersection Capacity Utilization 37.1%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 3: US-101 NB Off-Ramp & Santa Maria Wy/Santa Maria Way



Intersection	
Int Delay, s/veh	7.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	94	55	5	3	2
Future Vol, veh/h	2	94	55	5	3	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	102	60	5	3	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	129	4	5	0	-	0
Stage 1	4	-	-	-	-	-
Stage 2	125	-	-	-	-	-
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	865	1080	1616	-	-	-
Stage 1	1019	-	-	-	-	-
Stage 2	901	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	833	1080	1616	-	-	-
Mov Cap-2 Maneuver	833	-	-	-	-	-
Stage 1	981	-	-	-	-	-
Stage 2	901	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.7	6.7	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1616	-	1073	-	-
HCM Lane V/C Ratio	0.037	-	0.097	-	-
HCM Control Delay (s)	7.3	0	8.7	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.3	-	-

Intersection						
Int Delay, s/veh	3.9					

Movement	WBL	WBR	SEL	SET	NWT	NWR
Lane Configurations						
Traffic Vol, veh/h	0	2	2	3	1	0
Future Vol, veh/h	0	2	2	3	1	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	0	2	2	3	1	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	8	1	1	0	-	0
Stage 1	1	-	-	-	-	-
Stage 2	7	-	-	-	-	-
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	1013	1084	1622	-	-	-
Stage 1	1022	-	-	-	-	-
Stage 2	1016	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	1012	1084	1622	-	-	-
Mov Cap-2 Maneuver	1012	-	-	-	-	-
Stage 1	1021	-	-	-	-	-
Stage 2	1016	-	-	-	-	-

Approach	WB	SE	NW
HCM Control Delay, s	8.3	2.9	0
HCM LOS	A		

Minor Lane/Major Mvmt	NWT	NWR	WBLn1	SEL	SET
Capacity (veh/h)	-	-	1084	1622	-
HCM Lane V/C Ratio	-	-	0.002	0.001	-
HCM Control Delay (s)	-	-	8.3	7.2	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	4.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	965	118	2	94	0	0	0	0	1	4	670
Future Vol, veh/h	0	965	118	2	94	0	0	0	0	1	4	670
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	275	-	-	-	-	-	-	-	325
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1049	128	2	102	0	0	0	0	1	4	728

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	-	0	0	1177	0	0				1219	1283	102
Stage 1	-	-	-	-	-	-				106	106	-
Stage 2	-	-	-	-	-	-				1113	1177	-
Critical Hdwy	-	-	-	4.12	-	-				6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-				5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.42	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-				3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	593	-	0				199	165	953
Stage 1	0	-	-	-	-	0				918	807	-
Stage 2	0	-	-	-	-	0				314	265	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	593	-	-				198	0	953
Mov Cap-2 Maneuver	-	-	-	-	-	-				198	0	-
Stage 1	-	-	-	-	-	-				915	0	-
Stage 2	-	-	-	-	-	-				314	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0.2	11.8
HCM LOS			B

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	-	-	593	-	937	953
HCM Lane V/C Ratio	-	-	0.004	-	0.265	0.509
HCM Control Delay (s)	-	-	11.1	-	10.2	12.6
HCM Lane LOS	-	-	B	-	B	B
HCM 95th %tile Q(veh)	-	-	0	-	1.1	3

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	408	0	11	542	0	0	0	0	22	0	507
Future Vol, veh/h	0	408	0	11	542	0	0	0	0	22	0	507
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Free
Storage Length	-	-	-	-	-	-	-	-	-	0	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	443	0	12	589	0	0	0	0	24	0	551

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	-	0	-	443	0	0				1056	-	-
Stage 1	-	-	-	-	-	-				613	-	-
Stage 2	-	-	-	-	-	-				443	-	-
Critical Hdwy	-	-	-	4.12	-	-				6.42	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-				5.42	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.42	-	-
Follow-up Hdwy	-	-	-	2.218	-	-				3.518	-	-
Pot Cap-1 Maneuver	0	-	0	1117	-	0				250	0	0
Stage 1	0	-	0	-	-	0				541	0	0
Stage 2	0	-	0	-	-	0				647	0	0
Platoon blocked, %		-			-							
Mov Cap-1 Maneuver	-	-	-	1117	-	-				246	0	-
Mov Cap-2 Maneuver	-	-	-	-	-	-				246	0	-
Stage 1	-	-	-	-	-	-				532	0	-
Stage 2	-	-	-	-	-	-				647	0	-

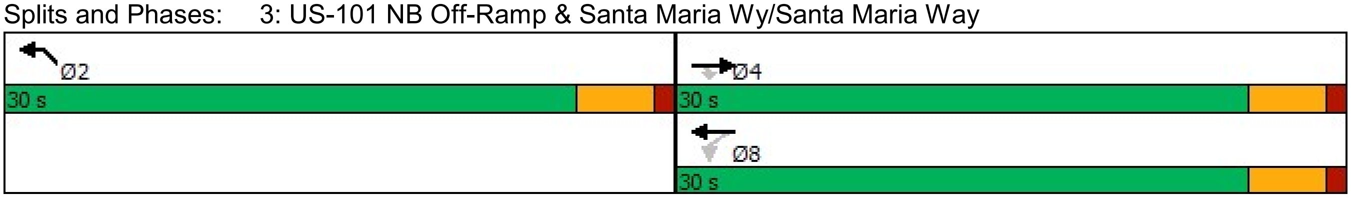
Approach	EB	WB	SB
HCM Control Delay, s	0	0.2	21.2
HCM LOS			C

Minor Lane/Major Mvmt	EBT	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	-	1117	-	246	-
HCM Lane V/C Ratio	-	0.011	-	0.097	-
HCM Control Delay (s)	-	8.3	0	21.2	0
HCM Lane LOS	-	A	A	C	A
HCM 95th %tile Q(veh)	-	0	-	0.3	-

Lane Group	EBT	EBR2	WBL	WBT	NWL
Lane Configurations					
Traffic Volume (vph)	18	358	90	41	553
Future Volume (vph)	18	358	90	41	553
Turn Type	NA	Perm	Perm	NA	Prot
Protected Phases	4			8	2
Permitted Phases		4	8		
Detector Phase	4	4	8	8	2
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5
Total Split (s)	30.0	30.0	30.0	30.0	30.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	None	None	Min
Act Effct Green (s)	8.7	8.7	8.7	8.7	17.7
Actuated g/C Ratio	0.24	0.24	0.24	0.24	0.49
v/c Ratio	0.04	0.57	0.29	0.10	0.69
Control Delay	11.9	5.8	14.5	12.2	11.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	11.9	5.8	14.5	12.2	11.8
LOS	B	A	B	B	B
Approach Delay	6.1			13.8	11.8
Approach LOS	A			B	B

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 35.8	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.69	
Intersection Signal Delay: 10.0	Intersection LOS: B
Intersection Capacity Utilization 50.3%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 3: US-101 NB Off-Ramp & Santa Maria Wy/Santa Maria Way



Intersection	
Int Delay, s/veh	6.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	21	114	0	0	16
Future Vol, veh/h	4	21	114	0	0	16
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	4	23	124	0	0	17

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	257	9	17	0	-	0
Stage 1	9	-	-	-	-	-
Stage 2	248	-	-	-	-	-
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	732	1073	1600	-	-	-
Stage 1	1014	-	-	-	-	-
Stage 2	793	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	676	1073	1600	-	-	-
Mov Cap-2 Maneuver	676	-	-	-	-	-
Stage 1	936	-	-	-	-	-
Stage 2	793	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.8	7.4	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1600	-	981	-	-
HCM Lane V/C Ratio	0.077	-	0.028	-	-
HCM Control Delay (s)	7.4	0	8.8	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.3	-	0.1	-	-

Intersection	
Int Delay, s/veh	3.7

Movement	WBL	WBR	SEL	SET	NWT	NWR
Lane Configurations						
Traffic Vol, veh/h	0	4	1	0	6	0
Future Vol, veh/h	0	4	1	0	6	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	0	4	1	0	7	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	9	7	7	0	-	0
Stage 1	7	-	-	-	-	-
Stage 2	2	-	-	-	-	-
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	1011	1075	1614	-	-	-
Stage 1	1016	-	-	-	-	-
Stage 2	1021	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	1010	1075	1614	-	-	-
Mov Cap-2 Maneuver	1010	-	-	-	-	-
Stage 1	1015	-	-	-	-	-
Stage 2	1021	-	-	-	-	-

Approach	WB	SE	NW
HCM Control Delay, s	8.4	7.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NWT	NWR	WBLn1	SEL	SET
Capacity (veh/h)	-	-	1075	1614	-
HCM Lane V/C Ratio	-	-	0.004	0.001	-
HCM Control Delay (s)	-	-	8.4	7.2	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	749	62	3	120	0	0	0	0	2	2	853
Future Vol, veh/h	0	749	62	3	120	0	0	0	0	2	2	853
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	275	-	-	-	-	-	-	-	325
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	814	67	3	130	0	0	0	0	2	2	927

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	-	0	0	881	0	0				984	1017	130
Stage 1	-	-	-	-	-	-				136	136	-
Stage 2	-	-	-	-	-	-				848	881	-
Critical Hdwy	-	-	-	4.12	-	-				6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-				5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.42	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-				3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	767	-	0				275	238	~ 920
Stage 1	0	-	-	-	-	0				890	784	-
Stage 2	0	-	-	-	-	0				420	365	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	767	-	-				274	0	~ 920
Mov Cap-2 Maneuver	-	-	-	-	-	-				274	0	-
Stage 1	-	-	-	-	-	-				886	0	-
Stage 2	-	-	-	-	-	-				420	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0.2	14.7
HCM LOS			B

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	-	-	767	-	905	920
HCM Lane V/C Ratio	-	-	0.004	-	0.346	0.672
HCM Control Delay (s)	-	-	9.7	-	11.1	16.5
HCM Lane LOS	-	-	A	-	B	C
HCM 95th %tile Q(veh)	-	-	0	-	1.6	5.4

Notes

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

Intersection	
Int Delay, s/veh	13.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	144	0	296	875	0	0	0	0	51	0	165
Future Vol, veh/h	0	144	0	296	875	0	0	0	0	51	0	165
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	Free
Storage Length	-	-	-	-	-	-	-	-	-	0	-	50
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	157	0	322	951	0	0	0	0	55	0	179

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	-	0	-	157	0	0				1752	-	-
Stage 1	-	-	-	-	-	-				1595	-	-
Stage 2	-	-	-	-	-	-				157	-	-
Critical Hdwy	-	-	-	4.12	-	-				6.42	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-				5.42	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.42	-	-
Follow-up Hdwy	-	-	-	2.218	-	-				3.518	-	-
Pot Cap-1 Maneuver	0	-	0	1423	-	0				94	0	0
Stage 1	0	-	0	-	-	0				183	0	0
Stage 2	0	-	0	-	-	0				871	0	0
Platoon blocked, %		-			-							
Mov Cap-1 Maneuver	-	-	-	1423	-	-				~ 49	0	-
Mov Cap-2 Maneuver	-	-	-	-	-	-				~ 49	0	-
Stage 1	-	-	-	-	-	-				95	0	-
Stage 2	-	-	-	-	-	-				871	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	2.1	$ 303.7
HCM LOS			F

Minor Lane/Major Mvmt	EBT	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	-	1423	-	49	-
HCM Lane V/C Ratio	-	0.226	-	1.131	-
HCM Control Delay (s)	-	8.3	0	$ 303.7	0
HCM Lane LOS	-	A	A	F	A
HCM 95th %tile Q(veh)	-	0.9	-	5	-

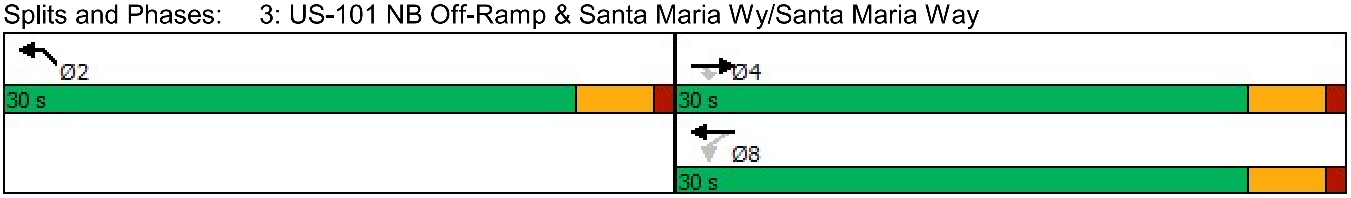
Notes

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

Lane Group	EBT	EBR2	WBL	WBT	NWL
Lane Configurations					
Traffic Volume (vph)	65	120	7	904	271
Future Volume (vph)	65	120	7	904	271
Turn Type	NA	Perm	Perm	NA	Prot
Protected Phases	4			8	2
Permitted Phases		4	8		
Detector Phase	4	4	8	8	2
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5
Total Split (s)	30.0	30.0	30.0	30.0	30.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	None	None	Min
Act Effct Green (s)	25.7	25.7	25.7	25.7	13.2
Actuated g/C Ratio	0.54	0.54	0.54	0.54	0.28
v/c Ratio	0.07	0.14	0.01	0.99	0.64
Control Delay	6.9	2.4	6.9	41.8	20.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	6.9	2.4	6.9	41.8	20.0
LOS	A	A	A	D	C
Approach Delay	4.0			41.5	20.0
Approach LOS	A			D	C

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 47.9	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.99	
Intersection Signal Delay: 32.0	Intersection LOS: C
Intersection Capacity Utilization 71.7%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 3: US-101 NB Off-Ramp & Santa Maria Wy/Santa Maria Way



Intersection						
Int Delay, s/veh	10.4					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	92	911	0	0	0
Future Vol, veh/h	0	92	911	0	0	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	0	100	990	0	0	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1981	1	1	0	-	0
Stage 1	1	-	-	-	-	-
Stage 2	1980	-	-	-	-	-
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	68	1084	1622	-	-	-
Stage 1	1022	-	-	-	-	-
Stage 2	117	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	27	1084	1622	-	-	-
Mov Cap-2 Maneuver	27	-	-	-	-	-
Stage 1	399	-	-	-	-	-
Stage 2	117	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.7	10.6	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1622	-	1084	-	-
HCM Lane V/C Ratio	0.61	-	0.092	-	-
HCM Control Delay (s)	10.6	0	8.7	-	-
HCM Lane LOS	B	A	A	-	-
HCM 95th %tile Q(veh)	4.5	-	0.3	-	-

Intersection						
Int Delay, s/veh	22.1					

Movement	WBL	WBR	SEL	SET	NWT	NWR
Lane Configurations						
Traffic Vol, veh/h	1	459	44	49	496	0
Future Vol, veh/h	1	459	44	49	496	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	1	499	48	53	539	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	688	539	539	0	-	0
Stage 1	539	-	-	-	-	-
Stage 2	149	-	-	-	-	-
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	412	542	1029	-	-	-
Stage 1	585	-	-	-	-	-
Stage 2	879	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	392	542	1029	-	-	-
Mov Cap-2 Maneuver	392	-	-	-	-	-
Stage 1	557	-	-	-	-	-
Stage 2	879	-	-	-	-	-

Approach	WB	SE	NW
HCM Control Delay, s	49.5	4.1	0
HCM LOS	E		

Minor Lane/Major Mvmt	NWT	NWR	WBLn1	SEL	SET
Capacity (veh/h)	-	-	542	1029	-
HCM Lane V/C Ratio	-	-	0.923	0.046	-
HCM Control Delay (s)	-	-	49.5	8.7	0
HCM Lane LOS	-	-	E	A	A
HCM 95th %tile Q(veh)	-	-	11.3	0.1	-

Intersection	
Int Delay, s/veh	6.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	242	19	2	52	0	0	0	0	36	3	481
Future Vol, veh/h	0	242	19	2	52	0	0	0	0	36	3	481
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	275	-	-	-	-	-	-	-	325
Veh in Median Storage, #	-	0	-	-	0	-	-	16974	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	263	21	2	57	0	0	0	0	39	3	523

Major/Minor	Major1			Major2						Minor2		
Conflicting Flow All	-	0	0	284	0	0				335	345	57
Stage 1	-	-	-	-	-	-				61	61	-
Stage 2	-	-	-	-	-	-				274	284	-
Critical Hdwy	-	-	-	4.12	-	-				6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-				5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.42	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-				3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	1278	-	0				660	578	1009
Stage 1	0	-	-	-	-	0				962	844	-
Stage 2	0	-	-	-	-	0				772	676	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	1278	-	-				659	0	1009
Mov Cap-2 Maneuver	-	-	-	-	-	-				659	0	-
Stage 1	-	-	-	-	-	-				960	0	-
Stage 2	-	-	-	-	-	-				772	0	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0.3	10.3
HCM LOS			B

Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1	SBLn2
Capacity (veh/h)	-	-	1278	-	919	1009
HCM Lane V/C Ratio	-	-	0.002	-	0.236	0.345
HCM Control Delay (s)	-	-	7.8	-	10.1	10.4
HCM Lane LOS	-	-	A	-	B	B
HCM 95th %tile Q(veh)	-	-	0	-	0.9	1.6

Appendix E – ICU Spreadsheets and Synchro Reports – Long Term (2040)

E-W Street: Santa Maria Wy
N-S Street: College Dr/Bradley Rd
Scenario: AM Peak
Right Turn Reduce 30%
Lane Capacity: 1600
Dual Lefts Capacity (per lane): 1600

	AM 2040 without Project				AM 2040 + Project			
Movement	Total Volume	No. of Lanes	Equivalent Lanes	Movement V/C	Total Volume	No. of Lanes	Equivalent Lanes	Movement V/C
EB Left	74	1	1.00	0.05	74	1	1.00	0.05
Comb. L-T								
EB Thru	371	2	2.00	0.12	325	2	2.00	0.10
Comb. T-R								
EB Right	186	1	1.00	0.12	186	1	1.00	0.12
Comb. L-T-R								
WB Left	502	1	1.00	0.31	488	1	1.00	0.31
Comb. L-T								
WB Thru	469	1	1.67	0.18	427	1	1.64	0.16
Comb. T-R		1				1		
WB Right	93		0.33	0.18	93		0.36	0.16
Comb. L-T-R								
NB Left	325	1	1.02	0.20	325	1	1.02	0.20
Comb. L-T		1				1		
NB Thru	310	1	1.98	0.10	310	1	1.98	0.10
Comb. T-R								
NB Right	474	1	1.00	0.00	459	1	1.00	0.00
Comb. L-T-R								
SB Left	115	1	1.00	0.07	115	1	1.00	0.07
Comb. L-T								
SB Thru	259	1	1.69	0.10	259	1	1.69	0.10
Comb. T-R		1				1		
SB Right	47		0.31	0.10	47		0.31	0.10
Comb. L-T-R								

Critical Volumes	E-W:	0.43	E-W:	0.42
	N-S:	0.29	N-S:	0.29
	Total:	0.72	Total:	0.72

Lost Time	0.10	0.10

V/C	0.824	0.815
Level of Service	D	D

E-W Street: Santa Maria Wy
N-S Street: College Dr/Bradley Rd
Scenario: AM Peak — Right Turn Reduce 30%
Lane Capacity: 1600
Dual Lefts Capacity (per lane): 1600

Movement	PM 2040 without Project				PM 2040 + Project			
	Total Volume	No. of Lanes	Equivalent Lanes	Movement V/C	Total Volume	No. of Lanes	Equivalent Lanes	Movement V/C
EB Left	69	1	1.00	0.04	69	1	1.00	0.04
Comb. L-T		0				0		
EB Thru	367	2	2.00	0.11	331	2	2.00	0.10
Comb. T-R		0				0		
EB Right	246	1	1.00	0.15	246	1	1.00	0.15
Comb. L-T-R		0				0		
WB Left	565	1	1.00	0.35	549	1	1.00	0.34
Comb. L-T		0				0		
WB Thru	449	1	1.54	0.18	401	1	1.49	0.17
Comb. T-R		1				1		
WB Right	136	0	0.46	0.18	136	0	0.51	0.17
Comb. L-T-R		0				0		
NB Left	261	1	0.84	0.19	261	1	0.84	0.19
Comb. L-T		1				1		
NB Thru	360	1	2.16	0.10	360	1	2.16	0.10
Comb. T-R		0				0		
NB Right	587	1	1.00	0.00	575	1	1.00	0.00
Comb. L-T-R		0				0		
SB Left	113	1	1.00	0.07	113	1	1.00	0.07
Comb. L-T		0				0		
SB Thru	448	1	1.82	0.15	448	1	1.82	0.15
Comb. T-R		1				1		
SB Right	44	0	0.18	0.15	44	0	0.18	0.15
Comb. L-T-R		0				0		

Critical Volumes	E-W:	0.51	E-W:	0.50
	N-S:	0.35	N-S:	0.35
	Total:	0.85	Total:	0.84
Lost Time		0.10		0.10
V/C		0.955		0.945
Level of Service		E		E

P Santa Maria Wy
N-S Street: College Dr/Bradley Rd
Scenario: AM Peak | Right Turn Reduce 30%
Lane Capacity: 1600
Dual Lefts Capacity (per lane): 1600

Movement	Sat Night 2040 without Project				Sat Night 2040 + Project			
	Total Volume	No. of Lanes	Equivalent Lanes	Movement V/C	Total Volume	No. of Lanes	Equivalent Lanes	Movement V/C
EB Left	103	1	1.00	0.06	103	1	1.00	0.06
Comb. L-T		0				0		
EB Thru	245	2	2.00	0.08	219	2	2.00	0.07
Comb. T-R		0				0		
EB Right	133	1	1.00	0.08	133	1	1.00	0.08
Comb. L-T-R		0				0		
WB Left	184	1	1.00	0.12	184	1	1.00	0.12
Comb. L-T		0				0		
WB Thru	235	1	1.74	0.08	122	1	1.55	0.05
Comb. T-R		1				1		
WB Right	35	0	0.26	0.08	35	0	0.45	0.05
Comb. L-T-R		0				0		
NB Left	226	1	0.71	0.20	226	1	0.71	0.20
Comb. L-T		1				1		
NB Thru	407	1	2.29	0.11	407	1	2.29	0.11
Comb. T-R		0				0		
NB Right	383	1	1.00	0.00	383	1	1.00	0.00
Comb. L-T-R		0				0		
SB Left	47	1	1.00	0.03	47	1	1.00	0.03
Comb. L-T		0				0		
SB Thru	57	1	0.94	0.04	57	1	0.94	0.04
Comb. T-R		1				1		
SB Right	64	0	1.06	0.04	64	0	1.06	0.04
Comb. L-T-R		0				0		

Critical Volumes	E-W:	0.20	E-W:	0.20
	N-S:	0.24	N-S:	0.24
	Total:	0.43	Total:	0.43

Lost Time	0.10	0.10

V/C	0.534	0.534
Level of Service	A	A

E-W Street: Union Valley Pkwy
N-S Street: Bradley Rd
Scenario: AM Peak

Right Turn Reduce 30%

Lane Capacity: 1600
Dual Lefts Capacity (per lane): 1600

Movement	AM 2040 without Project				AM 2040 + Project			
	Total Volume	No. of Lanes	Equivalent Lanes	Movement V/C	Total Volume	No. of Lanes	Equivalent Lanes	Movement V/C
EB Left	30	2	2.00	0.01	30	2	2.00	0.01
Comb. L-T								
EB Thru	500	2	2.00	0.16	509	2	2.00	0.16
Comb. T-R								
EB Right	57	1	1.00	0.04	57	1	1.00	0.04
Comb. L-T-R								
WB Left	99	2	2.00	0.03	105	2	2.00	0.03
Comb. L-T								
WB Thru	431	2	2.00	0.13	439	2	2.00	0.14
Comb. T-R								
WB Right	19	1	1.00	0.01	33	1	1.00	0.02
Comb. L-T-R								
NB Left	117	1	1.00	0.07	117	1	1.00	0.07
Comb. L-T								
NB Thru	314	2	2.00	0.10	314	2	2.00	0.10
Comb. T-R								
NB Right	190	1	1.00	0.00	196	1	1.00	0.00
Comb. L-T-R								
SB Left	59	1	1.00	0.04	74	1	1.00	0.05
Comb. L-T								
SB Thru	170	1	1.68	0.06	170	1	1.68	0.06
Comb. T-R		1				1		
SB Right	32		0.32	0.06	32		0.32	0.06
Comb. L-T-R								

Critical Volumes	E-W:	0.19	E-W:	0.19
	N-S:	0.14	N-S:	0.14
	Total:	0.32	Total:	0.34

Lost Time	0.10	0.10

V/C	0.423	0.436
Level of Service	A	A

E-W Street: Union Valley Pkwy
N-S Street: Bradley Rd
Scenario: PM Peak

Right Turn Reduce 30%

Lane Capacity: 1600
Dual Lefts Capacity (per lane): 1600

Movement	PM 2040 without Project				PM 2040 + Project			
	Total Volume	No. of Lanes	Equivalent Lanes	Movement V/C	Total Volume	No. of Lanes	Equivalent Lanes	Movement V/C
EB Left	64	2	2.00	0.02	64	2	2.00	0.02
Comb. L-T		0				0		
EB Thru	564	2	2.00	0.18	571	2	2.00	0.18
Comb. T-R		0				0		
EB Right	175	1	1.00	0.11	175	1	1.00	0.11
Comb. L-T-R		0				0		
WB Left	233	2	2.00	0.07	239	2	2.00	0.07
Comb. L-T		0				0		
WB Thru	630	2	2.00	0.20	640	2	2.00	0.20
Comb. T-R		0				0		
WB Right	61	1	1.00	0.04	77	1	1.00	0.05
Comb. L-T-R		0				0		
NB Left	88	1	1.00	0.06	88	1	1.00	0.06
Comb. L-T		0				0		
NB Thru	395	2	2.00	0.12	395	2	2.00	0.12
Comb. T-R		0				0		
NB Right	138	1	1.00	0.00	143	1	1.00	0.00
Comb. L-T-R		0				0		
SB Left	47	1	1.00	0.03	59	1	1.00	0.04
Comb. L-T		0				0		
SB Thru	470	1	1.74	0.17	470	1	1.74	0.17
Comb. T-R		1				1		
SB Right	69	0	0.26	0.17	69	0	0.26	0.17
Comb. L-T-R		0				0		

Critical Volumes	E-W:	0.25	E-W:	0.25
	N-S:	0.22	N-S:	0.22
	Total:	0.47	Total:	0.48

Lost Time	0.10	0.10

V/C	0.573	0.577
Level of Service	A	A

E-W Street: Union Valley Pkwy
N-S Street: Bradley Rd
Scenario: Sat Event Exit Peak — Right Turn Reduce 30%
Lane Capacity: 1600
Dual Lefts Capacity (per lane): 1600

Movement	Sat Night 2040 without Project				Sat Night 2040 + Project			
	Total Volume	No. of Lanes	Equivalent Lanes	Movement V/C	Total Volume	No. of Lanes	Equivalent Lanes	Movement V/C
EB Left	19	2	2.00	0.01	19	2	2.00	0.01
Comb. L-T		0				0		
EB Thru	162	2	2.00	0.05	170	2	2.00	0.05
Comb. T-R		0				0		
EB Right	65	1	1.00	0.04	65	1	1.00	0.04
Comb. L-T-R		0				0		
WB Left	106	2	2.00	0.03	129	2	2.00	0.04
Comb. L-T		0				0		
WB Thru	343	2	2.00	0.11	377	2	2.00	0.12
Comb. T-R		0				0		
WB Right	43	1	1.00	0.03	99	1	1.00	0.06
Comb. L-T-R		0				0		
NB Left	36	1	1.00	0.02	36	1	1.00	0.02
Comb. L-T		0				0		
NB Thru	243	2	2.00	0.08	243	2	2.00	0.08
Comb. T-R		0				0		
NB Right	68	1	1.00	0.00	73	1	1.00	0.00
Comb. L-T-R		0				0		
SB Left	50	1	1.00	0.03	63	1	1.00	0.04
Comb. L-T		0				0		
SB Thru	189	1	1.64	0.07	189	1	1.64	0.07
Comb. T-R		1				1		
SB Right	41	0	0.36	0.07	41	0	0.36	0.07
Comb. L-T-R		0				0		

Critical Volumes	E-W:	0.11	E-W:	0.12
	N-S:	0.11	N-S:	0.12
	Total:	0.22	Total:	0.24

Lost Time	0.10	0.10

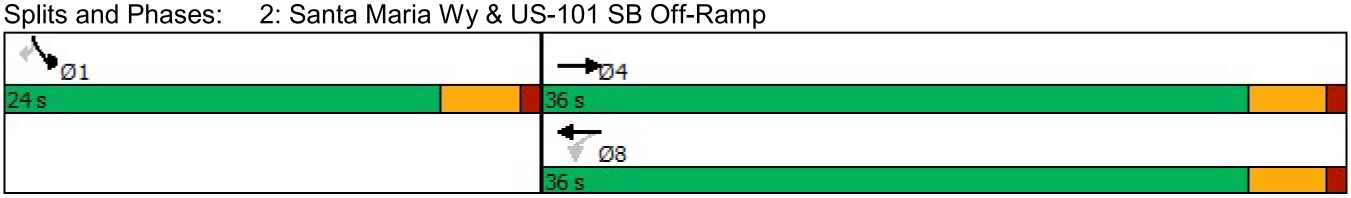
V/C	0.320	0.339
Level of Service	A	A

Lane Group	EBT	WBL	WBT	SBL	SBR
Lane Configurations					
Traffic Volume (vph)	613	51	541	132	517
Future Volume (vph)	613	51	541	132	517
Turn Type	NA	Perm	NA	Prot	Perm
Protected Phases	4		8	1	
Permitted Phases		8			1
Detector Phase	4	8	8	1	1
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	9.5	9.5
Total Split (s)	36.0	36.0	36.0	24.0	24.0
Total Split (%)	60.0%	60.0%	60.0%	40.0%	40.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.5		4.5	4.5	4.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	None	None	None
Act Effct Green (s)	25.0		25.0	15.9	15.9
Actuated g/C Ratio	0.50		0.50	0.31	0.31
v/c Ratio	0.72		0.85	0.26	0.84
Control Delay	15.7		24.4	15.8	23.3
Queue Delay	0.0		0.0	0.0	0.0
Total Delay	15.7		24.4	15.8	23.3
LOS	B		C	B	C
Approach Delay	15.7		24.4		
Approach LOS	B		C		

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 50.5
Natural Cycle: 60
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.85
Intersection Signal Delay: 20.6 Intersection LOS: C
Intersection Capacity Utilization 81.7% ICU Level of Service D
Analysis Period (min) 15

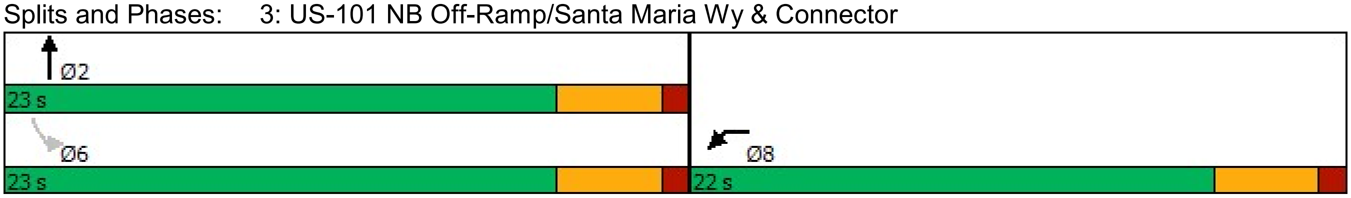
Splits and Phases: 2: Santa Maria Wy & US-101 SB Off-Ramp



Lane Group	WBL	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	154	383	227	0
Future Volume (vph)	154	383	227	0
Turn Type	Prot	NA	Perm	
Protected Phases	8	2		
Permitted Phases			6	
Detector Phase	8	2	6	
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	
Minimum Split (s)	22.5	22.5	22.5	
Total Split (s)	22.0	23.0	23.0	
Total Split (%)	48.9%	51.1%	51.1%	
Yellow Time (s)	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	Min	Min	
Act Effct Green (s)	10.2	21.2	21.2	0.0
Actuated g/C Ratio	0.25	0.52	0.52	0.00
v/c Ratio	0.60	0.52	0.61	2.53
Control Delay	12.8	9.5	19.4	0.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	12.8	9.5	19.4	0.0
LOS	B	A	B	A
Approach Delay	12.8	9.5		7.8
Approach LOS	B	A		A

Intersection Summary	
Cycle Length: 45	
Actuated Cycle Length: 40.4	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 2.53	
Intersection Signal Delay: 9.5	Intersection LOS: A
Intersection Capacity Utilization Err%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 3: US-101 NB Off-Ramp/Santa Maria Wy & Connector



Intersection	
Int Delay, s/veh	8.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	306	281	5	3	2
Future Vol, veh/h	2	306	281	5	3	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	333	305	5	3	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	619	4	5	0	-	0
Stage 1	4	-	-	-	-	-
Stage 2	615	-	-	-	-	-
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	452	1080	1616	-	-	-
Stage 1	1019	-	-	-	-	-
Stage 2	539	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	367	1080	1616	-	-	-
Mov Cap-2 Maneuver	367	-	-	-	-	-
Stage 1	826	-	-	-	-	-
Stage 2	539	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.9	7.6	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1616	-	1067	-	-
HCM Lane V/C Ratio	0.189	-	0.314	-	-
HCM Control Delay (s)	7.7	0	9.9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.7	-	1.4	-	-

Intersection	
Int Delay, s/veh	3.9

Movement	WBL	WBR	SEL	SET	NWT	NWR
Lane Configurations						
Traffic Vol, veh/h	0	2	2	3	1	0
Future Vol, veh/h	0	2	2	3	1	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	0	2	2	3	1	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	8	1	1	0	-	0
Stage 1	1	-	-	-	-	-
Stage 2	7	-	-	-	-	-
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	1013	1084	1622	-	-	-
Stage 1	1022	-	-	-	-	-
Stage 2	1016	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	1012	1084	1622	-	-	-
Mov Cap-2 Maneuver	1012	-	-	-	-	-
Stage 1	1021	-	-	-	-	-
Stage 2	1016	-	-	-	-	-

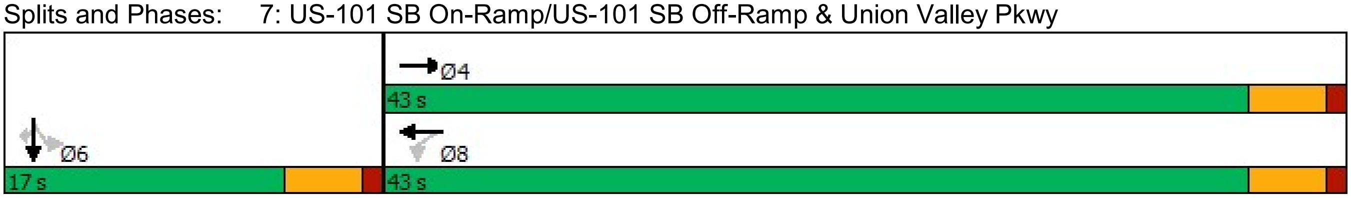
Approach	WB	SE	NW
HCM Control Delay, s	8.3	2.9	0
HCM LOS	A		

Minor Lane/Major Mvmt	NWT	NWR	WBLn1	SEL	SET
Capacity (veh/h)	-	-	1084	1622	-
HCM Lane V/C Ratio	-	-	0.002	0.001	-
HCM Control Delay (s)	-	-	8.3	7.2	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Lane Group	EBT	WBL	WBT	SBT	SBR
Lane Configurations					
Traffic Volume (vph)	1039	2	100	4	727
Future Volume (vph)	1039	2	100	4	727
Turn Type	NA	Perm	NA	NA	Perm
Protected Phases	4		8	6	
Permitted Phases		8			6
Detector Phase	4	8	8	6	6
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5
Total Split (s)	43.0	43.0	43.0	17.0	17.0
Total Split (%)	71.7%	71.7%	71.7%	28.3%	28.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	None	Min	Min
Act Effct Green (s)	38.6	38.6	38.6	8.8	8.8
Actuated g/C Ratio	0.68	0.68	0.68	0.16	0.16
v/c Ratio	1.00	0.02	0.09	0.70	0.70
Control Delay	39.4	4.0	3.8	10.5	10.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	39.4	4.0	3.8	10.5	10.0
LOS	D	A	A	B	B
Approach Delay	39.4		3.8	10.3	
Approach LOS	D		A	B	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 56.4	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.00	
Intersection Signal Delay: 26.9	Intersection LOS: C
Intersection Capacity Utilization 85.0%	ICU Level of Service E
Analysis Period (min) 15	

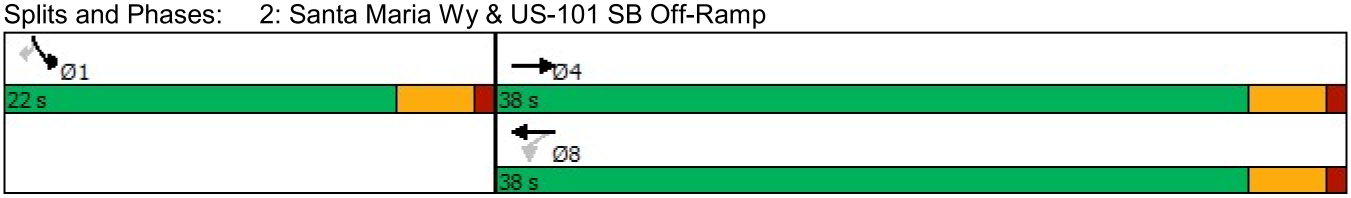
Splits and Phases: 7: US-101 SB On-Ramp/US-101 SB Off-Ramp & Union Valley Pkwy



Lane Group	EBT	WBL	WBT	SBL	SBR
Lane Configurations					
Traffic Volume (vph)	502	48	629	110	538
Future Volume (vph)	502	48	629	110	538
Turn Type	NA	Perm	NA	Prot	Perm
Protected Phases	4		8	1	
Permitted Phases		8			1
Detector Phase	4	8	8	1	1
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	9.5	9.5
Total Split (s)	38.0	38.0	38.0	22.0	22.0
Total Split (%)	63.3%	63.3%	63.3%	36.7%	36.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.5		4.5	4.5	4.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	None	None	None
Act Effct Green (s)	26.3		26.3	17.1	17.1
Actuated g/C Ratio	0.50		0.50	0.33	0.33
v/c Ratio	0.59		0.84	0.21	0.89
Control Delay	12.0		21.6	16.3	31.1
Queue Delay	0.0		0.0	0.0	0.0
Total Delay	12.0		21.6	16.3	31.1
LOS	B		C	B	C
Approach Delay	12.0		21.6		
Approach LOS	B		C		

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 52.6	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 21.4	Intersection LOS: C
Intersection Capacity Utilization 79.1%	ICU Level of Service D
Analysis Period (min) 15	

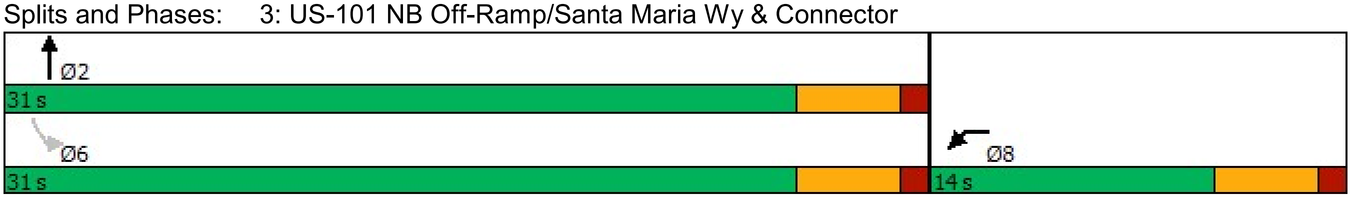
Splits and Phases: 2: Santa Maria Wy & US-101 SB Off-Ramp



Lane Group	WBL	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	204	587	174	0
Future Volume (vph)	204	587	174	0
Turn Type	Prot	NA	Perm	
Protected Phases	8	2		
Permitted Phases			6	
Detector Phase	8	2	6	
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	
Minimum Split (s)	22.5	22.5	22.5	
Total Split (s)	14.0	31.0	31.0	
Total Split (%)	31.1%	68.9%	68.9%	
Yellow Time (s)	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	Min	Min	
Act Effct Green (s)	9.6	21.0	21.0	0.0
Actuated g/C Ratio	0.24	0.53	0.53	0.00
v/c Ratio	0.79	0.73	0.77	2.85
Control Delay	30.6	11.8	32.6	0.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	30.6	11.8	32.6	0.0
LOS	C	B	C	A
Approach Delay	30.6	11.8		10.2
Approach LOS	C	B		B

Intersection Summary	
Cycle Length: 45	
Actuated Cycle Length: 39.7	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 2.85	
Intersection Signal Delay: 15.3	Intersection LOS: B
Intersection Capacity Utilization Err%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 3: US-101 NB Off-Ramp/Santa Maria Wy & Connector



Intersection						
Int Delay, s/veh	8.4					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	238	319	0	0	17
Future Vol, veh/h	4	238	319	0	0	17
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	4	259	347	0	0	18

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	703	9	18	0	-	0
Stage 1	9	-	-	-	-	-
Stage 2	694	-	-	-	-	-
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	404	1073	1599	-	-	-
Stage 1	1014	-	-	-	-	-
Stage 2	496	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	316	1073	1599	-	-	-
Mov Cap-2 Maneuver	316	-	-	-	-	-
Stage 1	794	-	-	-	-	-
Stage 2	496	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.7	7.9	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1599	-	1032	-	-
HCM Lane V/C Ratio	0.217	-	0.255	-	-
HCM Control Delay (s)	7.9	0	9.7	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.8	-	1	-	-

Intersection						
Int Delay, s/veh	3.7					

Movement	WBL	WBR	SEL	SET	NWT	NWR
Lane Configurations						
Traffic Vol, veh/h	0	4	1	0	6	0
Future Vol, veh/h	0	4	1	0	6	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	0	4	1	0	7	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	9	7	7	0	-	0
Stage 1	7	-	-	-	-	-
Stage 2	2	-	-	-	-	-
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	1011	1075	1614	-	-	-
Stage 1	1016	-	-	-	-	-
Stage 2	1021	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	1010	1075	1614	-	-	-
Mov Cap-2 Maneuver	1010	-	-	-	-	-
Stage 1	1015	-	-	-	-	-
Stage 2	1021	-	-	-	-	-

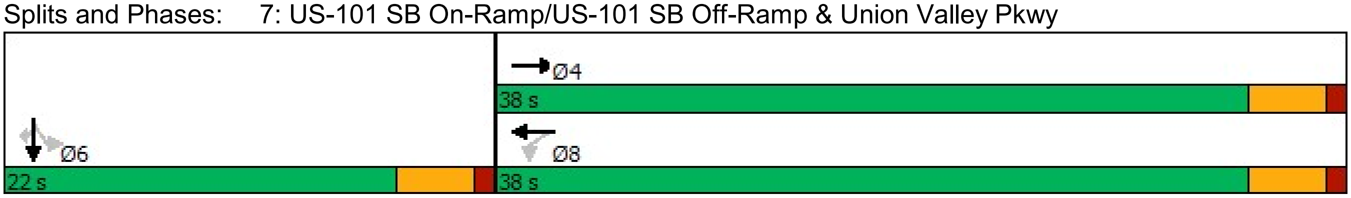
Approach	WB	SE	NW
HCM Control Delay, s	8.4	7.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NWT	NWR	WBLn1	SEL	SET
Capacity (veh/h)	-	-	1075	1614	-
HCM Lane V/C Ratio	-	-	0.004	0.001	-
HCM Control Delay (s)	-	-	8.4	7.2	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Lane Group	EBT	WBL	WBT	SBT	SBR
Lane Configurations					
Traffic Volume (vph)	810	3	127	2	919
Future Volume (vph)	810	3	127	2	919
Turn Type	NA	Perm	NA	NA	Perm
Protected Phases	4		8	6	
Permitted Phases		8			6
Detector Phase	4	8	8	6	6
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5
Total Split (s)	38.0	38.0	38.0	22.0	22.0
Total Split (%)	63.3%	63.3%	63.3%	36.7%	36.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	None	Min	Min
Act Effct Green (s)	29.9	29.9	29.9	10.7	10.7
Actuated g/C Ratio	0.60	0.60	0.60	0.21	0.21
v/c Ratio	0.86	0.02	0.12	0.70	0.70
Control Delay	20.0	6.0	5.5	8.3	8.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	20.0	6.0	5.5	8.3	8.1
LOS	B	A	A	A	A
Approach Delay	20.0		5.5	8.2	
Approach LOS	B		A	A	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 49.9	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.86	
Intersection Signal Delay: 13.3	Intersection LOS: B
Intersection Capacity Utilization 73.3%	ICU Level of Service D
Analysis Period (min) 15	

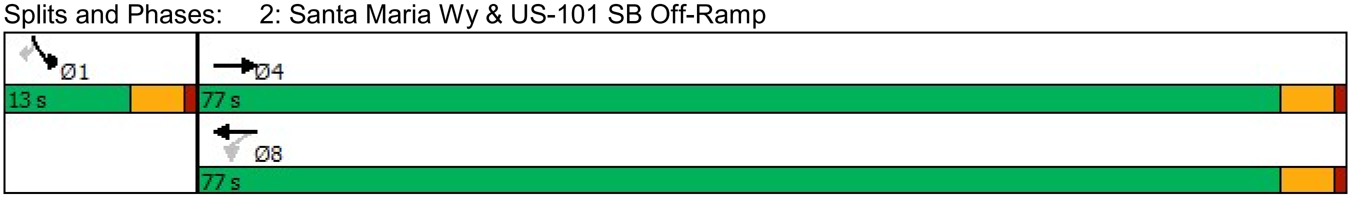
Splits and Phases: 7: US-101 SB On-Ramp/US-101 SB Off-Ramp & Union Valley Pkwy



Lane Group	EBT	WBL	WBT	SBL	SBR
Lane Configurations					
Traffic Volume (vph)	205	341	975	120	175
Future Volume (vph)	205	341	975	120	175
Turn Type	NA	Perm	NA	Prot	Perm
Protected Phases	4		8	1	
Permitted Phases		8			1
Detector Phase	4	8	8	1	1
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	9.5	9.5
Total Split (s)	77.0	77.0	77.0	13.0	13.0
Total Split (%)	85.6%	85.6%	85.6%	14.4%	14.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.5		4.5	4.5	4.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	None	None	None
Act Effct Green (s)	72.5		72.5	8.5	8.5
Actuated g/C Ratio	0.81		0.81	0.09	0.09
v/c Ratio	0.15		1.14	0.78	0.59
Control Delay	2.2		85.1	71.6	14.4
Queue Delay	0.0		0.0	0.0	0.0
Total Delay	2.2		85.1	71.6	14.4
LOS	A		F	E	B
Approach Delay	2.2		85.1		
Approach LOS	A		F		

Intersection Summary	
Cycle Length: 90	
Actuated Cycle Length: 90	
Natural Cycle: 150	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.14	
Intersection Signal Delay: 68.0	Intersection LOS: E
Intersection Capacity Utilization 98.4%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 2: Santa Maria Wy & US-101 SB Off-Ramp



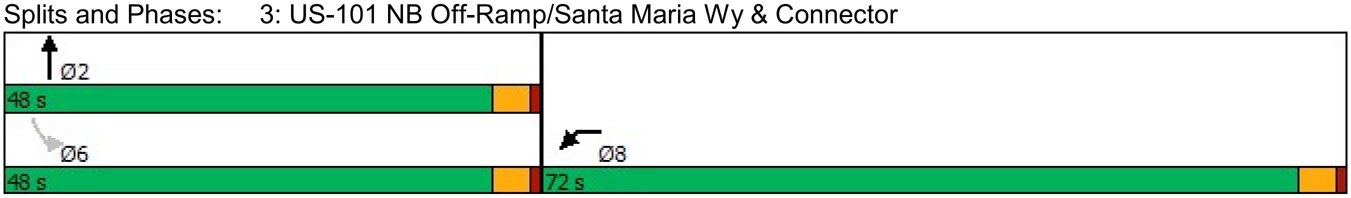
Timings
3: US-101 NB Off-Ramp/Santa Maria Wy & Connector

04/23/2020

Lane Group	WBL	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	94	288	186	0
Future Volume (vph)	94	288	186	0
Turn Type	Prot	NA	Perm	
Protected Phases	8	2		
Permitted Phases			6	
Detector Phase	8	2	6	
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	
Minimum Split (s)	22.5	22.5	22.5	
Total Split (s)	72.0	48.0	48.0	
Total Split (%)	60.0%	40.0%	40.0%	
Yellow Time (s)	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	Min	Min	
Act Effct Green (s)	67.6	40.7	40.7	0.0
Actuated g/C Ratio	0.58	0.35	0.35	0.00
v/c Ratio	1.13	0.61	0.99	2.51
Control Delay	88.6	35.3	100.3	0.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	88.6	35.3	100.3	0.0
LOS	F	D	F	A
Approach Delay	88.6	35.3		59.6
Approach LOS	F	D		E

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 117.3	
Natural Cycle: 120	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 2.51	
Intersection Signal Delay: 73.0	Intersection LOS: E
Intersection Capacity Utilization Err%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 3: US-101 NB Off-Ramp/Santa Maria Wy & Connector



Intersection						
Int Delay, s/veh	12.9					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	256	1126	0	0	0
Future Vol, veh/h	0	256	1126	0	0	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	0	278	1224	0	0	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2449	1	1	0	-	0
Stage 1	1	-	-	-	-	-
Stage 2	2448	-	-	-	-	-
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	34	1084	1622	-	-	-
Stage 1	1022	-	-	-	-	-
Stage 2	68	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	8	1084	1622	-	-	-
Mov Cap-2 Maneuver	8	-	-	-	-	-
Stage 1	250	-	-	-	-	-
Stage 2	68	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.5	13.7	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1622	-	1084	-	-
HCM Lane V/C Ratio	0.755	-	0.257	-	-
HCM Control Delay (s)	13.7	0	9.5	-	-
HCM Lane LOS	B	A	A	-	-
HCM 95th %tile Q(veh)	8	-	1	-	-

Intersection	
Int Delay, s/veh	32.6

Movement	WBL	WBR	SEL	SET	NWT	NWR
Lane Configurations						
Traffic Vol, veh/h	1	487	47	52	527	0
Future Vol, veh/h	1	487	47	52	527	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	1	529	51	57	573	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	732	573	573	0	-	0
Stage 1	573	-	-	-	-	-
Stage 2	159	-	-	-	-	-
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	388	~ 519	1000	-	-	-
Stage 1	564	-	-	-	-	-
Stage 2	870	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	367	~ 519	1000	-	-	-
Mov Cap-2 Maneuver	367	-	-	-	-	-
Stage 1	534	-	-	-	-	-
Stage 2	870	-	-	-	-	-

Approach	WB	SE	NW
HCM Control Delay, s	73.6	4.2	0
HCM LOS	F		

Minor Lane/Major Mvmt	NWT	NWR	WBLn1	SEL	SET
Capacity (veh/h)	-	-	519	1000	-
HCM Lane V/C Ratio	-	-	1.022	0.051	-
HCM Control Delay (s)	-	-	73.6	8.8	0
HCM Lane LOS	-	-	F	A	A
HCM 95th %tile Q(veh)	-	-	14.8	0.2	-

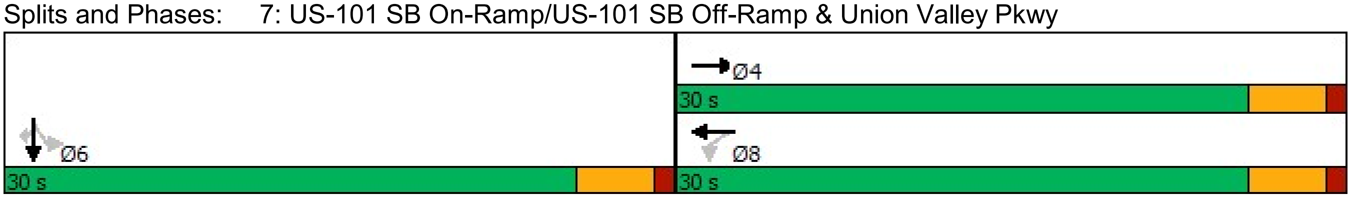
Notes

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

Lane Group	EBT	WBL	WBT	SBT	SBR
Lane Configurations					
Traffic Volume (vph)	268	2	55	3	522
Future Volume (vph)	268	2	55	3	522
Turn Type	NA	Perm	NA	NA	Perm
Protected Phases	4		8	6	
Permitted Phases		8			6
Detector Phase	4	8	8	6	6
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5
Total Split (s)	30.0	30.0	30.0	30.0	30.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	None	Min	Min
Act Effct Green (s)	10.1	10.1	10.1	9.8	9.8
Actuated g/C Ratio	0.34	0.34	0.34	0.33	0.33
v/c Ratio	0.49	0.01	0.09	0.45	0.43
Control Delay	10.3	7.0	7.1	4.5	3.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	10.3	7.0	7.1	4.5	3.6
LOS	B	A	A	A	A
Approach Delay	10.3		7.1	4.1	
Approach LOS	B		A	A	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 29.3	
Natural Cycle: 45	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.49	
Intersection Signal Delay: 6.2	Intersection LOS: A
Intersection Capacity Utilization 35.8%	ICU Level of Service A
Analysis Period (min) 15	

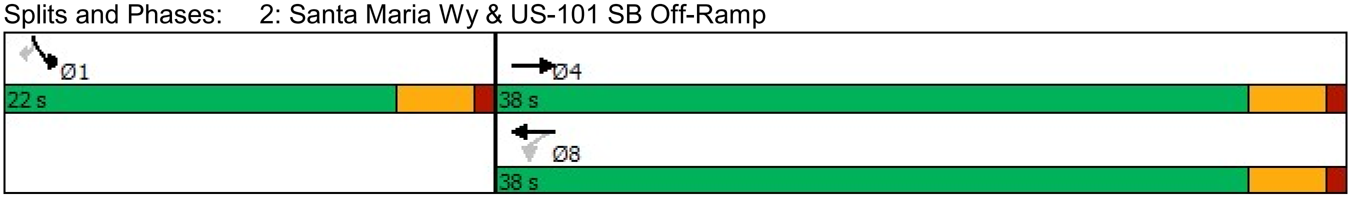
Splits and Phases: 7: US-101 SB On-Ramp/US-101 SB Off-Ramp & Union Valley Pkwy



Lane Group	EBT	WBL	WBT	SBL	SBR
Lane Configurations					
Traffic Volume (vph)	567	29	499	132	517
Future Volume (vph)	567	29	499	132	517
Turn Type	NA	Perm	NA	Prot	Perm
Protected Phases	4		8	1	
Permitted Phases		8			1
Detector Phase	4	8	8	1	1
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	9.5	9.5
Total Split (s)	38.0	38.0	38.0	22.0	22.0
Total Split (%)	63.3%	63.3%	63.3%	36.7%	36.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.5		4.5	4.5	4.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	None	None	None
Act Effct Green (s)	20.0		20.0	13.6	13.6
Actuated g/C Ratio	0.46		0.46	0.31	0.31
v/c Ratio	0.72		0.70	0.26	0.79
Control Delay	14.9		14.7	14.5	17.8
Queue Delay	0.0		0.0	0.0	0.0
Total Delay	14.9		14.7	14.5	17.8
LOS	B		B	B	B
Approach Delay	14.9		14.7		
Approach LOS	B		B		

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 43.3	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.79	
Intersection Signal Delay: 15.7	Intersection LOS: B
Intersection Capacity Utilization 67.4%	ICU Level of Service C
Analysis Period (min) 15	

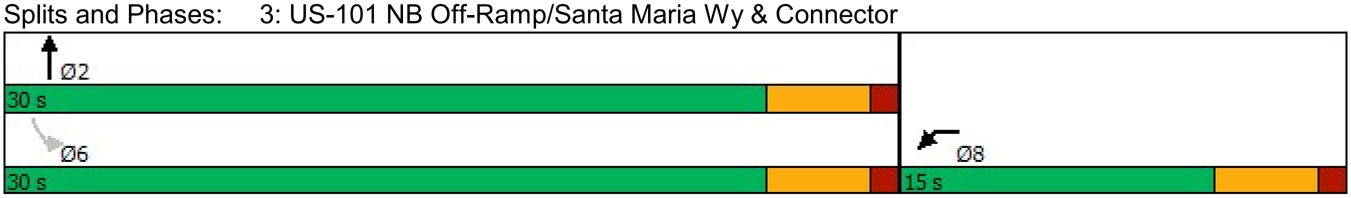
Splits and Phases: 2: Santa Maria Wy & US-101 SB Off-Ramp



Lane Group	WBL	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	154	383	181	0
Future Volume (vph)	154	383	181	0
Turn Type	Prot	NA	Perm	
Protected Phases	8	2		
Permitted Phases			6	
Detector Phase	8	2	6	
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	
Minimum Split (s)	22.5	22.5	22.5	
Total Split (s)	15.0	30.0	30.0	
Total Split (%)	33.3%	66.7%	66.7%	
Yellow Time (s)	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	Min	Min	
Act Effct Green (s)	9.0	16.3	16.3	0.0
Actuated g/C Ratio	0.26	0.47	0.47	0.00
v/c Ratio	0.61	0.54	0.51	2.53
Control Delay	14.4	9.0	12.4	0.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	14.4	9.0	12.4	0.0
LOS	B	A	B	A
Approach Delay	14.4	9.0		4.3
Approach LOS	B	A		A

Intersection Summary	
Cycle Length: 45	
Actuated Cycle Length: 34.5	
Natural Cycle: 55	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 2.53	
Intersection Signal Delay: 8.3	Intersection LOS: A
Intersection Capacity Utilization Err%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 3: US-101 NB Off-Ramp/Santa Maria Wy & Connector



Intersection	
Int Delay, s/veh	8.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	236	281	5	3	2
Future Vol, veh/h	2	236	281	5	3	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	257	305	5	3	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	619	4	5	0	-	0
Stage 1	4	-	-	-	-	-
Stage 2	615	-	-	-	-	-
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	452	1080	1616	-	-	-
Stage 1	1019	-	-	-	-	-
Stage 2	539	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	367	1080	1616	-	-	-
Mov Cap-2 Maneuver	367	-	-	-	-	-
Stage 1	826	-	-	-	-	-
Stage 2	539	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.5	7.6	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1616	-	1063	-	-
HCM Lane V/C Ratio	0.189	-	0.243	-	-
HCM Control Delay (s)	7.7	0	9.5	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.7	-	1	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	SEL	SET	NWT	NWR
Lane Configurations						
Traffic Vol, veh/h	0	2	2	68	71	0
Future Vol, veh/h	0	2	2	68	71	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	0	2	2	74	77	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	155	77	77	0	-	0
Stage 1	77	-	-	-	-	-
Stage 2	78	-	-	-	-	-
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	836	984	1522	-	-	-
Stage 1	946	-	-	-	-	-
Stage 2	945	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	835	984	1522	-	-	-
Mov Cap-2 Maneuver	835	-	-	-	-	-
Stage 1	945	-	-	-	-	-
Stage 2	945	-	-	-	-	-

Approach	WB	SE	NW
HCM Control Delay, s	8.7	0.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NWT	NWR	WBLn1	SEL	SET
Capacity (veh/h)	-	-	984	1522	-
HCM Lane V/C Ratio	-	-	0.002	0.001	-
HCM Control Delay (s)	-	-	8.7	7.4	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR	NWL	NWR
Lane Configurations								
Traffic Vol, veh/h	31	0	14	28	0	0	102	15
Future Vol, veh/h	31	0	14	28	0	0	102	15
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	-	-	None	-	-	-	None
Storage Length	-	-	200	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	16974	-	0	-
Grade, %	0	-	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2
Mvmt Flow	34	0	15	30	0	0	111	16

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1121	0	60	0
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	60	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	623	-	947	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	963	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	623	-	905	-
Mov Cap-2 Maneuver	-	-	-	-	905	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	963	-

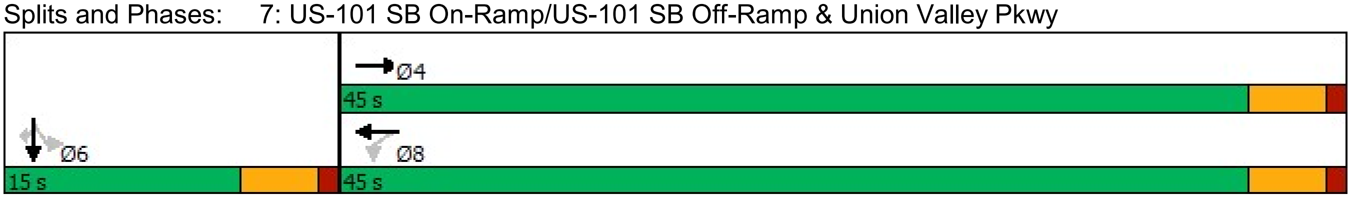
Approach	EB	WB	NW
HCM Control Delay, s	0.2	3.6	
HCM LOS			-

Minor Lane/Major Mvmt	NWLn1	EBT	EBR	EBR2	WBL	WBT
Capacity (veh/h)	-	1583	-	-	623	-
HCM Lane V/C Ratio	-	0.021	-	-	0.024	-
HCM Control Delay (s)	-	7.3	-	-	10.9	-
HCM Lane LOS	-	A	-	-	B	-
HCM 95th %tile Q(veh)	-	0.1	-	-	0.1	-

Lane Group	EBT	WBL	WBT	SBT	SBR
Lane Configurations					
Traffic Volume (vph)	1070	2	128	4	727
Future Volume (vph)	1070	2	128	4	727
Turn Type	NA	Perm	NA	NA	Perm
Protected Phases	4		8	6	
Permitted Phases		8			6
Detector Phase	4	8	8	6	6
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5
Total Split (s)	45.0	45.0	45.0	15.0	15.0
Total Split (%)	75.0%	75.0%	75.0%	25.0%	25.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	None	Min	Min
Act Effct Green (s)	40.5	40.5	40.5	8.1	8.1
Actuated g/C Ratio	0.70	0.70	0.70	0.14	0.14
v/c Ratio	1.00	0.02	0.11	0.73	0.72
Control Delay	37.8	3.5	3.4	11.8	11.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	37.8	3.5	3.4	11.8	11.2
LOS	D	A	A	B	B
Approach Delay	37.8		3.4	11.5	
Approach LOS	D		A	B	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 57.7	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.00	
Intersection Signal Delay: 26.3	Intersection LOS: C
Intersection Capacity Utilization 86.7%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 7: US-101 SB On-Ramp/US-101 SB Off-Ramp & Union Valley Pkwy



Intersection	
Int Delay, s/veh	4.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	46	0	0	0	0	42
Future Vol, veh/h	46	0	0	0	0	42
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	50	0	0	0	0	46

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	23	23	46	0	-	0
Stage 1	23	-	-	-	-	-
Stage 2	0	-	-	-	-	-
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	993	1054	1562	-	-	-
Stage 1	1000	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	993	1054	1562	-	-	-
Mov Cap-2 Maneuver	993	-	-	-	-	-
Stage 1	1000	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.8	0	0
HCM LOS	A		

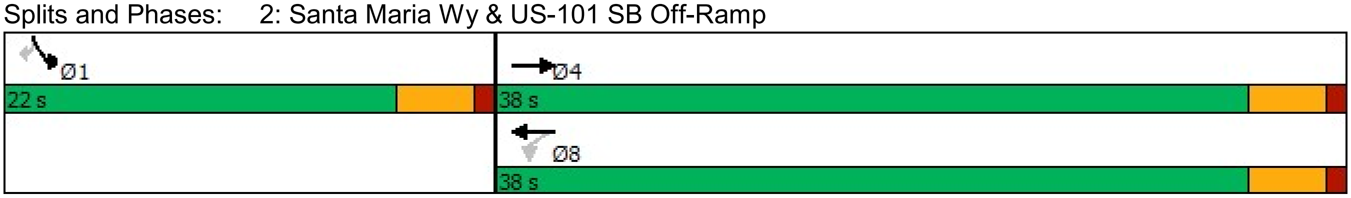
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1562	-	993	-	-
HCM Lane V/C Ratio	-	-	0.05	-	-
HCM Control Delay (s)	0	-	8.8	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.2	-	-

Lane Group	EBT	WBL	WBT	SBL	SBR
Lane Configurations					
Traffic Volume (vph)	466	22	581	110	538
Future Volume (vph)	466	22	581	110	538
Turn Type	NA	Perm	NA	Prot	Perm
Protected Phases	4		8	1	
Permitted Phases		8			1
Detector Phase	4	8	8	1	1
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	9.5	9.5
Total Split (s)	38.0	38.0	38.0	22.0	22.0
Total Split (%)	63.3%	63.3%	63.3%	36.7%	36.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.5		4.5	4.5	4.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	None	None	None
Act Effct Green (s)	22.2		22.2	16.4	16.4
Actuated g/C Ratio	0.46		0.46	0.34	0.34
v/c Ratio	0.59		0.78	0.20	0.83
Control Delay	12.4		18.0	14.6	23.2
Queue Delay	0.0		0.0	0.0	0.0
Total Delay	12.4		18.0	14.6	23.2
LOS	B		B	B	C
Approach Delay	12.4		18.0		
Approach LOS	B		B		

Intersection Summary

Cycle Length: 60
Actuated Cycle Length: 48
Natural Cycle: 55
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 0.83
Intersection Signal Delay: 17.9 Intersection LOS: B
Intersection Capacity Utilization 72.6% ICU Level of Service C
Analysis Period (min) 15

Splits and Phases: 2: Santa Maria Wy & US-101 SB Off-Ramp



Lane Group	WBL	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	204	587	138	0
Future Volume (vph)	204	587	138	0
Turn Type	Prot	NA	Perm	
Protected Phases	8	2		
Permitted Phases			6	
Detector Phase	8	2	6	
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	
Minimum Split (s)	22.5	22.5	22.5	
Total Split (s)	17.0	28.0	28.0	
Total Split (%)	37.8%	62.2%	62.2%	
Yellow Time (s)	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	Min	Min	
Act Effct Green (s)	10.9	20.5	20.5	0.0
Actuated g/C Ratio	0.27	0.51	0.51	0.00
v/c Ratio	0.72	0.75	0.67	2.85
Control Delay	21.2	14.6	28.3	0.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	21.2	14.6	28.3	0.0
LOS	C	B	C	A
Approach Delay	21.2	14.6		7.5
Approach LOS	C	B		A

Intersection Summary	
Cycle Length: 45	
Actuated Cycle Length: 40.5	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 2.85	
Intersection Signal Delay: 13.6	Intersection LOS: B
Intersection Capacity Utilization Err%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 3: US-101 NB Off-Ramp/Santa Maria Wy & Connector

Intersection						
Int Delay, s/veh	8.2					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	183	319	0	0	17
Future Vol, veh/h	4	183	319	0	0	17
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	4	199	347	0	0	18

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	703	9	18	0	-	0
Stage 1	9	-	-	-	-	-
Stage 2	694	-	-	-	-	-
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	404	1073	1599	-	-	-
Stage 1	1014	-	-	-	-	-
Stage 2	496	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	316	1073	1599	-	-	-
Mov Cap-2 Maneuver	316	-	-	-	-	-
Stage 1	794	-	-	-	-	-
Stage 2	496	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.4	7.9	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1599	-	1021	-	-
HCM Lane V/C Ratio	0.217	-	0.199	-	-
HCM Control Delay (s)	7.9	0	9.4	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.8	-	0.7	-	-

Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	SEL	SET	NWT	NWR
Lane Configurations						
Traffic Vol, veh/h	0	4	1	73	61	0
Future Vol, veh/h	0	4	1	73	61	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	0	4	1	79	66	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	147	66	66	0	-	0
Stage 1	66	-	-	-	-	-
Stage 2	81	-	-	-	-	-
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	845	998	1536	-	-	-
Stage 1	957	-	-	-	-	-
Stage 2	942	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	844	998	1536	-	-	-
Mov Cap-2 Maneuver	844	-	-	-	-	-
Stage 1	956	-	-	-	-	-
Stage 2	942	-	-	-	-	-

Approach	WB	SE	NW
HCM Control Delay, s	8.6	0.1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NWT	NWR	WBLn1	SEL	SET
Capacity (veh/h)	-	-	998	1536	-
HCM Lane V/C Ratio	-	-	0.004	0.001	-
HCM Control Delay (s)	-	-	8.6	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR	NWL	NWR
Lane Configurations								
Traffic Vol, veh/h	24	0	16	32	0	0	131	12
Future Vol, veh/h	24	0	16	32	0	0	131	12
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	-	-	None	-	-	-	None
Storage Length	-	-	200	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	16974	-	0	-
Grade, %	0	-	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2
Mvmt Flow	26	0	17	35	0	0	142	13

Major/Minor	Major1		Major2				Minor1	
Conflicting Flow All	0	0	875	0			69	0
Stage 1	-	-	-	-			0	-
Stage 2	-	-	-	-			69	-
Critical Hdwy	-	-	4.12	-			6.42	6.22
Critical Hdwy Stg 1	-	-	-	-			-	-
Critical Hdwy Stg 2	-	-	-	-			5.42	-
Follow-up Hdwy	-	-	2.218	-			3.518	3.318
Pot Cap-1 Maneuver	-	-	771	-			936	-
Stage 1	-	-	-	-			-	-
Stage 2	-	-	-	-			954	-
Platoon blocked, %	-	-		-				
Mov Cap-1 Maneuver	-	-	771	-			900	-
Mov Cap-2 Maneuver	-	-	-	-			900	-
Stage 1	-	-	-	-			-	-
Stage 2	-	-	-	-			954	-

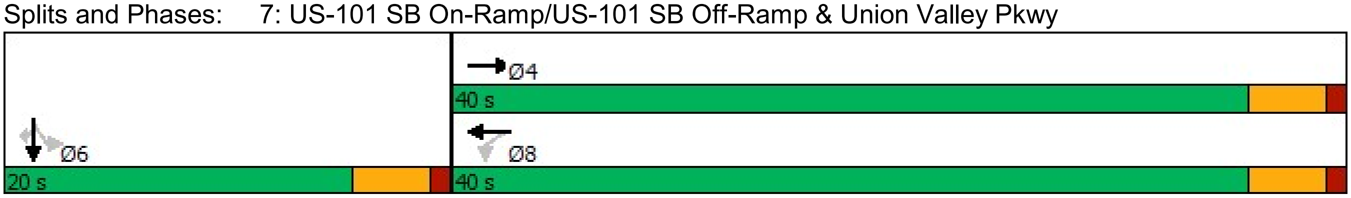
Approach	EB	WB	NW
HCM Control Delay, s	0.2	3.3	
HCM LOS			-

Minor Lane/Major Mvmt	NWLn1	EBT	EBR	EBR2	WBL	WBT
Capacity (veh/h)	-	1576	-	-	771	-
HCM Lane V/C Ratio	-	0.017	-	-	0.023	-
HCM Control Delay (s)	-	7.3	-	-	9.8	-
HCM Lane LOS	-	A	-	-	A	-
HCM 95th %tile Q(veh)	-	0.1	-	-	0.1	-

Lane Group	EBT	WBL	WBT	SBT	SBR
Lane Configurations					
Traffic Volume (vph)	834	3	159	2	919
Future Volume (vph)	834	3	159	2	919
Turn Type	NA	Perm	NA	NA	Perm
Protected Phases	4		8	6	
Permitted Phases		8			6
Detector Phase	4	8	8	6	6
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5
Total Split (s)	40.0	40.0	40.0	20.0	20.0
Total Split (%)	66.7%	66.7%	66.7%	33.3%	33.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	None	Min	Min
Act Effct Green (s)	30.7	30.7	30.7	10.4	10.4
Actuated g/C Ratio	0.61	0.61	0.61	0.21	0.21
v/c Ratio	0.87	0.02	0.15	0.71	0.71
Control Delay	20.0	5.3	5.2	8.8	8.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	20.0	5.3	5.2	8.8	8.5
LOS	C	A	A	A	A
Approach Delay	20.0		5.2	8.6	
Approach LOS	C		A	A	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 50.5	
Natural Cycle: 70	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.87	
Intersection Signal Delay: 13.5	Intersection LOS: B
Intersection Capacity Utilization 74.6%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 7: US-101 SB On-Ramp/US-101 SB Off-Ramp & Union Valley Pkwy



Intersection						
Int Delay, s/veh	3.8					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	36	0	0	0	0	48
Future Vol, veh/h	36	0	0	0	0	48
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	39	0	0	0	0	52

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	26	26	52	0	-	0
Stage 1	26	-	-	-	-	-
Stage 2	0	-	-	-	-	-
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	989	1050	1554	-	-	-
Stage 1	997	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	989	1050	1554	-	-	-
Mov Cap-2 Maneuver	989	-	-	-	-	-
Stage 1	997	-	-	-	-	-
Stage 2	-	-	-	-	-	-

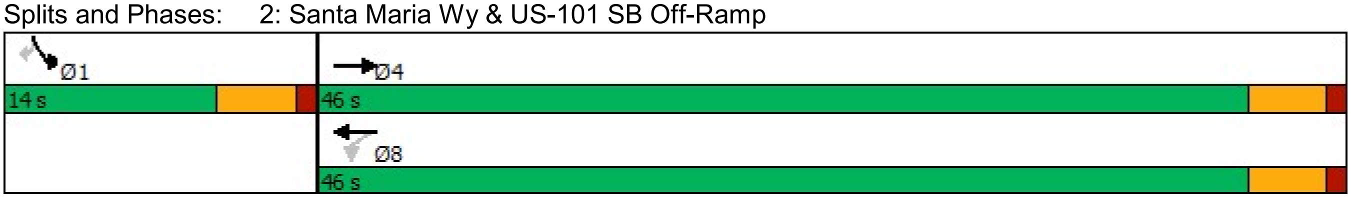
Approach	EB		NB		SB	
HCM Control Delay, s	8.8		0		0	
HCM LOS	A					

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1554	-	989	-	-
HCM Lane V/C Ratio	-	-	0.04	-	-
HCM Control Delay (s)	0	-	8.8	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0	-	0.1	-	-

Lane Group	EBT	WBL	WBT	SBL	SBR
Lane Configurations					
Traffic Volume (vph)	179	48	862	120	175
Future Volume (vph)	179	48	862	120	175
Turn Type	NA	Perm	NA	Prot	Perm
Protected Phases	4		8	1	
Permitted Phases		8			1
Detector Phase	4	8	8	1	1
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	9.5	9.5
Total Split (s)	46.0	46.0	46.0	14.0	14.0
Total Split (%)	76.7%	76.7%	76.7%	23.3%	23.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.5		4.5	4.5	4.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	None	None	None
Act Effct Green (s)	34.5		34.5	8.8	8.8
Actuated g/C Ratio	0.73		0.73	0.19	0.19
v/c Ratio	0.14		0.74	0.40	0.43
Control Delay	3.5		10.8	25.6	8.3
Queue Delay	0.0		0.0	0.0	0.0
Total Delay	3.5		10.8	25.6	8.3
LOS	A		B	C	A
Approach Delay	3.5		10.8		
Approach LOS	A		B		

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 47.3	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.74	
Intersection Signal Delay: 10.8	Intersection LOS: B
Intersection Capacity Utilization 74.9%	ICU Level of Service D
Analysis Period (min) 15	

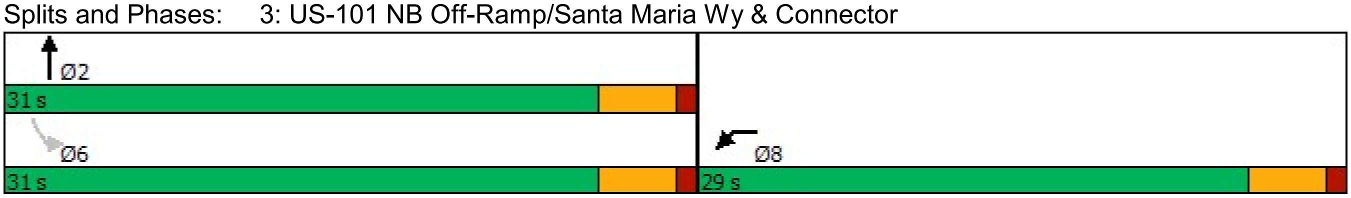
Splits and Phases: 2: Santa Maria Wy & US-101 SB Off-Ramp



Lane Group	WBL	NBT	SBL	SBT
Lane Configurations				
Traffic Volume (vph)	94	288	160	0
Future Volume (vph)	94	288	160	0
Turn Type	Prot	NA	Perm	
Protected Phases	8	2		
Permitted Phases			6	
Detector Phase	8	2	6	
Switch Phase				
Minimum Initial (s)	5.0	5.0	5.0	
Minimum Split (s)	22.5	22.5	22.5	
Total Split (s)	29.0	31.0	31.0	
Total Split (%)	48.3%	51.7%	51.7%	
Yellow Time (s)	3.5	3.5	3.5	
All-Red Time (s)	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	
Total Lost Time (s)	4.5	4.5	4.5	
Lead/Lag				
Lead-Lag Optimize?				
Recall Mode	None	Min	Min	
Act Effct Green (s)	17.5	13.5	13.5	0.0
Actuated g/C Ratio	0.43	0.33	0.33	0.00
v/c Ratio	0.82	0.51	0.54	1.27
Control Delay	14.4	15.2	19.6	0.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	14.4	15.2	19.6	0.0
LOS	B	B	B	A
Approach Delay	14.4	15.2		10.9
Approach LOS	B	B		B

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 40.8	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.27	
Intersection Signal Delay: 13.8	Intersection LOS: B
Intersection Capacity Utilization Err%	ICU Level of Service H
Analysis Period (min) 15	

Splits and Phases: 3: US-101 NB Off-Ramp/Santa Maria Wy & Connector



Intersection						
Int Delay, s/veh	9.2					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	164	721	0	0	0
Future Vol, veh/h	0	164	721	0	0	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	0	178	784	0	0	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	1569	1	1	0	-	0
Stage 1	1	-	-	-	-	-
Stage 2	1568	-	-	-	-	-
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	122	1084	1622	-	-	-
Stage 1	1022	-	-	-	-	-
Stage 2	189	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	63	1084	1622	-	-	-
Mov Cap-2 Maneuver	63	-	-	-	-	-
Stage 1	528	-	-	-	-	-
Stage 2	189	-	-	-	-	-

Approach	EB		NB		SB	
HCM Control Delay, s	9		9.3		0	
HCM LOS	A					

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1622	-	1084	-	-
HCM Lane V/C Ratio	0.483	-	0.164	-	-
HCM Control Delay (s)	9.3	0	9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	2.7	-	0.6	-	-

Intersection	
Int Delay, s/veh	87.4

Movement	WBL	WBR	SEL	SET	NWT	NWR
Lane Configurations						
Traffic Vol, veh/h	406	305	6	1	304	92
Future Vol, veh/h	406	305	6	1	304	92
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	441	332	7	1	330	100

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	395	380	430	0	-	0
Stage 1	380	-	-	-	-	-
Stage 2	15	-	-	-	-	-
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	610	667	1129	-	-	-
Stage 1	691	-	-	-	-	-
Stage 2	1008	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	606	667	1129	-	-	-
Mov Cap-2 Maneuver	606	-	-	-	-	-
Stage 1	687	-	-	-	-	-
Stage 2	1008	-	-	-	-	-

Approach	WB	SE	NW
HCM Control Delay, s	136.8	7	0
HCM LOS	F		

Minor Lane/Major Mvmt	NWT	NWR	WBLn1	SEL	SET
Capacity (veh/h)	-	-	631	1129	-
HCM Lane V/C Ratio	-	-	1.225	0.006	-
HCM Control Delay (s)	-	-	136.8	8.2	0
HCM Lane LOS	-	-	F	A	A
HCM 95th %tile Q(veh)	-	-	28.1	0	-

Intersection	
Int Delay, s/veh	3.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR	NWL	NWR
Lane Configurations								
Traffic Vol, veh/h	40	0	263	151	0	0	50	60
Future Vol, veh/h	40	0	263	151	0	0	50	60
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop	Stop	Stop
RT Channelized	-	-	-	None	-	-	-	None
Storage Length	-	-	200	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	16974	-	0	-
Grade, %	0	-	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2
Mvmt Flow	43	0	286	164	0	0	54	65

Major/Minor	Major1		Major2				Minor1	
Conflicting Flow All	0	0	318	0			736	0
Stage 1	-	-	-	-			0	-
Stage 2	-	-	-	-			736	-
Critical Hdwy	-	-	4.12	-			6.42	6.22
Critical Hdwy Stg 1	-	-	-	-			-	-
Critical Hdwy Stg 2	-	-	-	-			5.42	-
Follow-up Hdwy	-	-	2.218	-			3.518	3.318
Pot Cap-1 Maneuver	-	-	1242	-			386	-
Stage 1	-	-	-	-			-	-
Stage 2	-	-	-	-			474	-
Platoon blocked, %	-	-		-				
Mov Cap-1 Maneuver	-	-	1242	-			288	-
Mov Cap-2 Maneuver	-	-	-	-			288	-
Stage 1	-	-	-	-			-	-
Stage 2	-	-	-	-			474	-

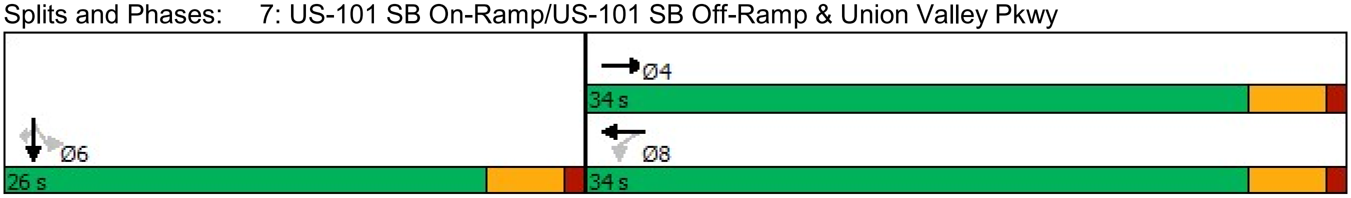
Approach	EB	WB	NW
HCM Control Delay, s	0.9	5.6	
HCM LOS			-

Minor Lane/Major Mvmt	NWLn1	EBT	EBR	EBR2	WBL	WBT
Capacity (veh/h)	-	1414	-	-	1242	-
HCM Lane V/C Ratio	-	0.031	-	-	0.23	-
HCM Control Delay (s)	-	7.6	-	-	8.8	-
HCM Lane LOS	-	A	-	-	A	-
HCM 95th %tile Q(veh)	-	0.1	-	-	0.9	-

Lane Group	EBT	WBL	WBT	SBT	SBR
Lane Configurations					
Traffic Volume (vph)	294	2	201	3	522
Future Volume (vph)	294	2	201	3	522
Turn Type	NA	Perm	NA	NA	Perm
Protected Phases	4		8	6	
Permitted Phases		8			6
Detector Phase	4	8	8	6	6
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5
Total Split (s)	34.0	34.0	34.0	26.0	26.0
Total Split (%)	56.7%	56.7%	56.7%	43.3%	43.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	None	Min	Min
Act Effct Green (s)	10.6	10.6	10.6	8.3	8.3
Actuated g/C Ratio	0.37	0.37	0.37	0.29	0.29
v/c Ratio	0.49	0.01	0.31	0.49	0.46
Control Delay	10.0	6.5	8.3	5.2	4.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	10.0	6.5	8.3	5.2	4.1
LOS	A	A	A	A	A
Approach Delay	10.0		8.2	4.7	
Approach LOS	A		A	A	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 28.4	
Natural Cycle: 45	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.49	
Intersection Signal Delay: 6.9	Intersection LOS: A
Intersection Capacity Utilization 39.6%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 7: US-101 SB On-Ramp/US-101 SB Off-Ramp & Union Valley Pkwy



Intersection						
Int Delay, s/veh	1.9					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	92	0	0	0	0	405
Future Vol, veh/h	92	0	0	0	0	405
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	100	0	0	0	0	440

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	220	220	440	0	-	0
Stage 1	220	-	-	-	-	-
Stage 2	0	-	-	-	-	-
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	768	820	1120	-	-	-
Stage 1	817	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	768	820	1120	-	-	-
Mov Cap-2 Maneuver	768	-	-	-	-	-
Stage 1	817	-	-	-	-	-
Stage 2	-	-	-	-	-	-

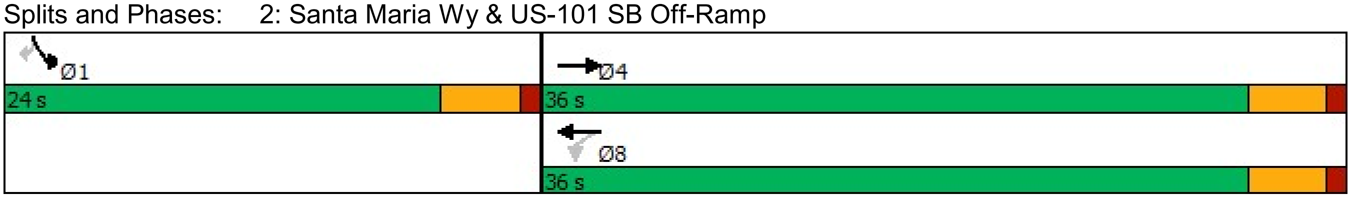
Approach	EB	NB	SB
HCM Control Delay, s	10.4	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1120	-	768	-	-
HCM Lane V/C Ratio	-	-	0.13	-	-
HCM Control Delay (s)	0	-	10.4	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0	-	0.4	-	-

Lane Group	EBT	WBL	WBT	SBL	SBR
Lane Configurations					
Traffic Volume (vph)	613	51	541	132	517
Future Volume (vph)	613	51	541	132	517
Turn Type	NA	Perm	NA	Prot	Perm
Protected Phases	4		8	1	
Permitted Phases		8			1
Detector Phase	4	8	8	1	1
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	9.5	9.5
Total Split (s)	36.0	36.0	36.0	24.0	24.0
Total Split (%)	60.0%	60.0%	60.0%	40.0%	40.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.5		4.5	4.5	4.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	None	None	None
Act Effct Green (s)	25.0		25.0	15.9	15.9
Actuated g/C Ratio	0.50		0.50	0.31	0.31
v/c Ratio	0.72		0.85	0.26	0.84
Control Delay	15.7		24.4	15.8	23.3
Queue Delay	0.0		0.0	0.0	0.0
Total Delay	15.7		24.4	15.8	23.3
LOS	B		C	B	C
Approach Delay	15.7		24.4		
Approach LOS	B		C		

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 50.5	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.85	
Intersection Signal Delay: 20.6	Intersection LOS: C
Intersection Capacity Utilization 81.7%	ICU Level of Service D
Analysis Period (min) 15	

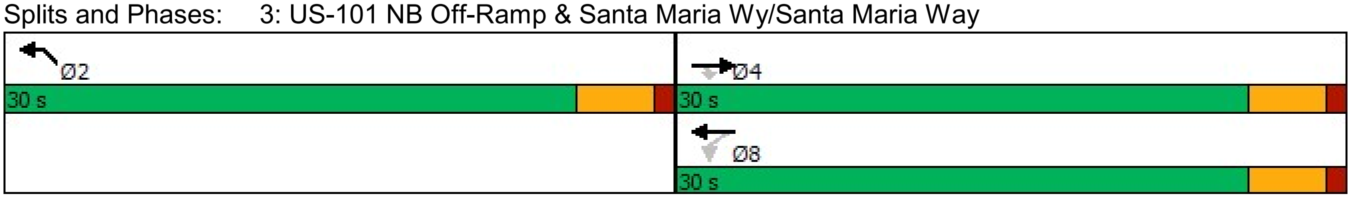
Splits and Phases: 2: Santa Maria Wy & US-101 SB Off-Ramp



Lane Group	EBT	EBR2	WBL	WBT	NWL
Lane Configurations					
Traffic Volume (vph)	227	338	154	131	383
Future Volume (vph)	227	338	154	131	383
Turn Type	NA	Perm	Perm	NA	Prot
Protected Phases	4			8	2
Permitted Phases		4	8		
Detector Phase	4	4	8	8	2
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5
Total Split (s)	30.0	30.0	30.0	30.0	30.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	None	None	Min
Act Effct Green (s)	12.0	12.0	12.0	12.0	15.3
Actuated g/C Ratio	0.32	0.32	0.32	0.32	0.41
v/c Ratio	0.41	0.48	0.46	0.23	0.68
Control Delay	12.9	4.1	15.7	11.3	14.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	12.9	4.1	15.7	11.3	14.1
LOS	B	A	B	B	B
Approach Delay	7.7			13.7	14.1
Approach LOS	A			B	B

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 37.1	
Natural Cycle: 45	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.68	
Intersection Signal Delay: 11.2	Intersection LOS: B
Intersection Capacity Utilization 57.6%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 3: US-101 NB Off-Ramp & Santa Maria Wy/Santa Maria Way



Intersection						
Int Delay, s/veh	8.7					

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	306	281	5	3	2
Future Vol, veh/h	2	306	281	5	3	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	333	305	5	3	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	619	4	5	0	-	0
Stage 1	4	-	-	-	-	-
Stage 2	615	-	-	-	-	-
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	452	1080	1616	-	-	-
Stage 1	1019	-	-	-	-	-
Stage 2	539	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	367	1080	1616	-	-	-
Mov Cap-2 Maneuver	367	-	-	-	-	-
Stage 1	826	-	-	-	-	-
Stage 2	539	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.9	7.6	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1616	-	1067	-	-
HCM Lane V/C Ratio	0.189	-	0.314	-	-
HCM Control Delay (s)	7.7	0	9.9	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.7	-	1.4	-	-

Intersection	
Int Delay, s/veh	3.9

Movement	WBL	WBR	SEL	SET	NWT	NWR
Lane Configurations						
Traffic Vol, veh/h	0	2	2	3	1	0
Future Vol, veh/h	0	2	2	3	1	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	0	2	2	3	1	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	8	1	1	0	-	0
Stage 1	1	-	-	-	-	-
Stage 2	7	-	-	-	-	-
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	1013	1084	1622	-	-	-
Stage 1	1022	-	-	-	-	-
Stage 2	1016	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	1012	1084	1622	-	-	-
Mov Cap-2 Maneuver	1012	-	-	-	-	-
Stage 1	1021	-	-	-	-	-
Stage 2	1016	-	-	-	-	-

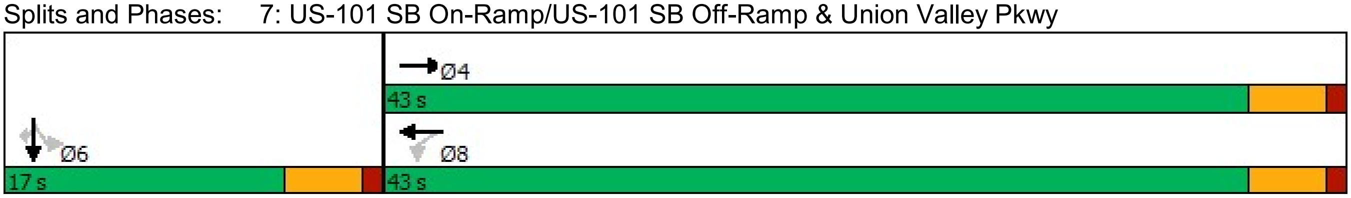
Approach	WB	SE	NW
HCM Control Delay, s	8.3	2.9	0
HCM LOS	A		

Minor Lane/Major Mvmt	NWT	NWR	WBLn1	SEL	SET
Capacity (veh/h)	-	-	1084	1622	-
HCM Lane V/C Ratio	-	-	0.002	0.001	-
HCM Control Delay (s)	-	-	8.3	7.2	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Lane Group	EBT	WBL	WBT	SBT	SBR
Lane Configurations					
Traffic Volume (vph)	1039	2	100	4	727
Future Volume (vph)	1039	2	100	4	727
Turn Type	NA	Perm	NA	NA	Perm
Protected Phases	4		8	6	
Permitted Phases		8			6
Detector Phase	4	8	8	6	6
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5
Total Split (s)	43.0	43.0	43.0	17.0	17.0
Total Split (%)	71.7%	71.7%	71.7%	28.3%	28.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	None	Min	Min
Act Effct Green (s)	38.6	38.6	38.6	8.8	8.8
Actuated g/C Ratio	0.68	0.68	0.68	0.16	0.16
v/c Ratio	1.00	0.02	0.09	0.70	0.70
Control Delay	39.4	4.0	3.8	10.5	10.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	39.4	4.0	3.8	10.5	10.0
LOS	D	A	A	B	B
Approach Delay	39.4		3.8	10.3	
Approach LOS	D		A	B	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 56.4	
Natural Cycle: 90	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 1.00	
Intersection Signal Delay: 26.9	Intersection LOS: C
Intersection Capacity Utilization 85.0%	ICU Level of Service E
Analysis Period (min) 15	

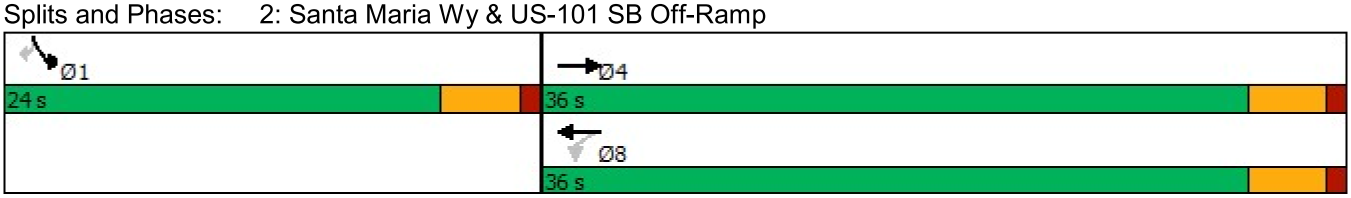
Splits and Phases: 7: US-101 SB On-Ramp/US-101 SB Off-Ramp & Union Valley Pkwy



Lane Group	EBT	WBL	WBT	SBL	SBR
Lane Configurations					
Traffic Volume (vph)	502	48	629	110	538
Future Volume (vph)	502	48	629	110	538
Turn Type	NA	Perm	NA	Prot	Perm
Protected Phases	4		8	1	
Permitted Phases		8			1
Detector Phase	4	8	8	1	1
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	9.5	9.5
Total Split (s)	36.0	36.0	36.0	24.0	24.0
Total Split (%)	60.0%	60.0%	60.0%	40.0%	40.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.5		4.5	4.5	4.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	None	None	None
Act Effct Green (s)	26.5		26.5	18.0	18.0
Actuated g/C Ratio	0.49		0.49	0.33	0.33
v/c Ratio	0.60		0.86	0.20	0.88
Control Delay	13.0		24.2	15.4	30.7
Queue Delay	0.0		0.0	0.0	0.0
Total Delay	13.0		24.2	15.4	30.7
LOS	B		C	B	C
Approach Delay	13.0		24.2		
Approach LOS	B		C		

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 53.8	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.88	
Intersection Signal Delay: 22.5	Intersection LOS: C
Intersection Capacity Utilization 79.1%	ICU Level of Service D
Analysis Period (min) 15	

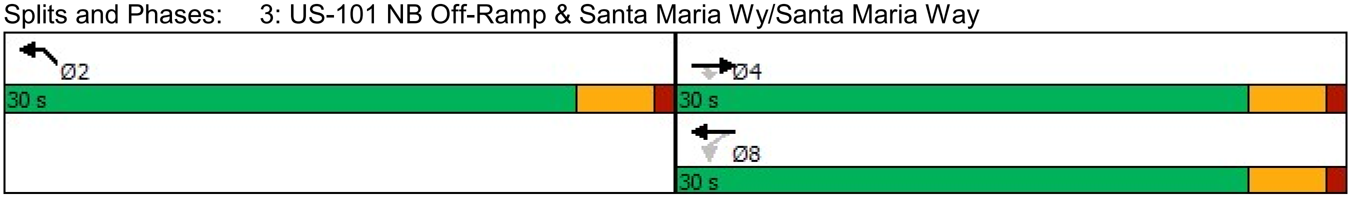
Splits and Phases: 2: Santa Maria Wy & US-101 SB Off-Ramp



Lane Group	EBT	EBR2	WBL	WBT	NWL
Lane Configurations					
Traffic Volume (vph)	174	380	204	133	587
Future Volume (vph)	174	380	204	133	587
Turn Type	NA	Perm	Perm	NA	Prot
Protected Phases	4			8	2
Permitted Phases		4	8		
Detector Phase	4	4	8	8	2
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5
Total Split (s)	30.0	30.0	30.0	30.0	30.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	None	None	Min
Act Effct Green (s)	14.5	14.5	14.5	14.5	23.4
Actuated g/C Ratio	0.31	0.31	0.31	0.31	0.50
v/c Ratio	0.33	0.54	0.61	0.25	0.81
Control Delay	14.3	4.4	21.9	13.5	21.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	14.3	4.4	21.9	13.5	21.2
LOS	B	A	C	B	C
Approach Delay	7.5			18.6	21.2
Approach LOS	A			B	C

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 47.2	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.81	
Intersection Signal Delay: 15.7	Intersection LOS: B
Intersection Capacity Utilization 68.4%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 3: US-101 NB Off-Ramp & Santa Maria Wy/Santa Maria Way



Intersection	
Int Delay, s/veh	8.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	238	319	0	0	17
Future Vol, veh/h	4	238	319	0	0	17
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	4	259	347	0	0	18

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	703	9	18	0	-	0
Stage 1	9	-	-	-	-	-
Stage 2	694	-	-	-	-	-
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	404	1073	1599	-	-	-
Stage 1	1014	-	-	-	-	-
Stage 2	496	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	316	1073	1599	-	-	-
Mov Cap-2 Maneuver	316	-	-	-	-	-
Stage 1	794	-	-	-	-	-
Stage 2	496	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.7	7.9	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1599	-	1032	-	-
HCM Lane V/C Ratio	0.217	-	0.255	-	-
HCM Control Delay (s)	7.9	0	9.7	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0.8	-	1	-	-

Intersection	
Int Delay, s/veh	3.7

Movement	WBL	WBR	SEL	SET	NWT	NWR
Lane Configurations						
Traffic Vol, veh/h	0	4	1	0	6	0
Future Vol, veh/h	0	4	1	0	6	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	0	4	1	0	7	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	9	7	7	0	-	0
Stage 1	7	-	-	-	-	-
Stage 2	2	-	-	-	-	-
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	1011	1075	1614	-	-	-
Stage 1	1016	-	-	-	-	-
Stage 2	1021	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	1010	1075	1614	-	-	-
Mov Cap-2 Maneuver	1010	-	-	-	-	-
Stage 1	1015	-	-	-	-	-
Stage 2	1021	-	-	-	-	-

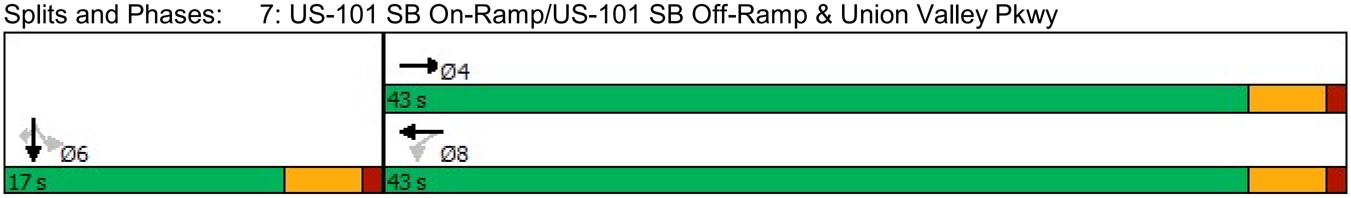
Approach	WB	SE	NW
HCM Control Delay, s	8.4	7.2	0
HCM LOS	A		

Minor Lane/Major Mvmt	NWT	NWR	WBLn1	SEL	SET
Capacity (veh/h)	-	-	1075	1614	-
HCM Lane V/C Ratio	-	-	0.004	0.001	-
HCM Control Delay (s)	-	-	8.4	7.2	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Lane Group	EBT	WBL	WBT	SBT	SBR
Lane Configurations					
Traffic Volume (vph)	810	3	127	2	919
Future Volume (vph)	810	3	127	2	919
Turn Type	NA	Perm	NA	NA	Perm
Protected Phases	4		8	6	
Permitted Phases		8			6
Detector Phase	4	8	8	6	6
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5
Total Split (s)	43.0	43.0	43.0	17.0	17.0
Total Split (%)	71.7%	71.7%	71.7%	28.3%	28.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	None	Min	Min
Act Effct Green (s)	29.3	29.3	29.3	9.6	9.6
Actuated g/C Ratio	0.61	0.61	0.61	0.20	0.20
v/c Ratio	0.85	0.02	0.12	0.72	0.71
Control Delay	16.8	4.3	4.3	9.6	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	16.8	4.3	4.3	9.6	9.3
LOS	B	A	A	A	A
Approach Delay	16.8		4.3	9.5	
Approach LOS	B		A	A	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 48.4	
Natural Cycle: 65	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.85	
Intersection Signal Delay: 12.5	Intersection LOS: B
Intersection Capacity Utilization 73.3%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 7: US-101 SB On-Ramp/US-101 SB Off-Ramp & Union Valley Pkwy

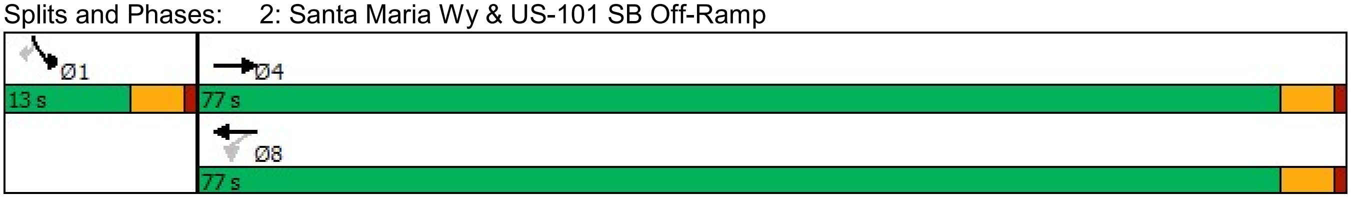


Lane Group	EBT	WBL	WBT	SBL	SBR
Lane Configurations					
Traffic Volume (vph)	205	341	975	120	175
Future Volume (vph)	205	341	975	120	175
Turn Type	NA	Perm	NA	Prot	Perm
Protected Phases	4		8	1	
Permitted Phases		8			1
Detector Phase	4	8	8	1	1
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	9.5	9.5
Total Split (s)	77.0	77.0	77.0	13.0	13.0
Total Split (%)	85.6%	85.6%	85.6%	14.4%	14.4%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0		0.0	0.0	0.0
Total Lost Time (s)	4.5		4.5	4.5	4.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	None	None	None
Act Effct Green (s)	72.5		72.5	8.5	8.5
Actuated g/C Ratio	0.81		0.81	0.09	0.09
v/c Ratio	0.15		1.14	0.78	0.59
Control Delay	2.2		85.1	71.6	14.4
Queue Delay	0.0		0.0	0.0	0.0
Total Delay	2.2		85.1	71.6	14.4
LOS	A		F	E	B
Approach Delay	2.2		85.1		
Approach LOS	A		F		

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Natural Cycle: 150
Control Type: Actuated-Uncoordinated
Maximum v/c Ratio: 1.14
Intersection Signal Delay: 68.0 Intersection LOS: E
Intersection Capacity Utilization 98.4% ICU Level of Service F
Analysis Period (min) 15

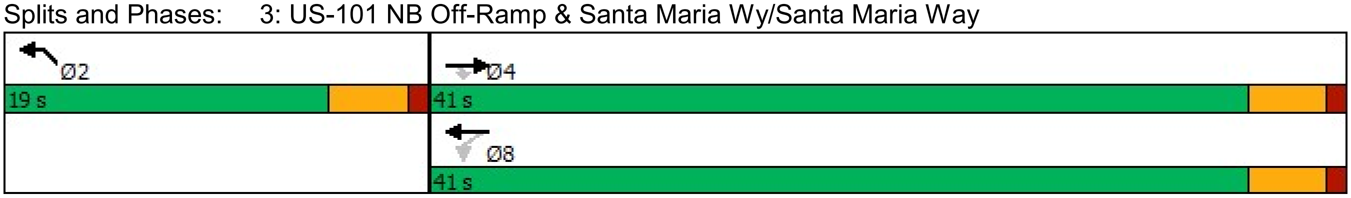
Splits and Phases: 2: Santa Maria Wy & US-101 SB Off-Ramp



Lane Group	EBT	EBR2	WBL	WBT	NWL
Lane Configurations					
Traffic Volume (vph)	186	127	94	1033	288
Future Volume (vph)	186	127	94	1033	288
Turn Type	NA	Perm	Perm	NA	Prot
Protected Phases	4			8	2
Permitted Phases		4	8		
Detector Phase	4	4	8	8	2
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5
Total Split (s)	41.0	41.0	41.0	41.0	19.0
Total Split (%)	68.3%	68.3%	68.3%	68.3%	31.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	None	None	Min
Act Effct Green (s)	36.5	36.5	36.5	36.5	14.1
Actuated g/C Ratio	0.61	0.61	0.61	0.61	0.24
v/c Ratio	0.18	0.14	0.14	0.99	0.89
Control Delay	5.6	1.5	5.7	37.9	47.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	5.6	1.5	5.7	37.9	47.1
LOS	A	A	A	D	D
Approach Delay	3.9			35.2	47.1
Approach LOS	A			D	D

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 59.6	
Natural Cycle: 80	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.99	
Intersection Signal Delay: 32.1	Intersection LOS: C
Intersection Capacity Utilization 82.0%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 3: US-101 NB Off-Ramp & Santa Maria Wy/Santa Maria Way



Intersection	
Int Delay, s/veh	12.9

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	256	1126	0	0	0
Future Vol, veh/h	0	256	1126	0	0	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	0	278	1224	0	0	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	2449	1	1	0	-	0
Stage 1	1	-	-	-	-	-
Stage 2	2448	-	-	-	-	-
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	34	1084	1622	-	-	-
Stage 1	1022	-	-	-	-	-
Stage 2	68	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	8	1084	1622	-	-	-
Mov Cap-2 Maneuver	8	-	-	-	-	-
Stage 1	250	-	-	-	-	-
Stage 2	68	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.5	13.7	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1622	-	1084	-	-
HCM Lane V/C Ratio	0.755	-	0.257	-	-
HCM Control Delay (s)	13.7	0	9.5	-	-
HCM Lane LOS	B	A	A	-	-
HCM 95th %tile Q(veh)	8	-	1	-	-

Intersection	
Int Delay, s/veh	32.6

Movement	WBL	WBR	SEL	SET	NWT	NWR
Lane Configurations						
Traffic Vol, veh/h	1	487	47	52	527	0
Future Vol, veh/h	1	487	47	52	527	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	1	529	51	57	573	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	732	573	573	0	-	0
Stage 1	573	-	-	-	-	-
Stage 2	159	-	-	-	-	-
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	388	~ 519	1000	-	-	-
Stage 1	564	-	-	-	-	-
Stage 2	870	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	367	~ 519	1000	-	-	-
Mov Cap-2 Maneuver	367	-	-	-	-	-
Stage 1	534	-	-	-	-	-
Stage 2	870	-	-	-	-	-

Approach	WB	SE	NW
HCM Control Delay, s	73.6	4.2	0
HCM LOS	F		

Minor Lane/Major Mvmt	NWT	NWR	WBLn1	SEL	SET
Capacity (veh/h)	-	-	519	1000	-
HCM Lane V/C Ratio	-	-	1.022	0.051	-
HCM Control Delay (s)	-	-	73.6	8.8	0
HCM Lane LOS	-	-	F	A	A
HCM 95th %tile Q(veh)	-	-	14.8	0.2	-

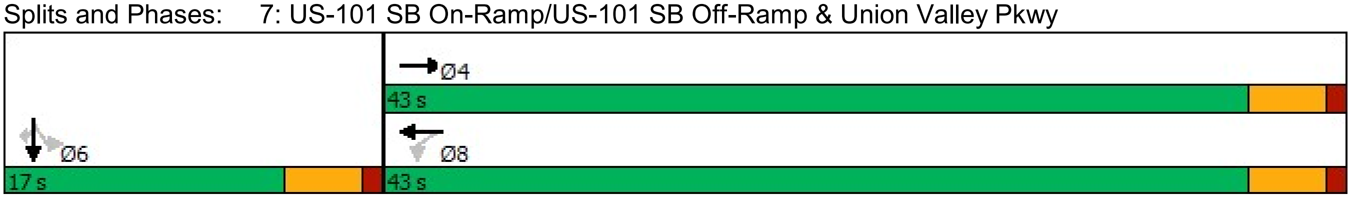
Notes

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

Lane Group	EBT	WBL	WBT	SBT	SBR
Lane Configurations					
Traffic Volume (vph)	268	2	55	3	522
Future Volume (vph)	268	2	55	3	522
Turn Type	NA	Perm	NA	NA	Perm
Protected Phases	4		8	6	
Permitted Phases		8			6
Detector Phase	4	8	8	6	6
Switch Phase					
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	22.5	22.5	22.5	22.5	22.5
Total Split (s)	43.0	43.0	43.0	17.0	17.0
Total Split (%)	71.7%	71.7%	71.7%	28.3%	28.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.5	4.5	4.5	4.5
Lead/Lag					
Lead-Lag Optimize?					
Recall Mode	None	None	None	Min	Min
Act Effct Green (s)	9.9	9.9	9.9	9.4	9.4
Actuated g/C Ratio	0.35	0.35	0.35	0.33	0.33
v/c Ratio	0.48	0.01	0.09	0.46	0.43
Control Delay	9.7	6.5	6.6	4.6	3.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	9.7	6.5	6.6	4.6	3.6
LOS	A	A	A	A	A
Approach Delay	9.7		6.6	4.1	
Approach LOS	A		A	A	

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 28.5	
Natural Cycle: 45	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.48	
Intersection Signal Delay: 6.1	Intersection LOS: A
Intersection Capacity Utilization 35.8%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 7: US-101 SB On-Ramp/US-101 SB Off-Ramp & Union Valley Pkwy



Appendix F – HCS Reports – Mainline (2019)

BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*D. Danehy*
Agency or Company	*Psomas*
Date Performed	*11/21/19*
Analysis Time Period	*Existing AM*

Site Information

Highway/Direction of Travel	*US-101 NB*
From/To	*North of Santa Maria Way*
Jurisdiction	*Caltrans*
Analysis Year	*2019*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*2811*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*62469*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.09*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*2811*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1048*	pc/h/ln
S	*65.0*	mph
D = v_p / S	*16.1*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*D. Danehy*
Agency or Company	*Psomas*
Date Performed	*11/21/19*
Analysis Time Period	*Existing PM*

Site Information

Highway/Direction of Travel	*US-101 NB*
From/To	*North of Santa Maria Way*
Jurisdiction	*Caltrans*
Analysis Year	*2019*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*3436*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*62469*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.11*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*3436*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1281*	pc/h/ln
S	*65.0*	mph
D = v_p / S	*19.7*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 NB*
Agency or Company	*Psomas*	From/To	*North of Santa Maria Way*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*Existing Saturday*	Analysis Year	*2019*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*996*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*49800*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.04*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*996*	veh/h	Grade % Length	*mi*
			Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*371*	pc/h/ln
S	*65.0*	mph
D = v_p / S	*5.7*	pc/mi/ln
LOS	*A*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 SB*
Agency or Company	*Psomas*	From/To	*North of Santa Maria Way*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*Existing AM*	Analysis Year	*2019*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*2811*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*62469*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.09*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*2811*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1572*	pc/h/ln
S	*64.6*	mph
D = v_p / S	*24.3*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 SB*
Agency or Company	*Psomas*	From/To	*North of Santa Maria Way*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*Existing PM*	Analysis Year	*2019*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*3436*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*62469*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.11*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*3436*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	*2*		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	*65.0*	mph	FFS	*65.0*	mph
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures			Design (N)	
Operational (LOS)			Design (N)	
			Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1922*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	*61.1*	mph	S	mph
D = v_p / S	*31.4*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*D*		Required Number of Lanes, N	

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 SB*
Agency or Company	*Psomas*	From/To	*North of Santa Maria Way*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*Existing Saturday*	Analysis Year	*2019*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*996*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*49800*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.04*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*996*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	f_{HV} = $1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	*2*		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	*65.0*	mph	FFS	*65.0*	mph
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures			Design (N)	
Operational (LOS)			Design (N)	
			Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*557*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	*65.0*	mph	S	mph
D = v_p / S	*8.6*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*A*		Required Number of Lanes, N	

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*D. Danehy*
Agency or Company	*Psomas*
Date Performed	*11/21/19*
Analysis Time Period	*Existing AM*

Site Information

Highway/Direction of Travel	*US-101 NB*
From/To	*South of Union Valley Parkway*
Jurisdiction	*Caltrans*
Analysis Year	*2019*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*1804*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*40082*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.09*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*1804*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

<u>Operational (LOS)</u>

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1009*	pc/h/ln
S	*65.0*	mph
D = v_p / S	*15.5*	pc/mi/ln
LOS	*B*	

Design (N)

<u>Design (N)</u>

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 NB*
Agency or Company	*Psomas*	From/To	*South of Union Valley Parkway*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*Existing PM*	Analysis Year	*2019*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*2205*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*40082*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.11*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*2205*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1233*	pc/h/ln
S	*65.0*	mph
D = v_p / S	*19.0*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
S - Speed
V - Hourly volume
D - Density
v_p - Flow rate
FFS - Free-flow speed
LOS - Level of service
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13
f_{LC} - Exhibit 11-9
f_p - Page 11-18
TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*D. Danehy*
Agency or Company	*Psomas*
Date Performed	*11/21/19*
Analysis Time Period	*Existing Saturday*

Site Information

Highway/Direction of Travel	*US-101 NB*
From/To	*South of Union Valley Parkway*
Jurisdiction	*Caltrans*
Analysis Year	*2019*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*902*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*40082*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.05*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*902*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*504*	pc/h/ln
S	*65.0*	mph
D = v_p / S	*7.8*	pc/mi/ln
LOS	*A*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*D. Danehy*
Agency or Company	*Psomas*
Date Performed	*11/21/19*
Analysis Time Period	*Existing AM*

Site Information

Highway/Direction of Travel	*US-101 SB*
From/To	*South of Union Valley Parkway*
Jurisdiction	*Caltrans*
Analysis Year	*2019*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*1804*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*40082*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.09*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*1804*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1009*	pc/h/ln
S	*65.0*	mph
D = v_p / S	*15.5*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

- N - Number of lanes
- V - Hourly volume
- v_p - Flow rate
- LOS - Level of service
- DDHV - Directional design hour volume
- S - Speed
- D - Density
- FFS - Free-flow speed
- BFFS - Base free-flow speed

Factor Location

- E_R - Exhibits 11-10, 11-12
- E_T - Exhibits 11-10, 11-11, 11-13
- f_p - Page 11-18
- LOS, S, FFS, v_p - Exhibits 11-2, 11-3
- f_{LW} - Exhibit 11-8
- f_{LC} - Exhibit 11-9
- TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 SB*
Agency or Company	*Psomas*	From/To	*South of Union Valley Parkway*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*Existing PM*	Analysis Year	*2019*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*2205*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*40082*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.11*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*2205*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	*2*		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	*65.0*	mph	FFS	*65.0*	mph
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures			Design (N)	
Operational (LOS)			Design (N)	
			Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1233*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	*65.0*	mph	S	mph
D = v_p / S	*19.0*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*C*		Required Number of Lanes, N	

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 SB*
Agency or Company	*Psomas*	From/To	*South of Union Valley Parkway*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*Existing Saturday*	Analysis Year	*2019*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*902*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*40082*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.05*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*902*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*504*	pc/h/ln
S	*65.0*	mph
D = v_p / S	*7.8*	pc/mi/ln
LOS	*A*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 NB*
Agency or Company	*Psomas*	From/To	*UVP to Santa Maria Way*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*Existing AM*	Analysis Year	*2019*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*2637*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*55013*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.09*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*51*		General Terrain:	*Level*
DDHV = AADT x K x D	*2637*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	*2*		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	*65.0*	mph	FFS	*65.0*	mph
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures			Design (N)	
Operational (LOS)			Design (N)	
			Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1475*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	*64.9*	mph	S	mph
D = v_p / S	*22.7*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*C*		Required Number of Lanes, N	

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 NB*
Agency or Company	*Psomas*	From/To	*UVP to Santa Maria Way*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*Existing PM*	Analysis Year	*2019*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*3207* veh/h		Peak-Hour Factor, PHF	*0.92*
AADT	*55013* veh/day		%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.11*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*53*		General Terrain:	*Level*
DDHV = AADT x K x D	*3207* veh/h		Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width		ft	f_{LW}		mph
Rt-Side Lat. Clearance		ft	f_{LC}		mph
Number of Lanes, N	*2*		TRD Adjustment		mph
Total Ramp Density, TRD		ramps/mi	FFS	*65.0*	mph
FFS (measured)	*65.0*	mph			
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures			Design (N)	
Operational (LOS)			Design (N)	
			Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1793*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	*62.8*	mph	S	mph
D = v_p / S	*28.5*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*D*		Required Number of Lanes, N	

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*D. Danehy*
Agency or Company	*Psomas*
Date Performed	*11/21/19*
Analysis Time Period	*Existing Saturday*

Site Information

Highway/Direction of Travel	*US-101 NB*
From/To	*UVP to Santa Maria Way*
Jurisdiction	*Caltrans*
Analysis Year	*2019*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*1312*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*55013*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.05*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*53*		General Terrain:	*Level*
DDHV = AADT x K x D	*1312*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*734*	pc/h/ln
S	*65.0*	mph
D = v_p / S	*11.3*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*D. Danehy*
Agency or Company	*Psomas*
Date Performed	*11/21/19*
Analysis Time Period	*Existing AM*

Site Information

Highway/Direction of Travel	*US-101 SB*
From/To	*UVP to Santa Maria Way*
Jurisdiction	*Caltrans*
Analysis Year	*2019*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*2329*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*55013*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.08*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*51*		General Terrain:	*Level*
DDHV = AADT x K x D	*2329*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1302*	pc/h/ln
S	*65.0*	mph
D = v_p / S	*20.0*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*D. Danehy*
Agency or Company	*Psomas*
Date Performed	*11/21/19*
Analysis Time Period	*Existing PM*

Site Information

Highway/Direction of Travel	*US-101 SB*
From/To	*UVP to Santa Maria Way*
Jurisdiction	*Caltrans*
Analysis Year	*2019*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*2828*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*55013*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.10*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*53*		General Terrain:	*Level*
DDHV = AADT x K x D	*2828*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1582*	pc/h/ln
S	*64.5*	mph
D = v_p / S	*24.5*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*D. Danehy*
Agency or Company	*Psomas*
Date Performed	*11/21/19*
Analysis Time Period	*Existing Saturday*

Site Information

Highway/Direction of Travel	*US-101 SB*
From/To	*UVP to Santa Maria Way*
Jurisdiction	*Caltrans*
Analysis Year	*2019*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*1166*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*55013*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.04*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*53*		General Terrain:	*Level*
DDHV = AADT x K x D	*1166*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*652*	pc/h/ln
S	*65.0*	mph
D = v_p / S	*10.0*	pc/mi/ln
LOS	*A*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 NB*
Agency or Company	*Psomas*	From/To	*North of Santa Maria Way*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*Existing + Project AM*	Analysis Year	*2019*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*2802*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*62469*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.09*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*2802*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1045*	pc/h/ln
S	*65.0*	mph
D = v_p / S	*16.1*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*D. Danehy*
Agency or Company	*Psomas*
Date Performed	*11/21/19*
Analysis Time Period	*Existing + Project PM*

Site Information

Highway/Direction of Travel	*US-101 NB*
From/To	*North of Santa Maria Way*
Jurisdiction	*Caltrans*
Analysis Year	*2019*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*3430*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*62469*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.11*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*3430*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	f_{HV} = $1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1279*	pc/h/ln
S	*65.0*	mph
D = v_p / S	*19.7*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*D. Danehy*
Agency or Company	*Psomas*
Date Performed	*11/21/19*
Analysis Time Period	*Existing + Project Saturday*

Site Information

Highway/Direction of Travel	*US-101 NB*
From/To	*North of Santa Maria Way*
Jurisdiction	*Caltrans*
Analysis Year	*2019*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*1192*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*55200*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.04*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*54*		General Terrain:	*Level*
DDHV = AADT x K x D	*1192*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*444*	pc/h/ln
S	*65.0*	mph
D = v_p / S	*6.8*	pc/mi/ln
LOS	*A*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*D. Danehy*
Agency or Company	*Psomas*
Date Performed	*11/21/19*
Analysis Time Period	*Existing + Project AM*

Site Information

Highway/Direction of Travel	*US-101 SB*
From/To	*North of Santa Maria Way*
Jurisdiction	*Caltrans*
Analysis Year	*2019*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*2820*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*62469*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.09*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*2820*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1577*	pc/h/ln
S	*64.6*	mph
D = v_p / S	*24.4*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 SB*
Agency or Company	*Psomas*	From/To	*North of Santa Maria Way*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*Existing + Project PM*	Analysis Year	*2019*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*3448*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*62469*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.11*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*3448*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	*2*		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	*65.0*	mph	FFS	*65.0*	mph
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures			Design (N)	
Operational (LOS)			Design (N)	
			Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1928*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	*61.0*	mph	S	mph
D = v_p / S	*31.6*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*D*		Required Number of Lanes, N	

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 SB*
Agency or Company	*Psomas*	From/To	*North of Santa Maria Way*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*Existing + Project Saturday*	Analysis Year	*2019*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*998*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*49800*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.04*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*998*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*558*	pc/h/ln
S	*65.0*	mph
D = v_p / S	*8.6*	pc/mi/ln
LOS	*A*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information / Site Information

Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 NB*
Agency or Company	*Psomas*	From/To	*South of Union Valley Parkway*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*Existing + Project AM*	Analysis Year	*2019*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*1806*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*40091*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.09*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*1806*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1010*	pc/h/ln
S	*65.0*	mph
D = v_p / S	*15.5*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
S - Speed
V - Hourly volume
D - Density
v_p - Flow rate
FFS - Free-flow speed
LOS - Level of service
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13
f_{LC} - Exhibit 11-9
f_p - Page 11-18
TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		**Site Information**	
Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 NB*
Agency or Company	*Psomas*	From/To	*South of Union Valley Parkway*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*Existing + Project PM*	Analysis Year	*2019*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*2207*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*40091*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.11*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*2207*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width		ft	f_{LW}		mph
Rt-Side Lat. Clearance		ft	f_{LC}		mph
Number of Lanes, N	*2*		TRD Adjustment		mph
Total Ramp Density, TRD		ramps/mi	FFS	*65.0*	mph
FFS (measured)	*65.0*	mph			
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures			**Design (N)**	
Operational (LOS)			Design (N)	
			Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1234*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	*65.0*	mph	S	mph
D = v_p / S	*19.0*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*C*		Required Number of Lanes, N	

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 NB*
Agency or Company	*Psomas*	From/To	*South of Union Valley Parkway*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*Existing + Project Saturday*	Analysis Year	*2019*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*905*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*39700*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.04*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*57*		General Terrain:	*Level*
DDHV = AADT x K x D	*905*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	*2*		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	*65.0*	mph	FFS	*65.0*	mph
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures			Design (N)	
Operational (LOS)			Design (N)	
			Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*506*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	*65.0*	mph	S	mph
D = v_p / S	*7.8*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*A*		Required Number of Lanes, N	

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*D. Danehy*
Agency or Company	*Psomas*
Date Performed	*11/21/19*
Analysis Time Period	*Existing + Project AM*

Site Information

Highway/Direction of Travel	*US-101 SB*
From/To	*South of Union Valley Parkway*
Jurisdiction	*Caltrans*
Analysis Year	*2019*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*1800*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*40091*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.09*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*1800*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1007*	pc/h/ln
S	*65.0*	mph
D = v_p / S	*15.5*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*D. Danehy*
Agency or Company	*Psomas*
Date Performed	*11/21/19*
Analysis Time Period	*Existing + Project PM*

Site Information

Highway/Direction of Travel	*US-101 SB*
From/To	*South of Union Valley Parkway*
Jurisdiction	*Caltrans*
Analysis Year	*2019*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*2195*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*40091*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.11*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*2195*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1228*	pc/h/ln
S	*65.0*	mph
D = v_p / S	*18.9*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 SB*
Agency or Company	*Psomas*	From/To	*South of Union Valley Parkway*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*Existing + Project Saturday*	Analysis Year	*2019*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*675*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*33750*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.04*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*675*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	*2*		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	*65.0*	mph	FFS	*65.0*	mph
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures			Design (N)	
Operational (LOS)			Design (N)	
			Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*377*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	*65.0*	mph	S	mph
D = v_p / S	*5.8*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*A*		Required Number of Lanes, N	

Glossary

N - Number of lanes
S - Speed
V - Hourly volume
D - Density
v_p - Flow rate
FFS - Free-flow speed
LOS - Level of service
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13
f_{LC} - Exhibit 11-9
f_p - Page 11-18
TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 NB*
Agency or Company	*Psomas*	From/To	*UVP to Santa Maria Way*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*Existing + Project AM*	Analysis Year	*2019*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*2623*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*54987*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.09*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*53*		General Terrain:	*Level*
DDHV = AADT x K x D	*2623*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	*2*		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	*65.0*	mph	FFS	*65.0*	mph
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures			Design (N)	
Operational (LOS)			Design (N)	
			Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1467*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	*64.9*	mph	S	mph
D = v_p / S	*22.6*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*C*		Required Number of Lanes, N	

Glossary

N - Number of lines
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*D. Danehy*
Agency or Company	*Psomas*
Date Performed	*11/21/19*
Analysis Time Period	*Existing + Project PM*

Site Information

Highway/Direction of Travel	*US-101 NB*
From/To	*UVP to Santa Maria Way*
Jurisdiction	*Caltrans*
Analysis Year	*2019*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*3206*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*54987*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.11*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*53*		General Terrain:	*Level*
DDHV = AADT x K x D	*3206*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1793*	pc/h/ln
S	*62.8*	mph
D = v_p / S	*28.5*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 NB*
Agency or Company	*Psomas*	From/To	*UVP to Santa Maria Way*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*Existing + Project Saturday*	Analysis Year	*2019*

Site Information

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*1499*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*54987*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.04*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*61*		General Terrain:	*Level*
DDHV = AADT x K x D	*1499*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*838*	pc/h/ln
S	*65.0*	mph
D = v_p / S	*12.9*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 SB*
Agency or Company	*Psomas*	From/To	*UVP to Santa Maria Way*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*Existing + Project AM*	Analysis Year	*2019*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*2326*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*54987*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.08*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*2326*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	*2*		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	*65.0*	mph	FFS	*65.0*	mph
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures			Design (N)	
Operational (LOS)			Design (N)	
			Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1301*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	*65.0*	mph	S	mph
D = v_p / S	*20.0*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*C*		Required Number of Lanes, N	

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		**Site Information**	
Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 SB*
Agency or Company	*Psomas*	From/To	*UVP to Santa Maria Way*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*Existing + Project PM*	Analysis Year	*2019*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*2749*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*54987*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.10*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*2749*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	f_{HV} = $1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	*2*		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	*65.0*	mph	FFS	*65.0*	mph
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures			**Design (N)**	
Operational (LOS)			Design (N)	
			Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1537*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	*64.7*	mph	S	mph
D = v_p / S	*23.7*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*C*		Required Number of Lanes, N	

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*D. Danehy*
Agency or Company	*Psomas*
Date Performed	*11/21/19*
Analysis Time Period	*Existing + Project Saturday*

Site Information

Highway/Direction of Travel	*US-101 SB*
From/To	*UVP to Santa Maria Way*
Jurisdiction	*Caltrans*
Analysis Year	*2019*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*938*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*46900*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.04*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*938*	veh/h	Grade % Length	*mi*
			Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*525*	pc/h/ln
S	*65.0*	mph
D = v_p / S	*8.1*	pc/mi/ln
LOS	*A*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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Appendix G – HCS Reports – Mainline (2025)

BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 NB*
Agency or Company	*Psomas*	From/To	*North of Santa Maria Way*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*2025 No Build AM*	Analysis Year	*2025*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*2864*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*63080*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.09*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*2864*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	*3*		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	*65.0*	mph	FFS	*65.0*	mph
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures			Design (N)		
Operational (LOS)			Design (N)		
			Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1068*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S	*65.0*	mph	S		mph
D = v_p / S	*16.4*	pc/mi/ln	D = v_p / S		pc/mi/ln
LOS	*B*		Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 NB*
Agency or Company	*Psomas*	From/To	*North of Santa Maria Way*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*2025 No Build PM*	Analysis Year	*2025*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*3460*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*63080*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.11*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*3460*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1290*	pc/h/ln
S	*65.0*	mph
D = v_p / S	*19.8*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 NB*
Agency or Company	*Psomas*	From/To	*North of Santa Maria Way*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*2025 No Build Saturday*	Analysis Year	*2025*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*1002*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*50000*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.04*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*1002*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*374*	pc/h/ln
S	*65.0*	mph
D = v_p / S	*5.8*	pc/mi/ln
LOS	*A*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

- N - Number of lanes
- V - Hourly volume
- v_p - Flow rate
- LOS - Level of service
- DDHV - Directional design hour volume
- S - Speed
- D - Density
- FFS - Free-flow speed
- BFFS - Base free-flow speed

Factor Location

- E_R - Exhibits 11-10, 11-12
- E_T - Exhibits 11-10, 11-11, 11-13
- f_p - Page 11-18
- LOS, S, FFS, v_p - Exhibits 11-2, 11-3
- f_{LW} - Exhibit 11-8
- f_{LC} - Exhibit 11-9
- TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 SB*
Agency or Company	*Psomas*	From/To	*North of Santa Maria Way*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*2025 No Build AM*	Analysis Year	*2019*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*2876*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*63080*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.09*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*2876*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1608*	pc/h/ln
S	*64.4*	mph
D = v_p / S	*25.0*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 SB*
Agency or Company	*Psomas*	From/To	*North of Santa Maria Way*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*2025 No Build PM*	Analysis Year	*2025*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*3501*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*63080*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.11*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*3501*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	*2*		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	*65.0*	mph	FFS	*65.0*	mph
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures			Design (N)	
Operational (LOS)			Design (N)	
			Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1958*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	*60.6*	mph	S	mph
D = v_p / S	*32.3*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*D*		Required Number of Lanes, N	

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 SB*
Agency or Company	*Psomas*	From/To	*North of Santa Maria Way*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*2025 No Build Saturday*	Analysis Year	*2025*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*1028*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*51400*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.04*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*1028*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]	*0.972*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	*2*		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	*65.0*	mph	FFS	*65.0*	mph
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures			Design (N)	
Operational (LOS)			Design (N)	
			Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*575*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	*65.0*	mph	S	mph
D = v_p / S	*8.8*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*A*		Required Number of Lanes, N	

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 NB*
Agency or Company	*Psomas*	From/To	*South of Union Valley Parkway*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*2025 No Build AM*	Analysis Year	*2025*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*2033*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*40265*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.10*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*51*		General Terrain:	*Level*
DDHV = AADT x K x D	*2033*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width		ft	f_{LW}		mph
Rt-Side Lat. Clearance		ft	f_{LC}		mph
Number of Lanes, N	*2*		TRD Adjustment		mph
Total Ramp Density, TRD		ramps/mi	FFS	*65.0*	mph
FFS (measured)	*65.0*	mph			
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures			Design (N)		
Operational (LOS)			Design (N)		
			Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1137*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S	*65.0*	mph	S		mph
D = v_p / S	*17.5*	pc/mi/ln	D = v_p / S		pc/mi/ln
LOS	*B*		Required Number of Lanes, N		

Glossary

N - Number of lanes
S - Speed
V - Hourly volume
D - Density
v_p - Flow rate
FFS - Free-flow speed
LOS - Level of service
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13
f_{LC} - Exhibit 11-9
f_p - Page 11-18
TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 NB*
Agency or Company	*Psomas*	From/To	*South of Union Valley Parkway*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*2025 No Build PM*	Analysis Year	*2025*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*2515*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*40265*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.12*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*2515*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs / Calc Speed Adj and FFS

Speed Inputs			Calc Speed Adj and FFS		
Lane Width		ft	f_{LW}		mph
Rt-Side Lat. Clearance		ft	f_{LC}		mph
Number of Lanes, N	*2*		TRD Adjustment		mph
Total Ramp Density, TRD		ramps/mi	FFS	*65.0*	mph
FFS (measured)	*65.0*	mph			
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures / Design (N)

LOS and Performance Measures			Design (N)	
Operational (LOS)			Design (N)	
			Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1406*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	*65.0*	mph	S	mph
D = v_p / S	*21.6*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*C*		Required Number of Lanes, N	

Glossary

- N - Number of lanes
- S - Speed
- V - Hourly volume
- D - Density
- v_p - Flow rate
- FFS - Free-flow speed
- LOS - Level of service
- BFFS - Base free-flow speed
- DDHV - Directional design hour volume

Factor Location

- E_R - Exhibits 11-10, 11-12
- f_{LW} - Exhibit 11-8
- E_T - Exhibits 11-10, 11-11, 11-13
- f_{LC} - Exhibit 11-9
- f_p - Page 11-18
- TRD - Page 11-11
- LOS, S, FFS, v_p - Exhibits 11-2, 11-3

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 NB*
Agency or Company	*Psomas*	From/To	*South of Union Valley Parkway*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*2025 No Build Saturday*	Analysis Year	*2025*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*1095*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*40265*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.05*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*1095*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	*2*		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	*65.0*	mph	FFS	*65.0*	mph
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures			Design (N)		
Operational (LOS)			Design (N)		
			Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*612*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S	*65.0*	mph	S		mph
D = v_p / S	*9.4*	pc/mi/ln	D = v_p / S		pc/mi/ln
LOS	*A*		Required Number of Lanes, N		

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 SB*
Agency or Company	*Psomas*	From/To	*South of Union Valley Parkway*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*2025 No Build AM*	Analysis Year	*2025*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*1947*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*40265*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.09*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*51*		General Terrain:	*Level*
DDHV = AADT x K x D	*1947*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1089*	pc/h/ln
S	*65.0*	mph
D = v_p / S	*16.8*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
S - Speed
V - Hourly volume
D - Density
v_p - Flow rate
FFS - Free-flow speed
LOS - Level of service
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13
f_{LC} - Exhibit 11-9
f_p - Page 11-18
TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 SB*
Agency or Company	*Psomas*	From/To	*South of Union Valley Parkway*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*2025 No Build PM*	Analysis Year	*2025*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*2545*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*40265*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.13*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*2545*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width		ft	f_{LW}		mph
Rt-Side Lat. Clearance		ft	f_{LC}		mph
Number of Lanes, N	*2*		TRD Adjustment		mph
Total Ramp Density, TRD		ramps/mi	FFS	*65.0*	mph
FFS (measured)	*65.0*	mph			
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures			Design (N)	
Operational (LOS)			Design (N)	
			Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1423*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	*65.0*	mph	S	mph
D = v_p / S	*21.9*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*C*		Required Number of Lanes, N	

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*D. Danehy*
Agency or Company	*Psomas*
Date Performed	*11/21/19*
Analysis Time Period	*2025 No Build Saturday*

Site Information

Highway/Direction of Travel	*US-101 SB*
From/To	*South of Union Valley Parkway*
Jurisdiction	*Caltrans*
Analysis Year	*2025*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*1083*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*40265*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.05*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*1083*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	f_{HV} = $1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*606*	pc/h/ln
S	*65.0*	mph
D = v_p / S	*9.3*	pc/mi/ln
LOS	*A*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*D. Danehy*
Agency or Company	*Psomas*
Date Performed	*11/21/19*
Analysis Time Period	*2025 No Build AM*

Site Information

Highway/Direction of Travel	*US-101 NB*
From/To	*UVP to Santa Maria Way*
Jurisdiction	*Caltrans*
Analysis Year	*2025*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*2883*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*57913*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.09*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*54*		General Terrain:	*Level*
DDHV = AADT x K x D	*2883*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1612*	pc/h/ln
S	*64.4*	mph
D = v_p / S	*25.0*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 NB*
Agency or Company	*Psomas*	From/To	*UVP to Santa Maria Way*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*2025 No Build PM*	Analysis Year	*2025*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*3526*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*57913*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.12*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*52*		General Terrain:	*Level*
DDHV = AADT x K x D	*3526*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	*2*		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	*65.0*	mph	FFS	*65.0*	mph
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures			Design (N)	
Operational (LOS)			Design (N)	
			Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1972*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	*60.4*	mph	S	mph
D = v_p / S	*32.7*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*D*		Required Number of Lanes, N	

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*D. Danehy*
Agency or Company	*Psomas*
Date Performed	*11/21/19*
Analysis Time Period	*2025 No Build Saturday*

Site Information

Highway/Direction of Travel	*US-101 NB*
From/To	*UVP to Santa Maria Way*
Jurisdiction	*Caltrans*
Analysis Year	*2025*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*1506*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*57913*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.05*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*52*		General Terrain:	*Level*
DDHV = AADT x K x D	*1506*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*842*	pc/h/ln
S	*65.0*	mph
D = v_p / S	*13.0*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 SB*
Agency or Company	*Psomas*	From/To	*UVP to Santa Maria Way*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*2025 No Build AM*	Analysis Year	*2025*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*2473*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*57913*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.09*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*2473*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	f_{HV} = $1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

<u>Operational (LOS)</u>

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1383*	pc/h/ln
S	*65.0*	mph
D = v_p / S	*21.3*	pc/mi/ln
LOS	*C*	

Design (N)

<u>Design (N)</u>

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*D. Danehy*
Agency or Company	*Psomas*
Date Performed	*11/21/19*
Analysis Time Period	*2025 No Build PM*

Site Information

Highway/Direction of Travel	*US-101 SB*
From/To	*UVP to Santa Maria Way*
Jurisdiction	*Caltrans*
Analysis Year	*2025*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*3214*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*57913*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.11*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*3214*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1797*	pc/h/ln
S	*62.8*	mph
D = v_p / S	*28.6*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 SB*
Agency or Company	*Psomas*	From/To	*UVP to Santa Maria Way*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*2025 No Build Saturday*	Analysis Year	*2025*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*1370*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*57913*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.05*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*1370*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*766*	pc/h/ln
S	*65.0*	mph
D = v_p / S	*11.8*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*D. Danehy*
Agency or Company	*Psomas*
Date Performed	*11/21/19*
Analysis Time Period	*2025 with Project AM*

Site Information

Highway/Direction of Travel	*US-101 NB*
From/To	*North of Santa Maria Way*
Jurisdiction	*Caltrans*
Analysis Year	*2025*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*2867*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*63080*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.09*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*2867*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1069*	pc/h/ln
S	*65.0*	mph
D = v_p / S	*16.4*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 NB*
Agency or Company	*Psomas*	From/To	*North of Santa Maria Way*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*2025 with Project PM*	Analysis Year	*2025*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*3466*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*63080*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.11*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*3466*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	*3*		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	*65.0*	mph	FFS	*65.0*	mph
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures			Design (N)	
Operational (LOS)			Design (N)	
			Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1292*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	*65.0*	mph	S	mph
D = v_p / S	*19.9*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*C*		Required Number of Lanes, N	

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 NB*
Agency or Company	*Psomas*	From/To	*North of Santa Maria Way*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*2025 with Project Saturday*	Analysis Year	*2025*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*1208*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*50000*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.05*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*1208*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*450*	pc/h/ln
S	*65.0*	mph
D = v_p / S	*6.9*	pc/mi/ln
LOS	*A*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 SB*
Agency or Company	*Psomas*	From/To	*North of Santa Maria Way*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*2025 with Project AM*	Analysis Year	*2025*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*2876*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*63080*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.09*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*2876*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1608*	pc/h/ln
S	*64.4*	mph
D = v_p / S	*25.0*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 SB*
Agency or Company	*Psomas*	From/To	*North of Santa Maria Way*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*2025 with Project PM*	Analysis Year	*2025*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*3501*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*63080*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.11*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*3501*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1958*	pc/h/ln
S	*60.6*	mph
D = v_p / S	*32.3*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
speed
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*D. Danehy*
Agency or Company	*Psomas*
Date Performed	*11/21/19*
Analysis Time Period	*2025 with Project Saturday*

Site Information

Highway/Direction of Travel	*US-101 SB*
From/To	*North of Santa Maria Way*
Jurisdiction	*Caltrans*
Analysis Year	*2025*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*1028*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*51400*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.04*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*1028*	veh/h	Grade % Length	*mi*
			Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	f_{HV} = $1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*575*	pc/h/ln
S	*65.0*	mph
D = v_p / S	*8.8*	pc/mi/ln
LOS	*A*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 NB*
Agency or Company	*Psomas*	From/To	*South of Union Valley Parkway*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*2025 with Project AM*	Analysis Year	*2025*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*2033*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*40297*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.10*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*51*		General Terrain:	*Level*
DDHV = AADT x K x D	*2033*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	*2*		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	*65.0*	mph	FFS	*65.0*	mph
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures			Design (N)	
Operational (LOS)			Design (N)	
			Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1137*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	*65.0*	mph	S	mph
D = v_p / S	*17.5*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*B*		Required Number of Lanes, N	

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 NB*
Agency or Company	*Psomas*	From/To	*South of Union Valley Parkway*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*2025 with Project PM*	Analysis Year	*2025*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*2515*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*40297*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.12*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*2515*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width		ft	f_{LW}		mph
Rt-Side Lat. Clearance		ft	f_{LC}		mph
Number of Lanes, N	*2*		TRD Adjustment		mph
Total Ramp Density, TRD		ramps/mi	FFS	*65.0*	mph
FFS (measured)	*65.0*	mph			
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures			Design (N)	
Operational (LOS)			Design (N)	
			Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1406*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	*65.0*	mph	S	mph
D = v_p / S	*21.6*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*C*		Required Number of Lanes, N	

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*D. Danehy*
Agency or Company	*Psomas*
Date Performed	*11/21/19*
Analysis Time Period	*2025 with Project Saturday*

Site Information

Highway/Direction of Travel	*US-101 NB*
From/To	*South of Union Valley Parkway*
Jurisdiction	*Caltrans*
Analysis Year	*2025*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*1094*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*40297*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.05*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*56*		General Terrain:	*Level*
DDHV = AADT x K x D	*1094*	veh/h	Grade % Length	*mi*
			Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*612*	pc/h/ln
S	*65.0*	mph
D = v_p / S	*9.4*	pc/mi/ln
LOS	*A*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
S - Speed
V - Hourly volume
D - Density
v_p - Flow rate
FFS - Free-flow speed
LOS - Level of service
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13
f_{LC} - Exhibit 11-9
f_p - Page 11-18
TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 SB*
Agency or Company	*Psomas*	From/To	*South of Union Valley Parkway*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*2025 with Project AM*	Analysis Year	*2025*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*1944*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*40297*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.10*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*1944*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	*2*		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	*65.0*	mph	FFS	*65.0*	mph
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures			Design (N)	
Operational (LOS)			Design (N)	
			Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1087*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	*65.0*	mph	S	mph
D = v_p / S	*16.7*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*B*		Required Number of Lanes, N	

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 SB*
Agency or Company	*Psomas*	From/To	*South of Union Valley Parkway*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*2025 with Project PM*	Analysis Year	*2025*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*2535*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*40297*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.13*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*2535*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1418*	pc/h/ln
S	*65.0*	mph
D = v_p / S	*21.8*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 SB*
Agency or Company	*Psomas*	From/To	*South of Union Valley Parkway*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*2025 with Project Saturday*	Analysis Year	*2025*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*846*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*40297*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.04*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*846*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*473*	pc/h/ln
S	*65.0*	mph
D = v_p / S	*7.3*	pc/mi/ln
LOS	*A*	

Design (N)

Design (N)

Design LOS

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
S - Speed
V - Hourly volume
D - Density
v_p - Flow rate
FFS - Free-flow speed
LOS - Level of service
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13
f_{LC} - Exhibit 11-9
f_p - Page 11-18
TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 NB*
Agency or Company	*Psomas*	From/To	*UVP to Santa Maria Way*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*2025 with Project AM*	Analysis Year	*2025*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*2875*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*57865*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.09*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*54*		General Terrain:	*Level*
DDHV = AADT x K x D	*2875*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1608*	pc/h/ln
S	*64.4*	mph
D = v_p / S	*25.0*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*D. Danehy*
Agency or Company	*Psomas*
Date Performed	*11/21/19*
Analysis Time Period	*2025 with Project PM*

Site Information

Highway/Direction of Travel	*US-101 NB*
From/To	*UVP to Santa Maria Way*
Jurisdiction	*Caltrans*
Analysis Year	*2025*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*3530*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*57865*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.12*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*52*		General Terrain:	*Level*
DDHV = AADT x K x D	*3530*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1974*	pc/h/ln
S	*60.3*	mph
D = v_p / S	*32.7*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		**Site Information**	
Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 NB*
Agency or Company	*Psomas*	From/To	*UVP to Santa Maria Way*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*2025 No Build Saturday*	Analysis Year	*2025*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*1691*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*57865*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.05*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*60*		General Terrain:	*Level*
DDHV = AADT x K x D	*1691*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs			**Calc Speed Adj and FFS**		
Lane Width		ft	f_{LW}		mph
Rt-Side Lat. Clearance		ft	f_{LC}		mph
Number of Lanes, N	*2*		TRD Adjustment		mph
Total Ramp Density, TRD		ramps/mi	FFS	*65.0*	mph
FFS (measured)	*65.0*	mph			
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures			**Design (N)**	
Operational (LOS)			Design (N)	
			Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*946*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	*65.0*	mph	S	mph
D = v_p / S	*14.6*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*B*		Required Number of Lanes, N	

Glossary		**Factor Location**	
N - Number of lanes	S - Speed	E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*D. Danehy*
Agency or Company	*Psomas*
Date Performed	*11/21/19*
Analysis Time Period	*2025 with Project AM*

Site Information

Highway/Direction of Travel	*US-101 SB*
From/To	*UVP to Santa Maria Way*
Jurisdiction	*Caltrans*
Analysis Year	*2025*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*2468*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*57865*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.09*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*2468*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1380*	pc/h/ln
S	*65.0*	mph
D = v_p / S	*21.2*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*D. Danehy*
Agency or Company	*Psomas*
Date Performed	*11/21/19*
Analysis Time Period	*2025 with Project PM*

Site Information

Highway/Direction of Travel	*US-101 SB*
From/To	*UVP to Santa Maria Way*
Jurisdiction	*Caltrans*
Analysis Year	*2025*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*3203*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*57865*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.11*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*3203*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1791*	pc/h/ln
S	*62.8*	mph
D = v_p / S	*28.5*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 SB*
Agency or Company	*Psomas*	From/To	*UVP to Santa Maria Way*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*2025 with Project Saturday*	Analysis Year	*2025*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*1132*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*56600*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.04*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*1132*	veh/h	Grade % Length	*mi*
			Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]	*0.972*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	*2*		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	*65.0*	mph	FFS	*65.0*	mph
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures			Design (N)	
Operational (LOS)			Design (N)	
			Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*633*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	*65.0*	mph	S	mph
D = v_p / S	*9.7*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*A*		Required Number of Lanes, N	

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

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Appendix H – HCS Reports – Mainline (2040)

BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 NB*
Agency or Company	*Psomas*	From/To	*North of Santa Maria Way*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*2040 No Build AM*	Analysis Year	*2040*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*3083*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*69209*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.09*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*3083*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	f_{HV} = $1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	*3*		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	*65.0*	mph	FFS	*65.0*	mph
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures			Design (N)	
Operational (LOS)			Design (N)	
			Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1149*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	*65.0*	mph	S	mph
D = v_p / S	*17.7*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*B*		Required Number of Lanes, N	

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	D. Danehy	Highway/Direction of Travel	US-101 NB
Agency or Company	Psomas	From/To	North of Santa Maria Way
Date Performed	11/21/19	Jurisdiction	Caltrans
Analysis Time Period	2040 No Build PM	Analysis Year	2040

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	3658 veh/h	Peak-Hour Factor, PHF	0.92	
AADT	69209 veh/day	%Trucks and Buses, P_T	5	
Peak-Hr Prop. of AADT, K	0.11	%RVs, P_R	2	
Peak-Hr Direction Prop, D	50	General Terrain:	Level	
DDHV = AADT x K x D	3658 veh/h	Grade % Length Up/Down %	mi	

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.972

Speed Inputs			Calc Speed Adj and FFS		
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	3		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	65.0	mph	FFS	65.0	mph
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures			Design (N)	
Operational (LOS)			Design (N)	
			Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1364	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	65.0	mph	S	mph
D = v_p / S	21.0	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	C		Required Number of Lanes, N	

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 NB*
Agency or Company	*Psomas*	From/To	*North of Santa Maria Way*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*2040 No Build Saturday*	Analysis Year	*2040*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*1124*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*56200*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.04*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*1124*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width		ft	f_{LW}		mph
Rt-Side Lat. Clearance		ft	f_{LC}		mph
Number of Lanes, N	*3*		TRD Adjustment		mph
Total Ramp Density, TRD		ramps/mi	FFS	*65.0*	mph
FFS (measured)	*65.0*	mph			
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures			Design (N)	
Operational (LOS)			Design (N)	
			Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*419*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	*65.0*	mph	S	mph
D = v_p / S	*6.4*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*A*		Required Number of Lanes, N	

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	D. Danehy	Highway/Direction of Travel	US-101 SB
Agency or Company	Psomas	From/To	North of Santa Maria Way
Date Performed	11/21/19	Jurisdiction	Caltrans
Analysis Time Period	2040 No Build AM	Analysis Year	2040

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	3052	veh/h	Peak-Hour Factor, PHF	0.92
AADT	69209	veh/day	%Trucks and Buses, P_T	5
Peak-Hr Prop. of AADT, K	0.09		%RVs, P_R	2
Peak-Hr Direction Prop, D	50		General Terrain:	Level
DDHV = AADT x K x D	3052	veh/h	Grade % Length Up/Down %	mi

Calculate Flow Adjustments

f_p	1.00	E_R	1.2
E_T	1.5	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	0.972

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	2	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	65.0	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	65.0	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	1707	pc/h/ln
S	63.7	mph
D = v_p / S	26.8	pc/mi/ln
LOS	D	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 SB*
Agency or Company	*Psomas*	From/To	*North of Santa Maria Way*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*2040 No Build PM*	Analysis Year	*2040*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*3685*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*69209*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.11*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*3685*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2061*	pc/h/ln
S	*58.8*	mph
D = v_p / S	*35.0*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 SB*
Agency or Company	*Psomas*	From/To	*North of Santa Maria Way*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*2040 No Build Saturday*	Analysis Year	*2040*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*1150*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*57500*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.04*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*1150*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*643*	pc/h/ln
S	*65.0*	mph
D = v_p / S	*9.9*	pc/mi/ln
LOS	*A*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 NB*
Agency or Company	*Psomas*	From/To	*South of Union Valley Parkway*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*2040 No Build AM*	Analysis Year	*2040*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*2240*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*42912*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.10*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*53*		General Terrain:	*Level*
DDHV = AADT x K x D	*2240*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width		ft	f_{LW}		mph
Rt-Side Lat. Clearance		ft	f_{LC}		mph
Number of Lanes, N	*2*		TRD Adjustment		mph
Total Ramp Density, TRD		ramps/mi	FFS	*65.0*	mph
FFS (measured)	*65.0*	mph			
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures			Design (N)	
Operational (LOS)			Design (N)	
			Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1253*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	*65.0*	mph	S	mph
D = v_p / S	*19.3*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*C*		Required Number of Lanes, N	

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*D. Danehy*
Agency or Company	*Psomas*
Date Performed	*11/21/19*
Analysis Time Period	*2040 No Build PM*

Site Information

Highway/Direction of Travel	*US-101 NB*
From/To	*South of Union Valley Parkway*
Jurisdiction	*Caltrans*
Analysis Year	*2040*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*2733*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*42912*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.12*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*51*		General Terrain:	*Level*
DDHV = AADT x K x D	*2733*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1528*	pc/h/ln
S	*64.8*	mph
D = v_p / S	*23.6*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 NB*
Agency or Company	*Psomas*	From/To	*South of Union Valley Parkway*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*2040 No Build Saturday*	Analysis Year	*2040*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*1245*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*42912*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.06*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*52*		General Terrain:	*Level*
DDHV = AADT x K x D	*1245*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width		ft	f_{LW}		mph
Rt-Side Lat. Clearance		ft	f_{LC}		mph
Number of Lanes, N	*2*		TRD Adjustment		mph
Total Ramp Density, TRD		ramps/mi	FFS	*65.0*	mph
FFS (measured)	*65.0*	mph			
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures			Design (N)	
Operational (LOS)			Design (N)	
			Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*696*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	*65.0*	mph	S	mph
D = v_p / S	*10.7*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*A*		Required Number of Lanes, N	

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 SB*
Agency or Company	*Psomas*	From/To	*South of Union Valley Parkway*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*2040 No Build AM*	Analysis Year	*2040*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*2006*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*42912*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.09*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*2006*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	*2*		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	*65.0*	mph	FFS	*65.0*	mph
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures			Design (N)	
Operational (LOS)			Design (N)	
			Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1122*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	*65.0*	mph	S	mph
D = v_p / S	*17.3*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*B*		Required Number of Lanes, N	

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 SB*
Agency or Company	*Psomas*	From/To	*South of Union Valley Parkway*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*2040 No Build PM*	Analysis Year	*2040*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*2609*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*42912*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.12*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*2609*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width		ft	f_{LW}		mph
Rt-Side Lat. Clearance		ft	f_{LC}		mph
Number of Lanes, N	*2*		TRD Adjustment		mph
Total Ramp Density, TRD		ramps/mi	FFS	*65.0*	mph
FFS (measured)	*65.0*	mph			
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures			Design (N)	
Operational (LOS)			Design (N)	
			Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1459*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	*65.0*	mph	S	mph
D = v_p / S	*22.5*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*C*		Required Number of Lanes, N	

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 SB*
Agency or Company	*Psomas*	From/To	*South of Union Valley Parkway*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*2040 No Build Saturday*	Analysis Year	*2040*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*1135*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*42912*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.05*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*1135*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	*2*		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	*65.0*	mph	FFS	*65.0*	mph
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures			Design (N)	
Operational (LOS)			Design (N)	
			Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*635*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	*65.0*	mph	S	mph
D = v_p / S	*9.8*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*A*		Required Number of Lanes, N	

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*D. Danehy*
Agency or Company	*Psomas*
Date Performed	*11/21/19*
Analysis Time Period	*2040 No Build AM*

Site Information

Highway/Direction of Travel	*US-101 NB*
From/To	*UVP to Santa Maria Way*
Jurisdiction	*Caltrans*
Analysis Year	*2040*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*3159*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*61961*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.09*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*55*		General Terrain:	*Level*
DDHV = AADT x K x D	*3159*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1767*	pc/h/ln
S	*63.1*	mph
D = v_p / S	*28.0*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lines
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*D. Danehy*
Agency or Company	*Psomas*
Date Performed	*11/21/19*
Analysis Time Period	*2040 No Build PM*

Site Information

Highway/Direction of Travel	*US-101 NB*
From/To	*UVP to Santa Maria Way*
Jurisdiction	*Caltrans*
Analysis Year	*2040*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*3796*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*61961*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.12*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*53*		General Terrain:	*Level*
DDHV = AADT x K x D	*3796*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2123*	pc/h/ln
S	*57.6*	mph
D = v_p / S	*36.9*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*D. Danehy*
Agency or Company	*Psomas*
Date Performed	*11/21/19*
Analysis Time Period	*2040 No Build Saturday*

Site Information

Highway/Direction of Travel	*US-101 NB*
From/To	*UVP to Santa Maria Way*
Jurisdiction	*Caltrans*
Analysis Year	*2040*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*1681*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*61961*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.05*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*53*		General Terrain:	*Level*
DDHV = AADT x K x D	*1681*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*940*	pc/h/ln
S	*65.0*	mph
D = v_p / S	*14.5*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 SB*
Agency or Company	*Psomas*	From/To	*UVP to Santa Maria Way*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*2040 No Build AM*	Analysis Year	*2040*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*2581*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*61961*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.08*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*2581*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	*2*		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	*65.0*	mph	FFS	*65.0*	mph
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures			Design (N)	
Operational (LOS)			Design (N)	
			Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1443*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	*65.0*	mph	S	mph
D = v_p / S	*22.2*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*C*		Required Number of Lanes, N	

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 SB*
Agency or Company	*Psomas*	From/To	*UVP to Santa Maria Way*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*2040 No Build PM*	Analysis Year	*2040*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*3340*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*61961*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.11*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*3340*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1868*	pc/h/ln
S	*61.9*	mph
D = v_p / S	*30.2*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

- N - Number of lanes
- V - Hourly volume
- v_p - Flow rate
- LOS - Level of service
- DDHV - Directional design hour volume
- S - Speed
- D - Density
- FFS - Free-flow speed
- BFFS - Base free-flow speed

Factor Location

- E_R - Exhibits 11-10, 11-12
- E_T - Exhibits 11-10, 11-11, 11-13
- f_p - Page 11-18
- LOS, S, FFS, v_p - Exhibits 11-2, 11-3
- f_{LW} - Exhibit 11-8
- f_{LC} - Exhibit 11-9
- TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 SB*
Agency or Company	*Psomas*	From/To	*UVP to Santa Maria Way*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*2040 No Build Saturday*	Analysis Year	*2040*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*1465*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*61961*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.05*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*1465*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	f_{HV} = $1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*819*	pc/h/ln
S	*65.0*	mph
D = v_p / S	*12.6*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 NB*
Agency or Company	*Psomas*	From/To	*North of Santa Maria Way*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*2040 with Project AM*	Analysis Year	*2040*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*3090*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*69209*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.09*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*3090*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	*3*		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	*65.0*	mph	FFS	*65.0*	mph
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures			Design (N)		
Operational (LOS)			Design (N)		
			Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1152*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S	*65.0*	mph	S		mph
D = v_p / S	*17.7*	pc/mi/ln	D = v_p / S		pc/mi/ln
LOS	*B*		Required Number of Lanes, N		

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 NB*
Agency or Company	*Psomas*	From/To	*North of Santa Maria Way*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*2040 with Project PM*	Analysis Year	*2040*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*3668*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*69209*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.11*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*3668*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1368*	pc/h/ln
S	*65.0*	mph
D = v_p / S	*21.0*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
S - Speed
V - Hourly volume
D - Density
v_p - Flow rate
FFS - Free-flow speed
LOS - Level of service
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
f_{LW} - Exhibit 11-8
E_T - Exhibits 11-10, 11-11, 11-13
f_{LC} - Exhibit 11-9
f_p - Page 11-18
TRD - Page 11-11
LOS, S, FFS, v_p - Exhibits 11-2, 11-3

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*D. Danehy*
Agency or Company	*Psomas*
Date Performed	*11/21/19*
Analysis Time Period	*2040 with Project Saturday*

Site Information

Highway/Direction of Travel	*US-101 NB*
From/To	*North of Santa Maria Way*
Jurisdiction	*Caltrans*
Analysis Year	*2040*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*1377*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*56200*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.05*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*1377*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*3*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*513*	pc/h/ln
S	*65.0*	mph
D = v_p / S	*7.9*	pc/mi/ln
LOS	*A*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 SB*
Agency or Company	*Psomas*	From/To	*North of Santa Maria Way*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*2040 with Project AM*	Analysis Year	*2040*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*3052*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*69209*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.09*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*3052*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	f_{HV} = $1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1707*	pc/h/ln
S	*63.7*	mph
D = v_p / S	*26.8*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*D. Danehy*
Agency or Company	*Psomas*
Date Performed	*11/21/19*
Analysis Time Period	*2040 with Project PM*

Site Information

Highway/Direction of Travel	*US-101 SB*
From/To	*North of Santa Maria Way*
Jurisdiction	*Caltrans*
Analysis Year	*2040*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*3689*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*69209*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.11*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*3689*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2063*	pc/h/ln
S	*58.8*	mph
D = v_p / S	*35.1*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 SB*
Agency or Company	*Psomas*	From/To	*North of Santa Maria Way*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*2040 with Project Saturday*	Analysis Year	*2040*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*1150*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*57500*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.04*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*1150*	veh/h	Grade % Length	*mi*
			Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	*2*		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	*65.0*	mph	FFS	*65.0*	mph
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures			Design (N)	
			Design (N)	
Operational (LOS)			Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*643*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	*65.0*	mph	S	mph
D = v_p / S	*9.9*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*A*		Required Number of Lanes, N	

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information / Site Information

Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 NB*
Agency or Company	*Psomas*	From/To	*South of Union Valley Parkway*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*2040 with Project AM*	Analysis Year	*2040*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*2232*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*43063*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.10*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*53*		General Terrain:	*Level*
DDHV = AADT x K x D	*2232*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1248*	pc/h/ln
S	*65.0*	mph
D = v_p / S	*19.2*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 NB*
Agency or Company	*Psomas*	From/To	*South of Union Valley Parkway*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*2040 with Project PM*	Analysis Year	*2040*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*2726*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*43063*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.12*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*51*		General Terrain:	*Level*
DDHV = AADT x K x D	*2726*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width		ft	f_{LW}		mph
Rt-Side Lat. Clearance		ft	f_{LC}		mph
Number of Lanes, N	*2*		TRD Adjustment		mph
Total Ramp Density, TRD		ramps/mi	FFS	*65.0*	mph
FFS (measured)	*65.0*	mph			
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures			Design (N)	
Operational (LOS)			Design (N)	
			Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1524*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	*64.8*	mph	S	mph
D = v_p / S	*23.5*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*C*		Required Number of Lanes, N	

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 NB*
Agency or Company	*Psomas*	From/To	*South of Union Valley Parkway*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*2040 with Project Saturday*	Analysis Year	*2040*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*1238*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*43063*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.05*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*60*		General Terrain:	*Level*
DDHV = AADT x K x D	*1238*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	*2*		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	*65.0*	mph	FFS	*65.0*	mph
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures			Design (N)	
Operational (LOS)			Design (N)	
			Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*692*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	*65.0*	mph	S	mph
D = v_p / S	*10.6*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*A*		Required Number of Lanes, N	

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 SB*
Agency or Company	*Psomas*	From/To	*South of Union Valley Parkway*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*2040 with Project AM*	Analysis Year	*2040*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*1983*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*43063*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.09*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*1983*	veh/h	Grade % Length	*mi*
			Up/Down %	

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	*2*		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	*65.0*	mph	FFS	*65.0*	mph
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures			Design (N)	
Operational (LOS)			Design (N)	
			Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1109*	pc/h/ln	v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	*65.0*	mph	S	mph
D = v_p / S	*17.1*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*B*		Required Number of Lanes, N	

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*D. Danehy*
Agency or Company	*Psomas*
Date Performed	*11/21/19*
Analysis Time Period	*2040 with Project PM*

Site Information

Highway/Direction of Travel	*US-101 SB*
From/To	*South of Union Valley Parkway*
Jurisdiction	*Caltrans*
Analysis Year	*2040*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*2584*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*43063*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.12*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*2584*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1445*	pc/h/ln
S	*65.0*	mph
D = v_p / S	*22.2*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 SB*
Agency or Company	*Psomas*	From/To	*South of Union Valley Parkway*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*2040 with Project Saturday*	Analysis Year	*2040*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*842*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*42100*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.04*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*842*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*471*	pc/h/ln
S	*65.0*	mph
D = v_p / S	*7.2*	pc/mi/ln
LOS	*A*	

Design (N)

Design (N)

Design LOS

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*D. Danehy*	Highway/Direction of Travel	*US-101 NB*
Agency or Company	*Psomas*	From/To	*UVP to Santa Maria Way*
Date Performed	*11/21/19*	Jurisdiction	*Caltrans*
Analysis Time Period	*2040 with Project AM*	Analysis Year	*2040*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*3139*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*61770*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.09*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*55*		General Terrain:	*Level*
DDHV = AADT x K x D	*3139*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1755*	pc/h/ln
S	*63.2*	mph
D = v_p / S	*27.8*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*D. Danehy*
Agency or Company	*Psomas*
Date Performed	*11/21/19*
Analysis Time Period	*2040 with Project PM*

Site Information

Highway/Direction of Travel	*US-101 NB*
From/To	*UVP to Santa Maria Way*
Jurisdiction	*Caltrans*
Analysis Year	*2040*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*3785*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*61770*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.12*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*53*		General Terrain:	*Level*
DDHV = AADT x K x D	*3785*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2117*	pc/h/ln
S	*57.7*	mph
D = v_p / S	*36.7*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*D. Danehy*
Agency or Company	*Psomas*
Date Performed	*11/21/19*
Analysis Time Period	*2040 with Project Saturday*

Site Information

Highway/Direction of Travel	*US-101 NB*
From/To	*UVP to Santa Maria Way*
Jurisdiction	*Caltrans*
Analysis Year	*2040*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*1869*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*61770*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.05*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*61*		General Terrain:	*Level*
DDHV = AADT x K x D	*1869*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	f_{HV} = $1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1045*	pc/h/ln
S	*65.0*	mph
D = v_p / S	*16.1*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*D. Danehy*
Agency or Company	*Psomas*
Date Performed	*11/21/19*
Analysis Time Period	*2040 with Project AM*

Site Information

Highway/Direction of Travel	*US-101 SB*
From/To	*UVP to Santa Maria Way*
Jurisdiction	*Caltrans*
Analysis Year	*2040*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*2557*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*61770*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.08*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*2557*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1430*	pc/h/ln
S	*65.0*	mph
D = v_p / S	*22.0*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*D. Danehy*
Agency or Company	*Psomas*
Date Performed	*11/21/19*
Analysis Time Period	*2040 with Project PM*

Site Information

Highway/Direction of Travel	*US-101 SB*
From/To	*UVP to Santa Maria Way*
Jurisdiction	*Caltrans*
Analysis Year	*2040*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*3314*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*61770*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.11*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*3314*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1853*	pc/h/ln
S	*62.1*	mph
D = v_p / S	*29.8*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information

Analyst	*D. Danehy*
Agency or Company	*Psomas*
Date Performed	*11/21/19*
Analysis Time Period	*2040 with Project Saturday*

Site Information

Highway/Direction of Travel	*US-101 SB*
From/To	*UVP to Santa Maria Way*
Jurisdiction	*Caltrans*
Analysis Year	*2040*

Project Description *Orcutt Community Plan Amendment*

☑ Oper.(LOS) ☐ Des.(N) ☑ Planning Data

Flow Inputs

Volume, V	*1172*	veh/h	Peak-Hour Factor, PHF	*0.92*
AADT	*58600*	veh/day	%Trucks and Buses, P_T	*5*
Peak-Hr Prop. of AADT, K	*0.04*		%RVs, P_R	*2*
Peak-Hr Direction Prop, D	*50*		General Terrain:	*Level*
DDHV = AADT x K x D	*1172*	veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.972*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*2*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*65.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*65.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*655*	pc/h/ln
S	*65.0*	mph
D = v_p / S	*10.1*	pc/mi/ln
LOS	*A*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
DDHV - Directional design hour volume
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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Appendix I – HCS Reports – Ramps (2019)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Santa Maria Way Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	AM Existing	Analysis Year	2019

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Number of Lanes, N	2
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	900
Freeway Volume, V_F	2625
Ramp Volume, V_R	188
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	2625	0.94	Level	5	0	0.976	1.00	2862
Ramp	188	0.94	Level	2	0	0.990	1.00	202
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 2862 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	2862	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	2660	Exhibit 13-8	4700	No
V_R	202	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2862	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 20.8 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

D_s = 0.381 (Exhibit 13-12)

S_R= 56.2 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 56.2 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Santa Maria Way Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	PM Existing	Analysis Year	2019

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Number of Lanes, N	2
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	900
Freeway Volume, V_F	3209
Ramp Volume, V_R	354
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	3209	0.94	Level	5	0	0.976	1.00	3499
Ramp	354	0.94	Level	2	0	0.990	1.00	380
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 3499 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	3499	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	3119	Exhibit 13-8	4700	No
V_R	380	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3499	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = 26.2 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

D_s = 0.397 (Exhibit 13-12)

S_R= 55.9 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 55.9 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Santa Maria Way Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	Saturday Existing	Analysis Year	2019

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp			Downstream Adj Ramp
☐ Yes ☐ On	Number of Lanes, N	2	☐ Yes ☐ On
☑ No ☐ Off	Acceleration Lane Length, L_A		☑ No ☐ Off
L_{up} = ft	Deceleration Lane Length L_D	900	L_{down} = ft
V_u = veh/h	Freeway Volume, V_F	1319	V_D = veh/h
	Ramp Volume, V_R	123	
	Freeway Free-Flow Speed, S_{FF}	65.0	
	Ramp Free-Flow Speed, S_{FR}	40.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1319	0.94	Level	5	0	0.976	1.00	1438
Ramp	123	0.94	Level	2	0	0.990	1.00	132
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 1438 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1438	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	1306	Exhibit 13-8	4700	No
V_R	132	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1438	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 8.5 (pc/mi/ln)

LOS = A (Exhibit 13-2)

Speed Determination

D_s = 0.375 (Exhibit 13-12)

S_R= 56.4 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 56.4 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Santa Maria Way On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	AM Existing	Analysis Year	2019

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	3
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	750
Deceleration Lane Length L_D	
Freeway Volume, V_F	2625
Ramp Volume, V_R	318
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2625	0.94	Level	5	2	0.972	1.00	2874
Ramp	318	0.94	Grade	5	2	0.972	1.00	348
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F\ (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.599 using Equation (Exhibit 13-6)

V_{12} = 1720 pc/h

V_3 or V_{av34} 1154 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3222	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2068	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 16.7 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.314 (Exhibit 13-11)

S_R= 57.8 mph (Exhibit 13-11)

S_0= 62.6 mph (Exhibit 13-11)

S = 59.4 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Santa Maria Way On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	PM Existing	Analysis Year	2019

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	3
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	750
Deceleration Lane Length L_D	
Freeway Volume, V_F	3209
Ramp Volume, V_R	432
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	3209	0.94	Level	5	2	0.972	1.00	3513
Ramp	432	0.94	Grade	5	2	0.972	1.00	473
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.599 using Equation (Exhibit 13-6)

V_{12} = 2103 pc/h

V_3 or V_{av34} 1410 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3986	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2576	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$$

D_R = 20.6 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.335 (Exibit 13-11)

S_R= 57.3 mph (Exhibit 13-11)

S_0= 61.7 mph (Exhibit 13-11)

S = 58.8 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Santa Maria Way On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	Saturday Existing	Analysis Year	2019

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	3
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	750
Deceleration Lane Length L_D	
Freeway Volume, V_F	1319
Ramp Volume, V_R	123
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1319	0.94	Level	5	2	0.972	1.00	1444
Ramp	123	0.94	Grade	5	2	0.972	1.00	135
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.599 using Equation (Exhibit 13-6)

V_{12} = 864 pc/h

V_3 or V_{av34} 580 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1579	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	999	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 8.5 (pc/mi/ln)

LOS = A (Exhibit 13-2)

Speed Determination

M_S = 0.294 (Exibit 13-11)

S_R= 58.2 mph (Exhibit 13-11)

S_0= 64.7 mph (Exhibit 13-11)

S = 60.5 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Santa Maria Way Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	AM Existing	Analysis Year	2019

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Number of Lanes, N	2
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	1500
Freeway Volume, V_F	2820
Ramp Volume, V_R	487
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2820	0.94	Level	5	0	0.976	1.00	3075
Ramp	487	0.94	Level	2	0	0.990	1.00	523
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)
P_{FM} = using Equation (Exhibit 13-6)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)
S_R= mph (Exhibit 13-11)
S_0= mph (Exhibit 13-11)
S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)
P_{FD} = 1.000 using Equation (Exhibit 13-7)
V_{12} = 3075 pc/h
V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	3075	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	2552	Exhibit 13-8	4700	No
V_R	523	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3075	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = 17.2 (pc/mi/ln)
LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.410 (Exhibit 13-12)
S_R= 55.6 mph (Exhibit 13-12)
S_0= N/A mph (Exhibit 13-12)
S = 55.6 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Santa Maria Way Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	PM Existing	Analysis Year	2019

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	1500
Freeway Volume, V_F	3447
Ramp Volume, V_R	509
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	3447	0.94	Level	5	0	0.976	1.00	3759
Ramp	509	0.94	Level	2	0	0.990	1.00	547
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F\,(P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 3759 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	3759	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	3212	Exhibit 13-8	4700	No
V_R	547	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3759	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = 23.1 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

D_s = 0.412 (Exhibit 13-12)

S_R= 55.5 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 55.5 mph (Exhibit 13-13)

 HCS2010™ Version 6.41 Generated: 12/16/2019 8:20 AM

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Santa Maria Way Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	Saturday Existing	Analysis Year	2019

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp			Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N	2	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N	1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A		L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D	1500	V_D = veh/h
	Freeway Volume, V_F	997	
	Ramp Volume, V_R	212	
	Freeway Free-Flow Speed, S_{FF}	65.0	
	Ramp Free-Flow Speed, S_{FR}	40.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	997	0.94	Level	5	0	0.976	1.00	1087
Ramp	212	0.94	Level	2	0	0.990	1.00	228
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F\,(P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 1087 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1087	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	859	Exhibit 13-8	4700	No
V_R	228	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1087	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = 0.1 (pc/mi/ln)

LOS = A (Exhibit 13-2)

Speed Determination

D_s = 0.384 (Exhibit 13-12)

S_R= 56.2 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 56.2 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Santa Maria Way On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	AM Existing	Analysis Year	2019

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	1000
Deceleration Lane Length L_D	
Freeway Volume, V_F	2820
Ramp Volume, V_R	220
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2820	0.94	Level	5	2	0.972	1.00	3087
Ramp	220	0.94	Grade	5	2	0.972	1.00	241
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 3087 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3328	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3328	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 25.1 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.380 (Exibit 13-11)

S_R= 56.3 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 56.3 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Santa Maria Way On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	PM Existing	Analysis Year	2019

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	1000
Deceleration Lane Length L_D	
Freeway Volume, V_F	3447
Ramp Volume, V_R	221
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	3447	0.94	Level	5	2	0.972	1.00	3773
Ramp	221	0.94	Grade	5	2	0.972	1.00	242
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F\,(P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 3773 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	4015	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4015	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$$

D_R = 30.4 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.487 (Exibit 13-11)

S_R= 53.8 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 53.8 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

HCS2010™ Version 6.41 Generated: 12/16/2019 8:25 AM

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Santa Maria Way On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	Saturday Existing	Analysis Year	2019

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	1000
Deceleration Lane Length L_D	
Freeway Volume, V_F	997
Ramp Volume, V_R	349
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	997	0.94	Level	5	2	0.972	1.00	1091
Ramp	349	0.94	Grade	5	2	0.972	1.00	382
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)
P_{FM} = 1.000 using Equation (Exhibit 13-6)
V_{12} = 1091 pc/h
V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☑ No
If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1473	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1473	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 10.5 (pc/mi/ln)
LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.288 (Exibit 13-11)
S_R= 58.4 mph (Exhibit 13-11)
S_0= N/A mph (Exhibit 13-11)
S = 58.4 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)
P_{FD} = using Equation (Exhibit 13-7)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☐ No
If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)
S_R= mph (Exhibit 13-12)
S_0= mph (Exhibit 13-12)
S = mph (Exhibit 13-13)

 HCS2010™ Version 6.41 Generated: 12/16/2019 8:25 AM

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Union Valley Parkway Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	AM Existing	Analysis Year	2019

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	1340
Freeway Volume, V_F	1805
Ramp Volume, V_R	92
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1805	0.94	Level	5	0	0.976	1.00	1968
Ramp	92	0.94	Level	2	0	0.990	1.00	99
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)
P_{FM} = using Equation (Exhibit 13-6)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)
S_R= mph (Exhibit 13-11)
S_0= mph (Exhibit 13-11)
S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)
P_{FD} = 1.000 using Equation (Exhibit 13-7)
V_{12} = 1968 pc/h
V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1968	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	1869	Exhibit 13-8	4700	No
V_R	99	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1968	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 9.1 (pc/mi/ln)
LOS = A (Exhibit 13-2)

Speed Determination

D_s = 0.372 (Exhibit 13-12)
S_R= 56.4 mph (Exhibit 13-12)
S_0= N/A mph (Exhibit 13-12)
S = 56.4 mph (Exhibit 13-13)

 HCS2010TM Version 6.41 Generated: 12/16/2019 8:27 AM

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Union Valley Parkway Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	PM Existing	Analysis Year	2019

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	1340
Freeway Volume, V_F	2207
Ramp Volume, V_R	112
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2207	0.94	Level	5	0	0.976	1.00	2407
Ramp	112	0.94	Level	2	0	0.990	1.00	120
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F\,(P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\,v_R + 0.0078\,V_{12} - 0.00627\,L_A$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 2407 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	2407	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	2287	Exhibit 13-8	4700	No
V_R	120	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2407	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\,V_{12} - 0.009\,L_D$$

D_R = 12.9 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.374 (Exhibit 13-12)

S_R= 56.4 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 56.4 mph (Exhibit 13-13)

 HCS2010™ Version 6.41 Generated: 12/16/2019 8:27 AM

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Union Valley Parkway Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	Saturday Existing	Analysis Year	2019

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	1340
Freeway Volume, V_F	907
Ramp Volume, V_R	40
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	907	0.94	Level	5	0	0.976	1.00	989
Ramp	40	0.94	Level	2	0	0.990	1.00	43
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 989 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	989	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	946	Exhibit 13-8	4700	No
V_R	43	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	989	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$$

D_R = 0.7 (pc/mi/ln)

LOS = A (Exhibit 13-2)

Speed Determination

D_s = 0.367 (Exhibit 13-12)

S_R= 56.6 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 56.6 mph (Exhibit 13-13)

 HCS2010™ Version 6.41 Generated: 12/16/2019 8:28 AM

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Union Valley Parkway On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	AM Existing	Analysis Year	2019

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Number of Lanes, N	2
Acceleration Lane Length, L_A	1260
Deceleration Lane Length L_D	
Freeway Volume, V_F	1805
Ramp Volume, V_R	933
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1805	0.94	Level	5	2	0.972	1.00	1976
Ramp	933	0.94	Level	5	2	0.972	1.00	1021
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1976 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	2997	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2997	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 20.5 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.336 (Exibit 13-11)

S_R= 57.3 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 57.3 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Union Valley Parkway On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	PM Existing	Analysis Year	2019

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Number of Lanes, N	2
Acceleration Lane Length, L_A	1260
Deceleration Lane Length L_D	
Freeway Volume, V_F	2207
Ramp Volume, V_R	731
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2207	0.94	Level	5	2	0.972	1.00	2416
Ramp	731	0.94	Level	5	2	0.972	1.00	800
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F\,(P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 2416 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3216	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3216	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 22.3 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.355 (Exibit 13-11)

S_R= 56.8 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 56.8 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

 HCS2010™ Version 6.1 Generated: 11/21/2019 1:08 PM

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Union Valley Parkway On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	Saturday Existing	Analysis Year	2019

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Number of Lanes, N	2
Acceleration Lane Length, L_A	1260
Deceleration Lane Length L_D	
Freeway Volume, V_F	907
Ramp Volume, V_R	270
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	907	0.94	Level	5	2	0.972	1.00	993
Ramp	270	0.94	Grade	5	2	0.972	1.00	296
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 993 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1289	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1289	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 7.5 (pc/mi/ln)

LOS = A (Exhibit 13-2)

Speed Determination

M_S = 0.272 (Exibit 13-11)

S_R= 58.7 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 58.7 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

 HCS2010™ Version 6.1 Generated: 11/21/2019 1:08 PM

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Union Valley Parkway Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	AM Existing	Analysis Year	2019

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Number of Lanes, N	2
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	1030
Freeway Volume, V_F	2326
Ramp Volume, V_R	664
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	2326	0.94	Level	5	0	0.976	1.00	2536
Ramp	664	0.94	Mountainous	2	0	0.935	1.00	756
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 2536 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	2536	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	1780	Exhibit 13-8	4700	No
V_R	756	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2536	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 16.8 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.431 (Exhibit 13-12)

S_R= 55.1 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 55.1 mph (Exhibit 13-13)

 HCS2010™ Version 6.1 Generated: 11/21/2019 12:57 PM

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Union Valley Parkway Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	PM Existing	Analysis Year	2019

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Number of Lanes, N	2
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	1030
Freeway Volume, V_F	2843
Ramp Volume, V_R	823
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	2843	0.94	Level	5	0	0.976	1.00	3100
Ramp	823	0.94	Mountainous	2	0	0.935	1.00	937
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F\ (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 3100 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	3100	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	2163	Exhibit 13-8	4700	No
V_R	937	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3100	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 21.6 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

D_s = 0.447 (Exhibit 13-12)

S_R= 54.7 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 54.7 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Union Valley Parkway Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	Saturday Existing	Analysis Year	2019

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp			Downstream Adj Ramp
☐ Yes ☐ On	Number of Lanes, N	2	☐ Yes ☐ On
☑ No ☐ Off	Acceleration Lane Length, L_A		☑ No ☐ Off
L_{up} = ft	Deceleration Lane Length L_D	1030	L_{down} = ft
V_u = veh/h	Freeway Volume, V_F	1169	V_D = veh/h
	Ramp Volume, V_R	494	
	Freeway Free-Flow Speed, S_{FF}	65.0	
	Ramp Free-Flow Speed, S_{FR}	40.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1169	0.94	Level	5	0	0.976	1.00	1275
Ramp	494	0.94	Mountainous	2	0	0.935	1.00	562
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 1275 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1275	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	713	Exhibit 13-8	4700	No
V_R	562	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1275	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 5.9 (pc/mi/ln)

LOS = A (Exhibit 13-2)

Speed Determination

D_s = 0.414 (Exhibit 13-12)

S_R= 55.5 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 55.5 mph (Exhibit 13-13)

 HCS2010™ Version 6.1 Generated: 11/21/2019 12:56 PM

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Union Valley Parkway On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	AM Existing	Analysis Year	2019

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	1360
Deceleration Lane Length L_D	
Freeway Volume, V_F	2326
Ramp Volume, V_R	113
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2326	0.94	Level	5	2	0.972	1.00	2546
Ramp	113	0.94	Grade	5	2	0.972	1.00	124
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 2546 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	2670	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2670	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 17.7 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.309 (Exibit 13-11)

S_R= 57.9 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 57.9 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

 HCS2010™ Version 6.41 Generated: 12/16/2019 8:29 AM

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Union Valley Parkway On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	PM Existing	Analysis Year	2019

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	1360
Deceleration Lane Length L_D	
Freeway Volume, V_F	2843
Ramp Volume, V_R	60
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2843	0.94	Level	5	2	0.972	1.00	3112
Ramp	60	0.94	Grade	5	2	0.972	1.00	66
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F\,(P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 3112 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3178	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3178	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$$

D_R = 21.7 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.347 (Exibit 13-11)

S_R= 57.0 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 57.0 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Union Valley Parkway On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	Saturday Existing	Analysis Year	2019

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	1360
Deceleration Lane Length L_D	
Freeway Volume, V_F	1169
Ramp Volume, V_R	22
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1169	0.94	Level	5	2	0.972	1.00	1280
Ramp	22	0.94	Grade	5	2	0.972	1.00	24
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1280 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1304	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1304	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$$

D_R = 7.1 (pc/mi/ln)

LOS = A (Exhibit 13-2)

Speed Determination

M_S = 0.267 (Exibit 13-11)

S_R= 58.9 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 58.9 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

 HCS2010™ Version 6.41 Generated: 12/16/2019 8:30 AM

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Santa Maria Way Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	AM Existing	Analysis Year	2019 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	900
Freeway Volume, V_F	2623
Ramp Volume, V_R	186
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	2623	0.94	Level	5	0	0.976	1.00	2860
Ramp	186	0.94	Level	2	0	0.990	1.00	200
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 2860 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	2860	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	2660	Exhibit 13-8	4700	No
V_R	200	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2860	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 20.7 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

D_s = 0.381 (Exhibit 13-12)

S_R= 56.2 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 56.2 mph (Exhibit 13-13)

 HCS2010™ Version 6.41 Generated: 12/16/2019 8:36 AM

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Santa Maria Way Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	PM Existing	Analysis Year	2019 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	900
Freeway Volume, V_F	3213
Ramp Volume, V_R	353
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	3213	0.94	Level	5	0	0.976	1.00	3504
Ramp	353	0.94	Level	2	0	0.990	1.00	379
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 3504 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	3504	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	3125	Exhibit 13-8	4700	No
V_R	379	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3504	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = 26.3 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

D_s = 0.397 (Exhibit 13-12)

S_R= 55.9 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 55.9 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Santa Maria Way Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	Saturday Existing	Analysis Year	2019 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	900
Freeway Volume, V_F	1498
Ramp Volume, V_R	100
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1498	0.94	Level	5	0	0.976	1.00	1633
Ramp	100	0.94	Level	2	0	0.990	1.00	107
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)
P_{FM} = using Equation (Exhibit 13-6)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)
S_R= mph (Exhibit 13-11)
S_0= mph (Exhibit 13-11)
S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)
P_{FD} = 1.000 using Equation (Exhibit 13-7)
V_{12} = 1633 pc/h
V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1633	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	1526	Exhibit 13-8	4700	No
V_R	107	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1633	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = 10.2 (pc/mi/ln)
LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.373 (Exhibit 13-12)
S_R= 56.4 mph (Exhibit 13-12)
S_0= N/A mph (Exhibit 13-12)
S = 56.4 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Santa Maria Way On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	AM Existing	Analysis Year	2019 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 3	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 750	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 2623	
	Ramp Volume, V_R: 318	
	Freeway Free-Flow Speed, S_{FF}: 65.0	
	Ramp Free-Flow Speed, S_{FR}: 25.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2623	0.94	Level	5	2	0.972	1.00	2871
Ramp	318	0.94	Grade	5	2	0.972	1.00	348
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.599 using Equation (Exhibit 13-6)

V_{12} = 1718 pc/h

V_3 or V_{av34} 1153 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3219	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2066	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 16.7 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.314 (Exhibit 13-11)

S_R= 57.8 mph (Exhibit 13-11)

S_0= 62.6 mph (Exhibit 13-11)

S = 59.4 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Santa Maria Way On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	PM Existing	Analysis Year	2019 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	3
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	750
Deceleration Lane Length L_D	
Freeway Volume, V_F	3213
Ramp Volume, V_R	432
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	3213	0.94	Level	5	2	0.972	1.00	3517
Ramp	432	0.94	Grade	5	2	0.972	1.00	473
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.599 using Equation (Exhibit 13-6)

V_{12} = 2105 pc/h

V_3 or V_{av34} 1412 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3990	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2578	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$$

D_R = 20.7 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.335 (Exhibit 13-11)

S_R= 57.3 mph (Exhibit 13-11)

S_0= 61.7 mph (Exhibit 13-11)

S = 58.8 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Santa Maria Way On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	Saturday Existing	Analysis Year	2019 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp			Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N	3	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N	1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A	750	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D		V_D = veh/h
	Freeway Volume, V_F	1498	
	Ramp Volume, V_R	123	
	Freeway Free-Flow Speed, S_{FF}	65.0	
	Ramp Free-Flow Speed, S_{FR}	25.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1498	0.94	Level	5	2	0.972	1.00	1640
Ramp	123	0.94	Grade	5	2	0.972	1.00	135
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.599 using Equation (Exhibit 13-6)

V_{12} = 982 pc/h

V_3 or V_{av34} 658 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1775	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1117	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$$

D_R = 9.4 (pc/mi/ln)

LOS = A (Exhibit 13-2)

Speed Determination

M_S = 0.295 (Exibit 13-11)

S_R= 58.2 mph (Exhibit 13-11)

S_0= 64.4 mph (Exhibit 13-11)

S = 60.4 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Santa Maria Way Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	AM Existing	Analysis Year	2019 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	1500
Freeway Volume, V_F	2820
Ramp Volume, V_R	487
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2820	0.94	Level	5	0	0.976	1.00	3075
Ramp	487	0.94	Level	2	0	0.990	1.00	523
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 3075 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	3075	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	2552	Exhibit 13-8	4700	No
V_R	523	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3075	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 17.2 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.410 (Exhibit 13-12)

S_R= 55.6 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 55.6 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Santa Maria Way Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	PM Existing	Analysis Year	2019 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	1500
Freeway Volume, V_F	3447
Ramp Volume, V_R	509
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	3447	0.94	Level	5	0	0.976	1.00	3759
Ramp	509	0.94	Level	2	0	0.990	1.00	547
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F\ (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 3759 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	3759	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	3212	Exhibit 13-8	4700	No
V_R	547	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3759	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 23.1 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

D_s = 0.412 (Exhibit 13-12)

S_R= 55.5 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 55.5 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Santa Maria Way Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	Saturday Existing	Analysis Year	2019 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp	Freeway Data		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N	2	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N	1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A		L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D	1500	V_D = veh/h
	Freeway Volume, V_F	997	
	Ramp Volume, V_R	212	
	Freeway Free-Flow Speed, S_{FF}	65.0	
	Ramp Free-Flow Speed, S_{FR}	40.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	997	0.94	Level	5	0	0.976	1.00	1087
Ramp	212	0.94	Level	2	0	0.990	1.00	228
UpStream								
DownStream								

Merge Areas	Diverge Areas

Estimation of v_{12} (Merge Areas)

$V_{12} = V_F\,(P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Estimation of v_{12} (Diverge Areas)

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 1087 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks (Merge)

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Capacity Checks (Diverge)

	Actual	Capacity		LOS F?
V_F	1087	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	859	Exhibit 13-8	4700	No
V_R	228	Exhibit 13-10	2100	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1087	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F) (Merge)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Level of Service Determination (if not F) (Diverge)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 0.1 (pc/mi/ln)

LOS = A (Exhibit 13-2)

Speed Determination (Merge)

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Speed Determination (Diverge)

D_s = 0.384 (Exhibit 13-12)

S_R= 56.2 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 56.2 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Santa Maria Way On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	AM Existing	Analysis Year	2019 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	1000
Deceleration Lane Length L_D	
Freeway Volume, V_F	2820
Ramp Volume, V_R	218
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2820	0.94	Level	5	2	0.972	1.00	3087
Ramp	218	0.94	Grade	5	2	0.972	1.00	239
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 3087 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3326	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3326	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$$

D_R = 25.0 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.380 (Exibit 13-11)

S_R= 56.3 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 56.3 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Santa Maria Way On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	PM Existing	Analysis Year	2019 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	1000
Deceleration Lane Length L_D	
Freeway Volume, V_F	3447
Ramp Volume, V_R	213
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	3447	0.94	Level	5	2	0.972	1.00	3773
Ramp	213	0.94	Grade	5	2	0.972	1.00	233
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)
P_{FM} = 1.000 using Equation (Exhibit 13-6)
V_{12} = 3773 pc/h
V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	4006	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4006	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$$

D_R = 30.3 (pc/mi/ln)
LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.485 (Exibit 13-11)
S_R= 53.8 mph (Exhibit 13-11)
S_0= N/A mph (Exhibit 13-11)
S = 53.8 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)
P_{FD} = using Equation (Exhibit 13-7)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$$

D_R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)
S_R= mph (Exhibit 13-12)
S_0= mph (Exhibit 13-12)
S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Santa Maria Way On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	Saturday Existing	Analysis Year	2019 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	1000
Deceleration Lane Length L_D	
Freeway Volume, V_F	997
Ramp Volume, V_R	118
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	997	0.94	Level	5	2	0.972	1.00	1091
Ramp	118	0.94	Grade	5	2	0.972	1.00	129
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1091 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1220	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1220	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 8.7 (pc/mi/ln)

LOS = A (Exhibit 13-2)

Speed Determination

M_S = 0.284 (Exibit 13-11)

S_R= 58.5 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 58.5 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Union Valley Parkway Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	AM Existing	Analysis Year	2019 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	1340
Freeway Volume, V_F	1805
Ramp Volume, V_R	93
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1805	0.94	Level	5	0	0.976	1.00	1968
Ramp	93	0.94	Level	2	0	0.990	1.00	100
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F\,(P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 1968 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1968	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	1868	Exhibit 13-8	4700	No
V_R	100	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1968	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$$

D_R = 9.1 (pc/mi/ln)

LOS = A (Exhibit 13-2)

Speed Determination

D_s = 0.372 (Exhibit 13-12)

S_R= 56.4 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 56.4 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Union Valley Parkway Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	PM Existing	Analysis Year	2019 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	1340
Freeway Volume, V_F	2206
Ramp Volume, V_R	112
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2206	0.94	Level	5	0	0.976	1.00	2405
Ramp	112	0.94	Level	2	0	0.990	1.00	120
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F\,(P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 2405 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	2405	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	2285	Exhibit 13-8	4700	No
V_R	120	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2405	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = 12.9 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.374 (Exhibit 13-12)

S_R= 56.4 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 56.4 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Union Valley Parkway Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	Saturday Existing	Analysis Year	2019 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	1340
Freeway Volume, V_F	905
Ramp Volume, V_R	60
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	905	0.94	Level	5	0	0.976	1.00	987
Ramp	60	0.94	Level	2	0	0.990	1.00	64
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 987 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	987	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	923	Exhibit 13-8	4700	No
V_R	64	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	987	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = 0.7 (pc/mi/ln)

LOS = A (Exhibit 13-2)

Speed Determination

D_s = 0.369 (Exhibit 13-12)

S_R= 56.5 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 56.5 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Union Valley Parkway On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	AM Existing	Analysis Year	2019 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	1260
Deceleration Lane Length L_D	
Freeway Volume, V_F	1805
Ramp Volume, V_R	933
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1805	0.94	Level	5	2	0.972	1.00	1976
Ramp	933	0.94	Level	5	2	0.972	1.00	1021
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1976 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	2997	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2997	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$$

D_R = 20.5 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.336 (Exibit 13-11)

S_R= 57.3 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 57.3 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Union Valley Parkway On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	PM Existing	Analysis Year	2019 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp			Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N	2	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N	1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A	1260	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D		V_D = veh/h
	Freeway Volume, V_F	2206	
	Ramp Volume, V_R	736	
	Freeway Free-Flow Speed, S_{FF}	65.0	
	Ramp Free-Flow Speed, S_{FR}	25.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	2206	0.94	Level	5	2	0.972	1.00	2415
Ramp	736	0.94	Level	5	2	0.972	1.00	806
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 2415 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3221	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3221	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 22.3 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.356 (Exibit 13-11)

S_R= 56.8 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 56.8 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Union Valley Parkway On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	Saturday Existing	Analysis Year	2019 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	1260
Deceleration Lane Length L_D	
Freeway Volume, V_F	905
Ramp Volume, V_R	472
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	905	0.94	Level	5	2	0.972	1.00	991
Ramp	472	0.94	Grade	5	2	0.972	1.00	517
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 991 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1508	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1508	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 9.1 (pc/mi/ln)

LOS = A (Exhibit 13-2)

Speed Determination

M_S = 0.276 (Exibit 13-11)

S_R= 58.7 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 58.7 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Union Valley Parkway Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	AM Existing	Analysis Year	2019 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	1030
Freeway Volume, V_F	2324
Ramp Volume, V_R	664
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2324	0.94	Level	5	0	0.976	1.00	2534
Ramp	664	0.94	Mountainous	2	0	0.935	1.00	756
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 2534 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	2534	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	1778	Exhibit 13-8	4700	No
V_R	756	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2534	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 16.8 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.431 (Exhibit 13-12)

S_R= 55.1 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 55.1 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Union Valley Parkway Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	PM Existing	Analysis Year	2019 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	1030
Freeway Volume, V_F	2835
Ramp Volume, V_R	823
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2835	0.94	Level	5	0	0.976	1.00	3091
Ramp	823	0.94	Mountainous	2	0	0.935	1.00	937
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 3091 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	3091	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	2154	Exhibit 13-8	4700	No
V_R	937	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3091	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$$

D_R = 21.6 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

D_s = 0.447 (Exhibit 13-12)

S_R= 54.7 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 54.7 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Union Valley Parkway Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	Saturday Existing	Analysis Year	2019 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	1030
Freeway Volume, V_F	938
Ramp Volume, V_R	494
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	938	0.94	Level	5	0	0.976	1.00	1023
Ramp	494	0.94	Level	2	0	0.990	1.00	531
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 1023 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1023	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	492	Exhibit 13-8	4700	No
V_R	531	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1023	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 3.8 (pc/mi/ln)

LOS = A (Exhibit 13-2)

Speed Determination

D_s = 0.411 (Exhibit 13-12)

S_R= 55.6 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 55.6 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Union Valley Parkway On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	AM Existing	Analysis Year	2019 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 2	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A: 1360	L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 2324	
	Ramp Volume, V_R: 113	
	Freeway Free-Flow Speed, S_{FF}: 65.0	
	Ramp Free-Flow Speed, S_{FR}: 25.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	2324	0.94	Level	5	2	0.972	1.00	2544
Ramp	113	0.94	Grade	5	2	0.972	1.00	124
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 2544 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	2668	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2668	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 17.7 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.309 (Exibit 13-11)

S_R= 57.9 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 57.9 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

HCS2010™ Version 6.41 Generated: 12/16/2019 8:53 AM

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Union Valley Parkway On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	PM Existing	Analysis Year	2019 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	1360
Deceleration Lane Length L_D	
Freeway Volume, V_F	2835
Ramp Volume, V_R	60
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2835	0.94	Level	5	2	0.972	1.00	3103
Ramp	60	0.94	Grade	5	2	0.972	1.00	66
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 3103 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3169	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3169	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 21.6 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.346 (Exibit 13-11)

S_R= 57.0 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 57.0 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Union Valley Parkway On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	Saturday Existing	Analysis Year	2019 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	1360
Deceleration Lane Length L_D	
Freeway Volume, V_F	938
Ramp Volume, V_R	22
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	938	0.94	Level	5	2	0.972	1.00	1027
Ramp	22	0.94	Grade	5	2	0.972	1.00	24
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1027 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1051	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1051	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$$

D_R = 5.1 (pc/mi/ln)

LOS = A (Exhibit 13-2)

Speed Determination

M_S = 0.264 (Exibit 13-11)

S_R= 58.9 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 58.9 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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Appendix J – HCS Reports – Ramps (2025)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Santa Maria Way Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	AM 2025	Analysis Year	2025

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	900
Freeway Volume, V_F	2882
Ramp Volume, V_R	412
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	2882	0.94	Level	5	0	0.976	1.00	3143
Ramp	412	0.94	Level	2	0	0.990	1.00	443
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 3143 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	3143	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	2700	Exhibit 13-8	4700	No
V_R	443	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3143	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = 23.2 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

D_s = 0.403 (Exhibit 13-12)

S_R= 55.7 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 55.7 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Santa Maria Way Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	PM 2025	Analysis Year	2025

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	900
Freeway Volume, V_F	3526
Ramp Volume, V_R	651
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	3526	0.94	Level	5	0	0.976	1.00	3845
Ramp	651	0.94	Level	2	0	0.990	1.00	699
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F\,(P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 3845 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	3845	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	3146	Exhibit 13-8	4700	No
V_R	699	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3845	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = 29.2 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.426 (Exhibit 13-12)

S_R= 55.2 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 55.2 mph (Exhibit 13-13)

 HCS2010™ Version 6.41 Generated: 12/16/2019 7:10 AM

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Santa Maria Way Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	Saturday 2025	Analysis Year	2025

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	900
Freeway Volume, V_F	1507
Ramp Volume, V_R	304
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1507	0.94	Level	5	0	0.976	1.00	1643
Ramp	304	0.94	Level	2	0	0.990	1.00	327
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 1643 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1643	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	1316	Exhibit 13-8	4700	No
V_R	327	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1643	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$$

D_R = 10.3 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.392 (Exhibit 13-12)

S_R= 56.0 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 56.0 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Santa Maria Way On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	AM 2025	Analysis Year	2025

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	3
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	750
Deceleration Lane Length L_D	
Freeway Volume, V_F	2882
Ramp Volume, V_R	348
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2882	0.94	Level	5	2	0.972	1.00	3155
Ramp	348	0.94	Grade	5	2	0.972	1.00	381
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.599 using Equation (Exhibit 13-6)

V_{12} = 1888 pc/h

V_3 or V_{av34} 1267 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3536	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2269	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 18.3 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.321 (Exibit 13-11)

S_R= 57.6 mph (Exhibit 13-11)

S_0= 62.2 mph (Exhibit 13-11)

S = 59.2 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Santa Maria Way On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	PM 2025	Analysis Year	2025

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	3
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	750
Deceleration Lane Length L_D	
Freeway Volume, V_F	3526
Ramp Volume, V_R	448
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	3526	0.94	Level	5	2	0.972	1.00	3860
Ramp	448	0.94	Grade	5	2	0.972	1.00	490
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F\,(P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.599 using Equation (Exhibit 13-6)

V_{12} = 2310 pc/h

V_3 or V_{av34} 1550 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	4350	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2800	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 22.4 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.348 (Exibit 13-11)

S_R= 57.0 mph (Exhibit 13-11)

S_0= 61.2 mph (Exhibit 13-11)

S = 58.4 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Santa Maria Way On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	Saturday 2025	Analysis Year	2025

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	3
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	750
Deceleration Lane Length L_D	
Freeway Volume, V_F	1507
Ramp Volume, V_R	127
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1507	0.94	Level	5	2	0.972	1.00	1650
Ramp	127	0.94	Grade	5	2	0.972	1.00	139
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.599 using Equation (Exhibit 13-6)

V_{12} = 988 pc/h

V_3 or V_{av34} 662 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1789	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1127	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$$

D_R = 9.5 (pc/mi/ln)

LOS = A (Exhibit 13-2)

Speed Determination

M_S = 0.296 (Exhibit 13-11)

S_R= 58.2 mph (Exhibit 13-11)

S_0= 64.4 mph (Exhibit 13-11)

S = 60.4 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Santa Maria Way Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	AM 2025	Analysis Year	2025

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	1500
Freeway Volume, V_F	2875
Ramp Volume, V_R	531
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2875	0.94	Level	5	0	0.976	1.00	3135
Ramp	531	0.94	Level	2	0	0.990	1.00	571
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 3135 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	3135	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	2564	Exhibit 13-8	4700	No
V_R	571	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3135	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 17.7 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.414 (Exhibit 13-12)

S_R= 55.5 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 55.5 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Santa Maria Way Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	PM 2025	Analysis Year	2025

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	1500
Freeway Volume, V_F	3501
Ramp Volume, V_R	529
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	3501	0.94	Level	5	0	0.976	1.00	3818
Ramp	529	0.94	Level	2	0	0.990	1.00	568
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 3818 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	3818	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	3250	Exhibit 13-8	4700	No
V_R	568	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3818	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = 23.6 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

D_s = 0.414 (Exhibit 13-12)

S_R= 55.5 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 55.5 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Santa Maria Way Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	Saturday 2025	Analysis Year	2025

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	1500
Freeway Volume, V_F	1027
Ramp Volume, V_R	216
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1027	0.94	Level	5	0	0.976	1.00	1120
Ramp	216	0.94	Level	2	0	0.990	1.00	232
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 1120 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1120	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	888	Exhibit 13-8	4700	No
V_R	232	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1120	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = 0.4 (pc/mi/ln)

LOS = A (Exhibit 13-2)

Speed Determination

D_s = 0.384 (Exhibit 13-12)

S_R= 56.2 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 56.2 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Santa Maria Way On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	AM 2025	Analysis Year	2025

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	1000
Deceleration Lane Length L_D	
Freeway Volume, V_F	2875
Ramp Volume, V_R	354
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2875	0.94	Level	5	2	0.972	1.00	3147
Ramp	354	0.94	Grade	5	2	0.972	1.00	388
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 3147 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3535	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3535	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 26.6 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.405 (Exibit 13-11)

S_R= 55.7 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 55.7 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Santa Maria Way On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	PM 2025	Analysis Year	2025

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	1000
Deceleration Lane Length L_D	
Freeway Volume, V_F	3501
Ramp Volume, V_R	556
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	3501	0.94	Level	5	2	0.972	1.00	3832
Ramp	556	0.94	Grade	5	2	0.972	1.00	609
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 3832 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	4441	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4441	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 33.6 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.602 (Exibit 13-11)

S_R= 51.2 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 51.2 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Santa Maria Way On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	Saturday 2025	Analysis Year	2025

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	1000
Deceleration Lane Length L_D	
Freeway Volume, V_F	1027
Ramp Volume, V_R	523
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1027	0.94	Level	5	2	0.972	1.00	1124
Ramp	523	0.94	Grade	5	2	0.972	1.00	573
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1124 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1697	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1697	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 12.2 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.292 (Exibit 13-11)

S_R= 58.3 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 58.3 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Union Valley Parkway Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	AM 2025	Analysis Year	2025

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	1340
Freeway Volume, V_F	2033
Ramp Volume, V_R	96
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2033	0.94	Level	5	0	0.976	1.00	2217
Ramp	96	0.94	Level	2	0	0.990	1.00	103
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F\,(P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)
P_{FM} = using Equation (Exhibit 13-6)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)
S_R= mph (Exhibit 13-11)
S_0= mph (Exhibit 13-11)
S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)
P_{FD} = 1.000 using Equation (Exhibit 13-7)
V_{12} = 2217 pc/h
V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	2217	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	2114	Exhibit 13-8	4700	No
V_R	103	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2217	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = 11.3 (pc/mi/ln)
LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.372 (Exhibit 13-12)
S_R= 56.4 mph (Exhibit 13-12)
S_0= N/A mph (Exhibit 13-12)
S = 56.4 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Union Valley Parkway Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	PM 2025	Analysis Year	2025

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	1340
Freeway Volume, V_F	2515
Ramp Volume, V_R	123
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2515	0.94	Level	5	0	0.976	1.00	2742
Ramp	123	0.94	Level	2	0	0.990	1.00	132
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 2742 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	2742	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	2610	Exhibit 13-8	4700	No
V_R	132	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2742	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$$

D_R = 15.8 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.375 (Exhibit 13-12)

S_R= 56.4 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 56.4 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Union Valley Parkway Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	Saturday 2025	Analysis Year	2025

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	1340
Freeway Volume, V_F	1096
Ramp Volume, V_R	48
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1096	0.94	Level	5	0	0.976	1.00	1195
Ramp	48	0.94	Level	2	0	0.990	1.00	52
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 1195 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1195	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	1143	Exhibit 13-8	4700	No
V_R	52	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1195	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = 2.5 (pc/mi/ln)

LOS = A (Exhibit 13-2)

Speed Determination

D_s = 0.368 (Exhibit 13-12)

S_R= 56.5 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 56.5 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Union Valley Parkway On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	AM 2025	Analysis Year	2025

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	1260
Deceleration Lane Length L_D	
Freeway Volume, V_F	2033
Ramp Volume, V_R	966
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2033	0.94	Level	5	2	0.972	1.00	2225
Ramp	966	0.94	Level	5	2	0.972	1.00	1057
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 2225 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3282	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3282	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$$

D_R = 22.7 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.362 (Exibit 13-11)

S_R= 56.7 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 56.7 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Union Valley Parkway On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	PM 2025	Analysis Year	2025

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	1260
Deceleration Lane Length L_D	
Freeway Volume, V_F	2515
Ramp Volume, V_R	751
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2515	0.94	Level	5	2	0.972	1.00	2753
Ramp	751	0.94	Level	5	2	0.972	1.00	822
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 2753 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3575	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3575	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 25.1 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.397 (Exibit 13-11)

S_R= 55.9 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 55.9 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Union Valley Parkway On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	Saturday Existing	Analysis Year	2019

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	1260
Deceleration Lane Length L_D	
Freeway Volume, V_F	1096
Ramp Volume, V_R	277
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1096	0.94	Level	5	2	0.972	1.00	1200
Ramp	277	0.94	Grade	5	2	0.972	1.00	303
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1200 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1503	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1503	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$$

D_R = 9.2 (pc/mi/ln)

LOS = A (Exhibit 13-2)

Speed Determination

M_S = 0.276 (Exibit 13-11)

S_R= 58.7 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 58.7 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Union Valley Parkway Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	AM 2025	Analysis Year	2025

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	1030
Freeway Volume, V_F	2471
Ramp Volume, V_R	675
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2471	0.94	Level	5	0	0.976	1.00	2694
Ramp	675	0.94	Mountainous	2	0	0.935	1.00	768
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 2694 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	2694	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	1926	Exhibit 13-8	4700	No
V_R	768	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2694	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 18.2 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.432 (Exhibit 13-12)

S_R= 55.1 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 55.1 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Union Valley Parkway Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	PM 2025	Analysis Year	2025

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	1030
Freeway Volume, V_F	3212
Ramp Volume, V_R	857
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	3212	0.94	Level	5	0	0.976	1.00	3502
Ramp	857	0.94	Mountainous	2	0	0.935	1.00	976
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 3502 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	3502	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	2526	Exhibit 13-8	4700	No
V_R	976	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3502	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = 25.1 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

D_s = 0.451 (Exhibit 13-12)

S_R= 54.6 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 54.6 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Union Valley Parkway Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	Saturday 2025	Analysis Year	2025

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	1030
Freeway Volume, V_F	1369
Ramp Volume, V_R	520
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1369	0.94	Level	5	0	0.976	1.00	1493
Ramp	520	0.94	Level	2	0	0.990	1.00	559
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 1493 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1493	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	934	Exhibit 13-8	4700	No
V_R	559	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1493	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = 7.8 (pc/mi/ln)

LOS = A (Exhibit 13-2)

Speed Determination

D_s = 0.413 (Exhibit 13-12)

S_R= 55.5 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 55.5 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Union Valley Parkway On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	AM 2025	Analysis Year	2025

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	1360
Deceleration Lane Length L_D	
Freeway Volume, V_F	2471
Ramp Volume, V_R	124
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2471	0.94	Level	5	2	0.972	1.00	2705
Ramp	124	0.94	Grade	5	2	0.972	1.00	136
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 2705 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	2841	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2841	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$$

D_R = 19.0 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.320 (Exibit 13-11)

S_R= 57.6 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 57.6 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Union Valley Parkway On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	PM 2025	Analysis Year	2025

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	1360
Deceleration Lane Length L_D	
Freeway Volume, V_F	3212
Ramp Volume, V_R	67
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	3212	0.94	Level	5	2	0.972	1.00	3516
Ramp	67	0.94	Grade	5	2	0.972	1.00	73
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)
P_{FM} = 1.000 using Equation (Exhibit 13-6)
V_{12} = 3516 pc/h
V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3589	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3589	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$$

D_R = 24.9 (pc/mi/ln)
LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.394 (Exibit 13-11)
S_R= 55.9 mph (Exhibit 13-11)
S_0= N/A mph (Exhibit 13-11)
S = 55.9 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)
P_{FD} = using Equation (Exhibit 13-7)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$$

D_R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)
S_R= mph (Exhibit 13-12)
S_0= mph (Exhibit 13-12)
S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Union Valley Parkway On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	Saturday 2025	Analysis Year	2025

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	1360
Deceleration Lane Length L_D	
Freeway Volume, V_F	1369
Ramp Volume, V_R	24
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1369	0.94	Level	5	2	0.972	1.00	1499
Ramp	24	0.94	Grade	5	2	0.972	1.00	26
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1499 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1525	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1525	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$$

D_R = 8.8 (pc/mi/ln)

LOS = A (Exhibit 13-2)

Speed Determination

M_S = 0.271 (Exibit 13-11)

S_R= 58.8 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 58.8 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Santa Maria Way Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	AM 2025	Analysis Year	2025 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	900
Freeway Volume, V_F	2875
Ramp Volume, V_R	404
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	2875	0.94	Level	5	0	0.976	1.00	3135
Ramp	404	0.94	Level	2	0	0.990	1.00	434
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F\,(P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 3135 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	3135	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	2701	Exhibit 13-8	4700	No
V_R	434	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3135	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = 23.1 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

D_s = 0.402 (Exhibit 13-12)

S_R= 55.8 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 55.8 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Santa Maria Way Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	PM 2025	Analysis Year	2025 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	900
Freeway Volume, V_F	3529
Ramp Volume, V_R	649
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	3529	0.94	Level	5	0	0.976	1.00	3848
Ramp	649	0.94	Level	2	0	0.990	1.00	697
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 3848 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	3848	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	3151	Exhibit 13-8	4700	No
V_R	697	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3848	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = 29.2 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.426 (Exhibit 13-12)

S_R= 55.2 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 55.2 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Santa Maria Way Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	Saturday 2025	Analysis Year	2025 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	900
Freeway Volume, V_F	1690
Ramp Volume, V_R	280
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1690	0.94	Level	5	0	0.976	1.00	1843
Ramp	280	0.94	Level	2	0	0.990	1.00	301
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 1843 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1843	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	1542	Exhibit 13-8	4700	No
V_R	301	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1843	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 12.0 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.390 (Exhibit 13-12)

S_R= 56.0 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 56.0 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Santa Maria Way On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	AM 2025	Analysis Year	2025 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	3
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	750
Deceleration Lane Length L_D	
Freeway Volume, V_F	2875
Ramp Volume, V_R	348
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2875	0.94	Level	5	2	0.972	1.00	3147
Ramp	348	0.94	Grade	5	2	0.972	1.00	381
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.599 using Equation (Exhibit 13-6)

V_{12} = 1883 pc/h

V_3 or V_{av34} 1264 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3528	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2264	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 18.3 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.321 (Exhibit 13-11)

S_R= 57.6 mph (Exhibit 13-11)

S_0= 62.2 mph (Exhibit 13-11)

S = 59.2 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Santa Maria Way On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	PM 2025	Analysis Year	2025 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	3
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	750
Deceleration Lane Length L_D	
Freeway Volume, V_F	3529
Ramp Volume, V_R	448
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	3529	0.94	Level	5	2	0.972	1.00	3863
Ramp	448	0.94	Grade	5	2	0.972	1.00	490
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F\,(P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.599 using Equation (Exhibit 13-6)

V_{12} = 2312 pc/h

V_3 or V_{av34} 1551 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	4353	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2802	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$$

D_R = 22.4 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.348 (Exhibit 13-11)

S_R= 57.0 mph (Exhibit 13-11)

S_0= 61.2 mph (Exhibit 13-11)

S = 58.4 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Santa Maria Way On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	Saturday 2025	Analysis Year	2025 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	3
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	750
Deceleration Lane Length L_D	
Freeway Volume, V_F	1690
Ramp Volume, V_R	127
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1690	0.94	Level	5	2	0.972	1.00	1850
Ramp	127	0.94	Grade	5	2	0.972	1.00	139
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.599 using Equation (Exhibit 13-6)

V_{12} = 1107 pc/h

V_3 or V_{av34} 743 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1989	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1246	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 10.4 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.297 (Exibit 13-11)

S_R= 58.2 mph (Exhibit 13-11)

S_0= 64.1 mph (Exhibit 13-11)

S = 60.3 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Santa Maria Way Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	AM 2025	Analysis Year	2025 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	1500
Freeway Volume, V_F	2875
Ramp Volume, V_R	531
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2875	0.94	Level	5	0	0.976	1.00	3135
Ramp	531	0.94	Level	2	0	0.990	1.00	571
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 3135 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	3135	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	2564	Exhibit 13-8	4700	No
V_R	571	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3135	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 17.7 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.414 (Exhibit 13-12)

S_R= 55.5 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 55.5 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Santa Maria Way Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	PM 2025	Analysis Year	2025 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	1500
Freeway Volume, V_F	3501
Ramp Volume, V_R	529
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	3501	0.94	Level	5	0	0.976	1.00	3818
Ramp	529	0.94	Level	2	0	0.990	1.00	568
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 3818 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	3818	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	3250	Exhibit 13-8	4700	No
V_R	568	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3818	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 23.6 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

D_s = 0.414 (Exhibit 13-12)

S_R= 55.5 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 55.5 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Santa Maria Way Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	Saturday 2025	Analysis Year	2025 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp			Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N	2	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N	1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A		L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D	1500	V_D = veh/h
	Freeway Volume, V_F	1027	
	Ramp Volume, V_R	216	
	Freeway Free-Flow Speed, S_{FF}	65.0	
	Ramp Free-Flow Speed, S_{FR}	40.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1027	0.94	Level	5	0	0.976	1.00	1120
Ramp	216	0.94	Level	2	0	0.990	1.00	232
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 1120 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1120	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	888	Exhibit 13-8	4700	No
V_R	232	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1120	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = 0.4 (pc/mi/ln)

LOS = A (Exhibit 13-2)

Speed Determination

D_s = 0.384 (Exhibit 13-12)

S_R= 56.2 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 56.2 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Santa Maria Way On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	AM 2025	Analysis Year	2025 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	1000
Deceleration Lane Length L_D	
Freeway Volume, V_F	2875
Ramp Volume, V_R	350
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2875	0.94	Level	5	2	0.972	1.00	3147
Ramp	350	0.94	Grade	5	2	0.972	1.00	383
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 3147 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3530	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3530	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$$

D_R = 26.6 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.404 (Exibit 13-11)

S_R= 55.7 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 55.7 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Santa Maria Way On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	PM 2025	Analysis Year	2025 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	1000
Deceleration Lane Length L_D	
Freeway Volume, V_F	3501
Ramp Volume, V_R	547
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	3501	0.94	Level	5	2	0.972	1.00	3832
Ramp	547	0.94	Grade	5	2	0.972	1.00	599
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)
P_{FM} = 1.000 using Equation (Exhibit 13-6)
V_{12} = 3832 pc/h
V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	4431	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4431	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$$

D_R = 33.5 (pc/mi/ln)
LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.599 (Exibit 13-11)
S_R= 51.2 mph (Exhibit 13-11)
S_0= N/A mph (Exhibit 13-11)
S = 51.2 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)
P_{FD} = using Equation (Exhibit 13-7)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$$

D_R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)
S_R= mph (Exhibit 13-12)
S_0= mph (Exhibit 13-12)
S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Santa Maria Way On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	Saturday 2025	Analysis Year	2025 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	1000
Deceleration Lane Length L_D	
Freeway Volume, V_F	1027
Ramp Volume, V_R	286
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1027	0.94	Level	5	2	0.972	1.00	1124
Ramp	286	0.94	Grade	5	2	0.972	1.00	313
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1124 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1437	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1437	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$$

D_R = 10.3 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.287 (Exibit 13-11)

S_R= 58.4 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 58.4 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Union Valley Parkway Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	AM 2025	Analysis Year	2025 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	1340
Freeway Volume, V_F	2031
Ramp Volume, V_R	101
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	2031	0.94	Level	5	0	0.976	1.00	2215
Ramp	101	0.94	Level	2	0	0.990	1.00	109
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 2215 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	2215	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	2106	Exhibit 13-8	4700	No
V_R	109	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2215	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = 11.2 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.373 (Exhibit 13-12)

S_R= 56.4 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 56.4 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Union Valley Parkway Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	PM 2025	Analysis Year	2025 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	1340
Freeway Volume, V_F	2514
Ramp Volume, V_R	124
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2514	0.94	Level	5	0	0.976	1.00	2741
Ramp	124	0.94	Level	2	0	0.990	1.00	133
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 2741 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	2741	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	2608	Exhibit 13-8	4700	No
V_R	133	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2741	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$$

D_R = 15.8 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.375 (Exhibit 13-12)

S_R= 56.4 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 56.4 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Union Valley Parkway Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	Saturday 2025	Analysis Year	2025 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp			Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N	2	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N	1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A		L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D	1340	V_D = veh/h
	Freeway Volume, V_F	1094	
	Ramp Volume, V_R	69	
	Freeway Free-Flow Speed, S_{FF}	65.0	
	Ramp Free-Flow Speed, S_{FR}	40.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1094	0.94	Level	5	0	0.976	1.00	1193
Ramp	69	0.94	Level	2	0	0.990	1.00	74
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 1193 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1193	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	1119	Exhibit 13-8	4700	No
V_R	74	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1193	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = 2.5 (pc/mi/ln)

LOS = A (Exhibit 13-2)

Speed Determination

D_s = 0.370 (Exhibit 13-12)

S_R= 56.5 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 56.5 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Union Valley Parkway On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	AM 2025	Analysis Year	2025 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	1260
Deceleration Lane Length L_D	
Freeway Volume, V_F	2031
Ramp Volume, V_R	966
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2031	0.94	Level	5	2	0.972	1.00	2223
Ramp	966	0.94	Level	5	2	0.972	1.00	1057
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 2223 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3280	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3280	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 22.7 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.362 (Exibit 13-11)

S_R= 56.7 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 56.7 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

HCS2010™ Version 6.41 Generated: 12/16/2019 8:03 AM

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Union Valley Parkway On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	PM 2025	Analysis Year	2025 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	1260
Deceleration Lane Length L_D	
Freeway Volume, V_F	2514
Ramp Volume, V_R	756
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2514	0.94	Level	5	2	0.972	1.00	2752
Ramp	756	0.94	Level	5	2	0.972	1.00	828
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 2752 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3580	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3580	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 25.1 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.398 (Exibit 13-11)

S_R= 55.8 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 55.8 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

 HCS2010™ Version 6.41 Generated: 12/16/2019 8:04 AM

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Union Valley Parkway On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	Saturday 2025	Analysis Year	2025 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	1260
Deceleration Lane Length L_D	
Freeway Volume, V_F	1094
Ramp Volume, V_R	484
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1094	0.94	Level	5	2	0.972	1.00	1198
Ramp	484	0.94	Grade	5	2	0.972	1.00	530
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1198 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1728	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1728	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 10.8 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.280 (Exibit 13-11)

S_R= 58.6 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 58.6 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

 HCS2010™ Version 6.41 Generated: 12/16/2019 8:05 AM

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Union Valley Parkway Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	AM 2025	Analysis Year	2025 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{up} = ft
V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	1030
Freeway Volume, V_F	2467
Ramp Volume, V_R	675
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp
☐ Yes ☐ On
☑ No ☐ Off
L_{down} = ft
V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2467	0.94	Level	5	0	0.976	1.00	2690
Ramp	675	0.94	Mountainous	2	0	0.935	1.00	768
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F\,(P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)
P_{FM} = using Equation (Exhibit 13-6)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☐ No
If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$$

D_R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)
S_R= mph (Exhibit 13-11)
S_0= mph (Exhibit 13-11)
S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)
P_{FD} = 1.000 using Equation (Exhibit 13-7)
V_{12} = 2690 pc/h
V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☑ No
If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	2690	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	1922	Exhibit 13-8	4700	No
V_R	768	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2690	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$$

D_R = 18.1 (pc/mi/ln)
LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.432 (Exhibit 13-12)
S_R= 55.1 mph (Exhibit 13-12)
S_0= N/A mph (Exhibit 13-12)
S = 55.1 mph (Exhibit 13-13)

 HCS2010™ Version 6.41 Generated: 12/16/2019 8:06 AM

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Union Valley Parkway Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	PM 2025	Analysis Year	2025 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	1030
Freeway Volume, V_F	3203
Ramp Volume, V_R	857
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	3203	0.94	Level	5	0	0.976	1.00	3493
Ramp	857	0.94	Mountainous	2	0	0.935	1.00	976
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 3493 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	3493	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	2517	Exhibit 13-8	4700	No
V_R	976	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3493	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$$

D_R = 25.0 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

D_s = 0.451 (Exhibit 13-12)

S_R= 54.6 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 54.6 mph (Exhibit 13-13)

 HCS2010™ Version 6.41 Generated: 12/16/2019 8:06 AM

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Union Valley Parkway Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	Saturday 2025	Analysis Year	2025 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	1030
Freeway Volume, V_F	1132
Ramp Volume, V_R	520
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1132	0.94	Level	5	0	0.976	1.00	1234
Ramp	520	0.94	Level	2	0	0.990	1.00	559
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F\ (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 1234 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1234	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	675	Exhibit 13-8	4700	No
V_R	559	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1234	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 5.6 (pc/mi/ln)

LOS = A (Exhibit 13-2)

Speed Determination

D_s = 0.413 (Exhibit 13-12)

S_R= 55.5 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 55.5 mph (Exhibit 13-13)

 HCS2010[TM] Version 6.41 Generated: 12/16/2019 8:07 AM

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Union Valley Parkway On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	AM 2025	Analysis Year	2025 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	1360
Deceleration Lane Length L_D	
Freeway Volume, V_F	2467
Ramp Volume, V_R	124
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2467	0.94	Level	5	2	0.972	1.00	2701
Ramp	124	0.94	Grade	5	2	0.972	1.00	136
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 2701 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	2837	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2837	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$$

D_R = 19.0 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.320 (Exibit 13-11)

S_R= 57.7 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 57.7 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

HCS2010™ Version 6.41 Generated: 12/16/2019 8:08 AM

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Union Valley Parkway On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	PM 2025	Analysis Year	2025 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	1360
Deceleration Lane Length L_D	
Freeway Volume, V_F	3203
Ramp Volume, V_R	67
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	3203	0.94	Level	5	2	0.972	1.00	3506
Ramp	67	0.94	Grade	5	2	0.972	1.00	73
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 3506 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3579	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3579	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$$

D_R = 24.8 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.393 (Exibit 13-11)

S_R= 56.0 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 56.0 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Union Valley Parkway On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	Saturday 2025	Analysis Year	2025 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	1360
Deceleration Lane Length L_D	
Freeway Volume, V_F	1132
Ramp Volume, V_R	24
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1132	0.94	Level	5	2	0.972	1.00	1239
Ramp	24	0.94	Grade	5	2	0.972	1.00	26
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)
P_{FM} = 1.000 using Equation (Exhibit 13-6)
V_{12} = 1239 pc/h
V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1265	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1265	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 6.8 (pc/mi/ln)
LOS = A (Exhibit 13-2)

Speed Determination

M_S = 0.267 (Exibit 13-11)
S_R= 58.9 mph (Exhibit 13-11)
S_0= N/A mph (Exhibit 13-11)
S = 58.9 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)
P_{FD} = using Equation (Exhibit 13-7)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)
S_R= mph (Exhibit 13-12)
S_0= mph (Exhibit 13-12)
S = mph (Exhibit 13-13)

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Appendix K – HCS Reports – Ramps (2040)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Santa Maria Way Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	AM 2040	Analysis Year	2040

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	900
Freeway Volume, V_F	3157
Ramp Volume, V_R	613
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	3157	0.94	Level	5	0	0.976	1.00	3442
Ramp	613	0.94	Level	2	0	0.990	1.00	659
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F\,(P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 3442 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	3442	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	2783	Exhibit 13-8	4700	No
V_R	659	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3442	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 25.8 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

D_s = 0.422 (Exhibit 13-12)

S_R= 55.3 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 55.3 mph (Exhibit 13-13)

 HCS2010™ Version 6.41 Generated: 12/12/2019 10:18 AM

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Santa Maria Way Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	PM 2040	Analysis Year	2040

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	900
Freeway Volume, V_F	3796
Ramp Volume, V_R	860
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	3796	0.94	Level	5	0	0.976	1.00	4139
Ramp	860	0.94	Level	2	0	0.990	1.00	924
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F\,(P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 4139 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	4139	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	3215	Exhibit 13-8	4700	No
V_R	924	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	4139	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = 31.7 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.446 (Exhibit 13-12)

S_R= 54.7 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 54.7 mph (Exhibit 13-13)

 HCS2010™ Version 6.41 Generated: 12/12/2019 10:21 AM

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Santa Maria Way Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	Saturday 2040	Analysis Year	2040

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	900
Freeway Volume, V_F	1681
Ramp Volume, V_R	450
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1681	0.94	Level	5	0	0.976	1.00	1833
Ramp	450	0.94	Level	2	0	0.990	1.00	484
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 1833 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1833	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	1349	Exhibit 13-8	4700	No
V_R	484	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1833	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = 11.9 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.407 (Exhibit 13-12)

S_R= 55.6 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 55.6 mph (Exhibit 13-13)

 HCS2010™ Version 6.41 Generated: 12/12/2019 10:23 AM

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Santa Maria Way On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	AM 2040	Analysis Year	2040

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	3
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	750
Deceleration Lane Length L_D	
Freeway Volume, V_F	3157
Ramp Volume, V_R	492
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	3157	0.94	Level	5	2	0.972	1.00	3456
Ramp	492	0.94	Grade	5	2	0.972	1.00	539
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.599 using Equation (Exhibit 13-6)

V_{12} = 2068 pc/h

V_3 or V_{av34} 1388 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3995	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2607	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$$

D_R = 20.9 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.336 (Exibit 13-11)

S_R= 57.3 mph (Exhibit 13-11)

S_0= 61.8 mph (Exhibit 13-11)

S = 58.8 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

HCS2010™ Version 6.41 Generated: 12/13/2019 10:45 AM

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Santa Maria Way On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	PM 2040	Analysis Year	2040

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	3
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	750
Deceleration Lane Length L_D	
Freeway Volume, V_F	3796
Ramp Volume, V_R	584
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	3796	0.94	Level	5	2	0.972	1.00	4155
Ramp	584	0.94	Grade	5	2	0.972	1.00	639
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.599 using Equation (Exhibit 13-6)

V_{12} = 2487 pc/h

V_3 or V_{av34} 1668 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	4794	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3126	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$$

D_R = 24.9 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.372 (Exhibit 13-11)

S_R= 56.4 mph (Exhibit 13-11)

S_0= 60.8 mph (Exhibit 13-11)

S = 57.9 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Santa Maria Way On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	Saturday 2040	Analysis Year	2040

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	3
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	750
Deceleration Lane Length L_D	
Freeway Volume, V_F	1681
Ramp Volume, V_R	221
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1681	0.94	Level	5	2	0.972	1.00	1840
Ramp	221	0.94	Grade	5	2	0.972	1.00	242
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.599 using Equation (Exhibit 13-6)

V_{12} = 1101 pc/h

V_3 or V_{av34} 739 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	2082	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1343	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 11.1 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.298 (Exibit 13-11)

S_R= 58.1 mph (Exhibit 13-11)

S_0= 64.1 mph (Exhibit 13-11)

S = 60.1 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Santa Maria Way Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	AM 2040	Analysis Year	2040

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	1500
Freeway Volume, V_F	3050
Ramp Volume, V_R	649
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	3050	0.94	Level	5	0	0.976	1.00	3326
Ramp	649	0.94	Level	2	0	0.990	1.00	697
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F\,(P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 3326 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	3326	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	2629	Exhibit 13-8	4700	No
V_R	697	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3326	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = 19.4 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.426 (Exhibit 13-12)

S_R= 55.2 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 55.2 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Santa Maria Way Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	PM 2040	Analysis Year	2040

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	1500
Freeway Volume, V_F	3686
Ramp Volume, V_R	648
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	3686	0.94	Level	5	0	0.976	1.00	4019
Ramp	648	0.94	Level	2	0	0.990	1.00	696
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 4019 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	4019	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	3323	Exhibit 13-8	4700	No
V_R	696	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	4019	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 25.3 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

D_s = 0.426 (Exhibit 13-12)

S_R= 55.2 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 55.2 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Santa Maria Way Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	Saturday 2040	Analysis Year	2040

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	1500
Freeway Volume, V_F	1149
Ramp Volume, V_R	295
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1149	0.94	Level	5	0	0.976	1.00	1253
Ramp	295	0.94	Level	2	0	0.990	1.00	317
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 1253 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1253	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	936	Exhibit 13-8	4700	No
V_R	317	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1253	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$$

D_R = 1.5 (pc/mi/ln)

LOS = A (Exhibit 13-2)

Speed Determination

D_s = 0.392 (Exhibit 13-12)

S_R= 56.0 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 56.0 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Santa Maria Way On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	AM 2040	Analysis Year	2040

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	1000
Deceleration Lane Length L_D	
Freeway Volume, V_F	3050
Ramp Volume, V_R	406
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	3050	0.94	Level	5	2	0.972	1.00	3339
Ramp	406	0.94	Grade	5	2	0.972	1.00	444
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 3339 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3783	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3783	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$$

D_R = 28.5 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.442 (Exibit 13-11)

S_R= 54.8 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 54.8 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Santa Maria Way On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	PM 2040	Analysis Year	2040

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	1000
Deceleration Lane Length L_D	
Freeway Volume, V_F	3686
Ramp Volume, V_R	616
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	3686	0.94	Level	5	2	0.972	1.00	4035
Ramp	616	0.94	Grade	5	2	0.972	1.00	674
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 4035 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	4709	Exhibit 13-8		Yes

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4709	Exhibit 13-8	4600:All	Yes

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$$

D_R = 35.6 (pc/mi/ln)

LOS = F (Exhibit 13-2)

Speed Determination

M_S = 0.704 (Exibit 13-11)

S_R= 48.8 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 48.8 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Santa Maria Way On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	Saturday 2040	Analysis Year	2040

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	1000
Deceleration Lane Length L_D	
Freeway Volume, V_F	1149
Ramp Volume, V_R	575
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1149	0.94	Level	5	2	0.972	1.00	1258
Ramp	575	0.94	Grade	5	2	0.972	1.00	629
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1258 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1887	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1887	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 13.6 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.297 (Exibit 13-11)

S_R= 58.2 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 58.2 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Union Valley Parkway Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	AM 2040	Analysis Year	2040

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	1340
Freeway Volume, V_F	2240
Ramp Volume, V_R	102
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2240	0.94	Level	5	0	0.976	1.00	2443
Ramp	102	0.94	Level	2	0	0.990	1.00	110
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 2443 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	2443	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	2333	Exhibit 13-8	4700	No
V_R	110	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2443	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$$

D_R = 13.2 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.373 (Exhibit 13-12)

S_R= 56.4 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 56.4 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Union Valley Parkway Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	PM 2040	Analysis Year	2040

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	1340
Freeway Volume, V_F	2732
Ramp Volume, V_R	131
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2732	0.94	Level	5	0	0.976	1.00	2979
Ramp	131	0.94	Level	2	0	0.990	1.00	141
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 2979 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	2979	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	2838	Exhibit 13-8	4700	No
V_R	141	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2979	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = 17.8 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.376 (Exhibit 13-12)

S_R= 56.4 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 56.4 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Union Valley Parkway Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	Saturday 2040	Analysis Year	2040

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	1340
Freeway Volume, V_F	1245
Ramp Volume, V_R	51
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1245	0.94	Level	5	0	0.976	1.00	1358
Ramp	51	0.94	Level	2	0	0.990	1.00	55
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 1358 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1358	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	1303	Exhibit 13-8	4700	No
V_R	55	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1358	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = 3.9 (pc/mi/ln)

LOS = A (Exhibit 13-2)

Speed Determination

D_s = 0.368 (Exhibit 13-12)

S_R= 56.5 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 56.5 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Union Valley Parkway On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	AM 2040	Analysis Year	2040

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	1260
Deceleration Lane Length L_D	
Freeway Volume, V_F	2240
Ramp Volume, V_R	1040
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2240	0.94	Level	5	2	0.972	1.00	2452
Ramp	1040	0.94	Level	5	2	0.972	1.00	1138
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 2452 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3590	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3590	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 25.1 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.399 (Exibit 13-11)

S_R= 55.8 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 55.8 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Union Valley Parkway On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	PM 2040	Analysis Year	2040

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	1260
Deceleration Lane Length L_D	
Freeway Volume, V_F	2732
Ramp Volume, V_R	812
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2732	0.94	Level	5	2	0.972	1.00	2991
Ramp	812	0.94	Level	5	2	0.972	1.00	889
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 2991 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3880	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3880	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$$

D_R = 27.4 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.447 (Exibit 13-11)

S_R= 54.7 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 54.7 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Union Valley Parkway On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	Saturday 2040	Analysis Year	2040

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	1260
Deceleration Lane Length L_D	
Freeway Volume, V_F	1245
Ramp Volume, V_R	305
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1245	0.94	Level	5	2	0.972	1.00	1363
Ramp	305	0.94	Grade	5	2	0.972	1.00	334
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1363 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1697	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1697	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 10.7 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.279 (Exibit 13-11)

S_R= 58.6 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 58.6 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Union Valley Parkway Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	AM 2040	Analysis Year	2040

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	1030
Freeway Volume, V_F	2580
Ramp Volume, V_R	732
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2580	0.94	Level	5	0	0.976	1.00	2813
Ramp	732	0.94	Mountainous	2	0	0.935	1.00	833
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F\,(P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 2813 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	2813	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	1980	Exhibit 13-8	4700	No
V_R	833	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2813	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 19.2 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.438 (Exhibit 13-12)

S_R= 54.9 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 54.9 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Union Valley Parkway Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	PM 2040	Analysis Year	2040

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	1030
Freeway Volume, V_F	3338
Ramp Volume, V_R	923
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	3338	0.94	Level	5	0	0.976	1.00	3640
Ramp	923	0.94	Mountainous	2	0	0.935	1.00	1051
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 3640 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	3640	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	2589	Exhibit 13-8	4700	No
V_R	1051	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3640	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = 26.3 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

D_s = 0.458 (Exhibit 13-12)

S_R= 54.5 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 54.5 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Union Valley Parkway Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	Saturday 2040	Analysis Year	2040

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp			Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N	2	☐ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N	1	☑ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A		L_{down} = ft
V_u = veh/h	Deceleration Lane Length L_D	1030	V_D = veh/h
	Freeway Volume, V_F	1464	
	Ramp Volume, V_R	563	
	Freeway Free-Flow Speed, S_{FF}	65.0	
	Ramp Free-Flow Speed, S_{FR}	40.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1464	0.94	Level	5	0	0.976	1.00	1596
Ramp	563	0.94	Level	2	0	0.990	1.00	605
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 1596 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1596	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	991	Exhibit 13-8	4700	No
V_R	605	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1596	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$$

D_R = 8.7 (pc/mi/ln)

LOS = A (Exhibit 13-2)

Speed Determination

D_s = 0.417 (Exhibit 13-12)

S_R= 55.4 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 55.4 mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Union Valley Parkway On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	AM 2040	Analysis Year	2040

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	1360
Deceleration Lane Length L_D	
Freeway Volume, V_F	2580
Ramp Volume, V_R	131
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2580	0.94	Level	5	2	0.972	1.00	2824
Ramp	131	0.94	Grade	5	2	0.972	1.00	143
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 2824 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	2967	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2967	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 20.0 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.329 (Exibit 13-11)

S_R= 57.4 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 57.4 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Union Valley Parkway On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	PM 2040	Analysis Year	2040

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	1360
Deceleration Lane Length L_D	
Freeway Volume, V_F	3338
Ramp Volume, V_R	71
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	3338	0.94	Level	5	2	0.972	1.00	3654
Ramp	71	0.94	Grade	5	2	0.972	1.00	78
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 3654 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3732	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3732	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 26.0 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.416 (Exibit 13-11)

S_R= 55.4 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 55.4 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Union Valley Parkway On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	Saturday 2040	Analysis Year	2040

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	1360
Deceleration Lane Length L_D	
Freeway Volume, V_F	1464
Ramp Volume, V_R	25
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1464	0.94	Level	5	2	0.972	1.00	1603
Ramp	25	0.94	Grade	5	2	0.972	1.00	27
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1603 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1630	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1630	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$$

D_R = 9.6 (pc/mi/ln)

LOS = A (Exhibit 13-2)

Speed Determination

M_S = 0.273 (Exibit 13-11)

S_R= 58.7 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 58.7 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Santa Maria Way Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	AM 2040	Analysis Year	2040 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	900
Freeway Volume, V_F	3138
Ramp Volume, V_R	589
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	3138	0.94	Level	5	0	0.976	1.00	3422
Ramp	589	0.94	Level	2	0	0.990	1.00	633
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 3422 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	3422	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	2789	Exhibit 13-8	4700	No
V_R	633	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3422	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 25.6 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

D_s = 0.420 (Exhibit 13-12)

S_R= 55.3 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 55.3 mph (Exhibit 13-13)

 HCS2010™ Version 6.41 Generated: 12/13/2019 3:30 PM

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Santa Maria Way Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	PM 2040	Analysis Year	2040 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	900
Freeway Volume, V_F	3785
Ramp Volume, V_R	841
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	3785	0.94	Level	5	0	0.976	1.00	4127
Ramp	841	0.94	Level	2	0	0.990	1.00	904
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)
P_{FM} = using Equation (Exhibit 13-6)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)
S_R= mph (Exhibit 13-11)
S_0= mph (Exhibit 13-11)
S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)
P_{FD} = 1.000 using Equation (Exhibit 13-7)
V_{12} = 4127 pc/h
V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	4127	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	3223	Exhibit 13-8	4700	No
V_R	904	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	4127	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = 31.6 (pc/mi/ln)
LOS = D (Exhibit 13-2)

Speed Determination

D_s = 0.444 (Exhibit 13-12)
S_R= 54.8 mph (Exhibit 13-12)
S_0= N/A mph (Exhibit 13-12)
S = 54.8 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Santa Maria Way Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	Saturday 2040	Analysis Year	2040 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	900
Freeway Volume, V_F	1866
Ramp Volume, V_R	383
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1866	0.94	Level	5	0	0.976	1.00	2035
Ramp	383	0.94	Level	2	0	0.990	1.00	412
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)
P_{FM} = using Equation (Exhibit 13-6)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)
S_R= mph (Exhibit 13-11)
S_0= mph (Exhibit 13-11)
S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)
P_{FD} = 1.000 using Equation (Exhibit 13-7)
V_{12} = 2035 pc/h
V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	2035	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	1623	Exhibit 13-8	4700	No
V_R	412	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2035	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = 13.7 (pc/mi/ln)
LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.400 (Exhibit 13-12)
S_R= 55.8 mph (Exhibit 13-12)
S_0= N/A mph (Exhibit 13-12)
S = 55.8 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Santa Maria Way On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	AM 2040	Analysis Year	2040 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	3
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	750
Deceleration Lane Length L_D	
Freeway Volume, V_F	3138
Ramp Volume, V_R	492
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	3138	0.94	Level	5	2	0.972	1.00	3435
Ramp	492	0.94	Grade	5	2	0.972	1.00	539
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.599 using Equation (Exhibit 13-6)

V_{12} = 2056 pc/h

V_3 or V_{av34} 1379 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3974	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2595	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 20.8 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.336 (Exhibit 13-11)

S_R= 57.3 mph (Exhibit 13-11)

S_0= 61.8 mph (Exhibit 13-11)

S = 58.8 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Santa Maria Way On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	PM 2040	Analysis Year	2040 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	3
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	750
Deceleration Lane Length L_D	
Freeway Volume, V_F	3785
Ramp Volume, V_R	584
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	3785	0.94	Level	5	2	0.972	1.00	4143
Ramp	584	0.94	Grade	5	2	0.972	1.00	639
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F\,(P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.599 using Equation (Exhibit 13-6)

V_{12} = 2480 pc/h

V_3 or V_{av34} 1663 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	4782	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3119	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$$

D_R = 24.8 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.372 (Exhibit 13-11)

S_R= 56.5 mph (Exhibit 13-11)

S_0= 60.8 mph (Exhibit 13-11)

S = 57.9 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Santa Maria Way On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	Saturday 2040	Analysis Year	2040 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	3
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	750
Deceleration Lane Length L_D	
Freeway Volume, V_F	1866
Ramp Volume, V_R	221
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1866	0.94	Level	5	2	0.972	1.00	2043
Ramp	221	0.94	Grade	5	2	0.972	1.00	242
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 0.599 using Equation (Exhibit 13-6)

V_{12} = 1223 pc/h

V_3 or V_{av34} 820 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	2285	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1465	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$$

D_R = 12.1 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.300 (Exibit 13-11)

S_R= 58.1 mph (Exhibit 13-11)

S_0= 63.8 mph (Exhibit 13-11)

S = 60.0 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Santa Maria Way Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	AM 2040	Analysis Year	2040 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	1500
Freeway Volume, V_F	3050
Ramp Volume, V_R	649
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	3050	0.94	Level	5	0	0.976	1.00	3326
Ramp	649	0.94	Level	2	0	0.990	1.00	697
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F\,(P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 3326 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	3326	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	2629	Exhibit 13-8	4700	No
V_R	697	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3326	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 19.4 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.426 (Exhibit 13-12)

S_R= 55.2 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 55.2 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Santa Maria Way Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	PM 2040	Analysis Year	2040 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	1500
Freeway Volume, V_F	3686
Ramp Volume, V_R	648
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	3686	0.94	Level	5	0	0.976	1.00	4019
Ramp	648	0.94	Level	2	0	0.990	1.00	696
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)
P_{FM} = using Equation (Exhibit 13-6)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☐ No
If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)
S_R= mph (Exhibit 13-11)
S_0= mph (Exhibit 13-11)
S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)
P_{FD} = 1.000 using Equation (Exhibit 13-7)
V_{12} = 4019 pc/h
V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☑ No
If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	4019	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	3323	Exhibit 13-8	4700	No
V_R	696	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	4019	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = 25.3 (pc/mi/ln)
LOS = C (Exhibit 13-2)

Speed Determination

D_s = 0.426 (Exhibit 13-12)
S_R= 55.2 mph (Exhibit 13-12)
S_0= N/A mph (Exhibit 13-12)
S = 55.2 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Santa Maria Way Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	Saturday 2040	Analysis Year	2040 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	1500
Freeway Volume, V_F	1149
Ramp Volume, V_R	295
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1149	0.94	Level	5	0	0.976	1.00	1253
Ramp	295	0.94	Level	2	0	0.990	1.00	317
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 1253 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1253	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	936	Exhibit 13-8	4700	No
V_R	317	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1253	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = 1.5 (pc/mi/ln)

LOS = A (Exhibit 13-2)

Speed Determination

D_s = 0.392 (Exhibit 13-12)

S_R= 56.0 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 56.0 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Santa Maria Way On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	AM 2040	Analysis Year	2040 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	1000
Deceleration Lane Length L_D	
Freeway Volume, V_F	3050
Ramp Volume, V_R	384
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	3050	0.94	Level	5	2	0.972	1.00	3339
Ramp	384	0.94	Grade	5	2	0.972	1.00	420
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 3339 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3759	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3759	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$$

D_R = 28.3 (pc/mi/ln)

LOS = D (Exhibit 13-2)

Speed Determination

M_S = 0.438 (Exibit 13-11)

S_R= 54.9 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 54.9 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Santa Maria Way On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	PM 2040	Analysis Year	2040 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	1000
Deceleration Lane Length L_D	
Freeway Volume, V_F	3686
Ramp Volume, V_R	590
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	3686	0.94	Level	5	2	0.972	1.00	4035
Ramp	590	0.94	Grade	5	2	0.972	1.00	646
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 4035 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	4681	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	4681	Exhibit 13-8	4600:All	Yes

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = 35.4 (pc/mi/ln)

LOS = E (Exhibit 13-2)

Speed Determination

M_S = 0.692 (Exibit 13-11)

S_R= 49.1 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 49.1 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Santa Maria Way On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	Saturday 2040	Analysis Year	2040 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	1000
Deceleration Lane Length L_D	
Freeway Volume, V_F	1149
Ramp Volume, V_R	282
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1149	0.94	Level	5	2	0.972	1.00	1258
Ramp	282	0.94	Grade	5	2	0.972	1.00	309
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1258 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1567	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1567	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$$

D_R = 11.3 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.290 (Exibit 13-11)

S_R= 58.3 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 58.3 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Union Valley Parkway Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	AM 2040	Analysis Year	2040 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	1340
Freeway Volume, V_F	2231
Ramp Volume, V_R	117
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2231	0.94	Level	5	0	0.976	1.00	2433
Ramp	117	0.94	Level	2	0	0.990	1.00	126
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F\ (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 2433 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	2433	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	2307	Exhibit 13-8	4700	No
V_R	126	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2433	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 13.1 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.374 (Exhibit 13-12)

S_R= 56.4 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 56.4 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Union Valley Parkway Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	PM 2040	Analysis Year	2040 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	1340
Freeway Volume, V_F	2725
Ramp Volume, V_R	143
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2725	0.94	Level	5	0	0.976	1.00	2971
Ramp	143	0.94	Level	2	0	0.990	1.00	154
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 2971 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	2971	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	2817	Exhibit 13-8	4700	No
V_R	154	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2971	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 17.7 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.377 (Exhibit 13-12)

S_R= 56.3 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 56.3 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Union Valley Parkway Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	Saturday 2040	Analysis Year	2040 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	1340
Freeway Volume, V_F	1238
Ramp Volume, V_R	110
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1238	0.94	Level	5	0	0.976	1.00	1350
Ramp	110	0.94	Level	2	0	0.990	1.00	118
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F\,(P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 1350 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1350	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	1232	Exhibit 13-8	4700	No
V_R	118	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1350	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 3.8 (pc/mi/ln)

LOS = A (Exhibit 13-2)

Speed Determination

D_s = 0.374 (Exhibit 13-12)

S_R= 56.4 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 56.4 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Union Valley Parkway On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	AM 2040	Analysis Year	2040 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	1260
Deceleration Lane Length L_D	
Freeway Volume, V_F	2231
Ramp Volume, V_R	1045
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2231	0.94	Level	5	2	0.972	1.00	2442
Ramp	1045	0.94	Level	5	2	0.972	1.00	1144
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 2442 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3586	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3586	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$$

D_R = 25.0 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.399 (Exibit 13-11)

S_R= 55.8 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 55.8 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Union Valley Parkway On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	PM 2040	Analysis Year	2040 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	1260
Deceleration Lane Length L_D	
Freeway Volume, V_F	2725
Ramp Volume, V_R	821
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2725	0.94	Level	5	2	0.972	1.00	2983
Ramp	821	0.94	Level	5	2	0.972	1.00	899
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F\,(P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 2983 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3882	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3882	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 27.4 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.447 (Exibit 13-11)

S_R= 54.7 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 54.7 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 NB
Agency or Company	Psomas	Junction	Union Valley Parkway On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	Saturday 2040	Analysis Year	2040 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	1260
Deceleration Lane Length L_D	
Freeway Volume, V_F	1238
Ramp Volume, V_R	556
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1238	0.94	Level	5	2	0.972	1.00	1355
Ramp	556	0.94	Grade	5	2	0.972	1.00	609
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1355 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1964	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1964	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 12.6 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.286 (Exibit 13-11)

S_R= 58.4 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 58.4 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Union Valley Parkway Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	AM 2040	Analysis Year	2040 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	1030
Freeway Volume, V_F	2557
Ramp Volume, V_R	732
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	2557	0.94	Level	5	0	0.976	1.00	2788
Ramp	732	0.94	Mountainous	2	0	0.935	1.00	833
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F\,(P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 2788 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	2788	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	1955	Exhibit 13-8	4700	No
V_R	833	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2788	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 19.0 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.438 (Exhibit 13-12)

S_R= 54.9 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 54.9 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Union Valley Parkway Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	PM 2040	Analysis Year	2040 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	1030
Freeway Volume, V_F	3312
Ramp Volume, V_R	923
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	3312	0.94	Level	5	0	0.976	1.00	3611
Ramp	923	0.94	Mountainous	2	0	0.935	1.00	1051
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 3611 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	3611	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	2560	Exhibit 13-8	4700	No
V_R	1051	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	3611	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$$

D_R = 26.0 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

D_s = 0.458 (Exhibit 13-12)

S_R= 54.5 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 54.5 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Union Valley Parkway Off-Ramp
Date Performed	11/21/2019	Jurisdiction	Santa Barbara County
Analysis Time Period	Saturday 2040	Analysis Year	2040 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	1030
Freeway Volume, V_F	1171
Ramp Volume, V_R	563
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1171	0.94	Level	5	0	0.976	1.00	1277
Ramp	563	0.94	Level	2	0	0.990	1.00	605
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F\,(P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\,v_R + 0.0078\,V_{12} - 0.00627\,L_A$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 1277 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1277	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	672	Exhibit 13-8	4700	No
V_R	605	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1277	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\,V_{12} - 0.009\,L_D$$

D_R = 6.0 (pc/mi/ln)

LOS = A (Exhibit 13-2)

Speed Determination

D_s = 0.417 (Exhibit 13-12)

S_R= 55.4 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 55.4 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Union Valley Parkway On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	AM 2040	Analysis Year	2040 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	1360
Deceleration Lane Length L_D	
Freeway Volume, V_F	2557
Ramp Volume, V_R	131
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	2557	0.94	Level	5	2	0.972	1.00	2799
Ramp	131	0.94	Grade	5	2	0.972	1.00	143
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 2799 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	2942	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2942	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = 19.8 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.327 (Exibit 13-11)

S_R= 57.5 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 57.5 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Union Valley Parkway On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	PM 2040	Analysis Year	2040 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	1360
Deceleration Lane Length L_D	
Freeway Volume, V_F	3312
Ramp Volume, V_R	71
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	3312	0.94	Level	5	2	0.972	1.00	3626
Ramp	71	0.94	Grade	5	2	0.972	1.00	78
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 3626 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	3704	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	3704	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 25.8 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.411 (Exibit 13-11)

S_R= 55.5 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 55.5 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	D. Danehy	Freeway/Dir of Travel	US 101 SB
Agency or Company	Psomas	Junction	Union Valley Parkway On-Ramp
Date Performed	11/21/19	Jurisdiction	Santa Barbara County
Analysis Time Period	Saturday 2040	Analysis Year	2040 + Project

Project Description Orcutt Community Plan Amendment

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	1360
Deceleration Lane Length L_D	
Freeway Volume, V_F	1171
Ramp Volume, V_R	25
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	25.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{down} = ft; V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1171	0.94	Level	5	2	0.972	1.00	1282
Ramp	25	0.94	Grade	5	2	0.972	1.00	27
UpStream								
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)
P_{FM} = 1.000 using Equation (Exhibit 13-6)
V_{12} = 1282 pc/h
V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No
If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1309	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1309	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$$

D_R = 7.1 (pc/mi/ln)
LOS = A (Exhibit 13-2)

Speed Determination

M_S = 0.267 (Exibit 13-11)
S_R= 58.8 mph (Exhibit 13-11)
S_0= N/A mph (Exhibit 13-11)
S = 58.8 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)
P_{FD} = using Equation (Exhibit 13-7)
V_{12} = pc/h
V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)
Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No
Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No
If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$$

D_R = (pc/mi/ln)
LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)
S_R= mph (Exhibit 13-12)
S_0= mph (Exhibit 13-12)
S = mph (Exhibit 13-13)

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Attachment 8

Public Review Period Comment Letters

Attachment 8

Public Review Period Comment Letters

California
Department of Conservation
Geologic Energy Management Division

Gavin Newsom, Governor
David Shabazian, Director
801 K Street, MS 18-05
Sacramento, CA 95814
T: (916) 445-9686

06/28/2020

County: Santa Barbara - Planning & Development
Mark Friedlander
123 East Anapamu Street, Santa Barbara, CA 93101, USA

Construction Site Well Review (CSWR) ID: 1011950

Assessor Parcel Number(s): 107240005, 107240008, 107240027, 107240043, 107240044

Property Owner(s): County of Santa Barbara

Project Location Address: Highway 101 and Union Valley Parkway, Santa Maria, California, 93454

Project Title: SCH # 2020050541, Draft Mitigated Negative Declaration, Orcutt Community Plan Amendment

Public Resources Code (PRC) § 3208.1 establishes well reabandonment responsibility when a previously plugged and abandoned well will be impacted by planned property development or construction activities. Local permitting agencies, property owners, and/or developers should be aware of, and fully understand, that significant and potentially dangerous issues may be associated with development near oil, gas, and geothermal wells.

The Division of Oil, Gas, and Geothermal Resources (Division) has received and reviewed the above referenced project dated 6/26/2020. To assist local permitting agencies, property owners, and developers in making wise land use decisions regarding potential development near oil, gas, or geothermal wells, the Division provides the following well evaluation.

The project is located in Santa Barbara County, within the boundaries of the following fields:

Santa Maria Valley

The Division recommends that the well within the property be researched and located to ensure that any construction does not impede access. Please submit to the Division district office a plot plan identifying the well location relative to the proposed development prior to conducting construction.

Our records indicate there are 1 known oil or gas wells located within the project boundary as identified in the application.

- Number of wells Not Abandoned to Current Division Requirements as Prescribed by Law and Projected to Be Built Over or Have Future Access Impeded by this project: 0
- Number of wells Not Abandoned to Current Division Requirements as Prescribed by Law and Not Projected to Be Built Over or Have Future Access Impeded by this project: 1
- Number of wells Abandoned to Current Division Requirements as Prescribed by Law and Projected to Be Built Over or Have Future Access Impeded by this project: 0

Gavin Newsom, Governor
David Shabazian, Director
801 K Street, MS 18-05
Sacramento, CA 95814
T: (916) 445-9686

- Number of wells Abandoned to Current Division Requirements as Prescribed by Law and Not Projected to Be Built Over or Have Future Access Impeded by this project: 0

The Division categorically advices against building over, or in any way impeding access to, oil, gas, or geothermal wells. Impeding access to a well could result in the need to remove any structure or obstacle that prevents or impedes access including, but not limited to, buildings, housing, fencing, landscaping, trees, pools, patios, sidewalks, roadways, and decking. Maintaining sufficient access is considered the ability for a well servicing unit and associated necessary equipment to reach a well from a public street or access way, solely over the parcel on which the well is located. A well servicing unit, and any necessary equipment, should be able to pass unimpeded along and over the route, and should be able to access the well without disturbing the integrity of surrounding infrastructure.

There are no guarantees a well abandoned in compliance with current Division requirements as prescribed by law will not start leaking in the future. It always remains a possibility that any well may start to leak oil, gas, and/or water after abandonment, no matter how thoroughly the well was plugged and abandoned. The Division acknowledges wells plugged and abandoned to the most current Division requirements as prescribed by law have a lower probability of leaking in the future, however there is no guarantees that such abandonments will not leak.

The Division advises that all wells identified on the development parcel prior to, or during, development activities be tested for liquid and gas leakage. Surveyed locations should be provided to the Division in Latitude and Longitude, NAD 83 decimal format. The Division expects any wells found leaking to be reported to it immediately.

Failure to plug and reabandon the well may result in enforcement action, including an order to perform reabandonment well work, pursuant to PRC § 3208.1, and 3224.

PRC § 3208.1 give the Division the authority to order or permit the re-abandonment of any well where it has reason to question the integrity of the previous abandonment, or if the well is not accessible or visible. Responsibility for re-abandonment costs may be affected by the choices made by the local permitting agency, property owner, and/or developer in considering the general advice set forth in this letter. The PRC continues to define the person or entity responsible for reabandonment as:

1. The property owner - If the well was plugged and abandoned in conformance with Division requirements at the time of abandonment, and in its current condition does not pose an immediate danger to life, health, and property, but requires additional work solely because the owner of the property on which the well is located proposes construction on the property that would prevent or impede access to the well for purposes of remedying a currently perceived future problem, then the owner of the property on which the well is located shall obtain all rights necessary to reabandon the well and be responsible for the reabandonment.

2. The person or entity causing construction over or near the well - If the well was

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plugged and abandoned in conformance with Division requirements at the time of plugging and abandonment, and the property owner, developer, or local agency permitting the construction failed either to obtain an opinion from the supervisor or district deputy as to whether the previously abandoned well is required to be reabandoned, or to follow the advice of the supervisor or district deputy not to undertake the construction, then the person or entity causing the construction over or near the well shall obtain all rights necessary to reabandon the well and be responsible for the reabandonment.

3. The party or parties responsible for disturbing the integrity of the abandonment - If the well was plugged and abandoned in conformance with Division requirements at the time of plugging and abandonment, and after that time someone other than the operator or an affiliate of the operator disturbed the integrity of the abandonment in the course of developing the property, then the party or parties responsible for disturbing the integrity of the abandonment shall be responsible for the reabandonment.

No well work may be performed on any oil, gas, or geothermal well without written approval from the Division. Well work requiring approval includes, but is not limited to, mitigating leaking gas or other fluids from abandoned wells, modifications to well casings, and/or any other re-abandonment work. The Division also regulates the top of a plugged and abandoned well's minimum and maximum depth below final grade. CCR §1723.5 states well casings shall be cut off at least 5 feet but no more than 10 feet below grade. If any well needs to be lowered or raised (i.e. casing cut down or casing riser added) to meet this regulation, a permit from the Division is required before work can start.

The Division makes the following additional recommendations to the local permitting agency, property owner, and developer:

1. To ensure that present and future property owners are aware of (a) the existence of all wells located on the property, and (b) potentially significant issues associated with any improvements near oil or gas wells, the Division recommends that information regarding the above identified well(s), and any other pertinent information obtained after the issuance of this letter, be communicated to the appropriate county recorder for inclusion in the title information of the subject real property.

2. The Division recommends that any soil containing hydrocarbons be disposed of in accordance with local, state, and federal laws. Please notify the appropriate authorities if soil containing significant amounts of hydrocarbons is discovered during development.

As indicated in PRC § 3106, the Division has statutory authority over the drilling, operation, maintenance, and abandonment of oil, gas, and geothermal wells, and attendant facilities, to prevent, as far as possible, damage to life, health, property, and natural resources; damage to underground oil,

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gas, and geothermal deposits; and damage to underground and surface waters suitable for irrigation or domestic purposes. In addition to the Division's authority to order work on wells pursuant to PRC §§ 3208.1 and 3224, it has authority to issue civil and criminal penalties under PRC §§ 3236, 3236.5, and 3359 for violations within the Division's jurisdictional authority. The Division does not regulate grading, excavations, or other land use issues.

If during development activities, any wells are encountered that were not part of this review, the property owner is expected to immediately notify the Division's construction site well review engineer in the Coastal district office, and file for Division review an amended site plan with well casing diagrams. The District office will send a follow-up well evaluation letter to the property owner and local permitting agency.

Should you have any questions, please contact me at (805) 465-9642 or via email at Pat.Abel@conservation.ca.gov

Sincerely,

Pat Abel

Pat Abel
Coastal District Deputy

California
Department of Conservation
Geologic Energy Management Division

Gavin Newsom, Governor
David Shabazian, Director
801 K Street, MS 18-05
Sacramento, CA 95814
T: (916) 445-9686

Wells Not Abandoned to Current Division Requirements as Prescribed by Law & Not Projected to be Built Over or Have Future Access Impeded

The wells listed below are not abandoned to current Division requirements as prescribed by law, and based upon information provided, are not projected to be built over or have future access impeded.

API	Well Designation	Operator	Well Evaluations
0408304455	Core Hole Preisker 1	The Hall-Baker Company, Ltd.	1. Surface plug is absent (CCR § 1723.5).

DEPARTMENT OF TRANSPORTATION
CALTRANS DISTRICT 5
50 HIGUERA STREET
SAN LUIS OBISPO, CA 93401-5415
PHONE (805) 549-3101
FAX (805) 549-3329
TTY 711
www.dot.ca.gov/dist05/

Making Conservation a California Way of Life.

June 29, 2020

SB-101-83.5
19NGD-00000-00013

Mark Friedlander
County of Santa Barbara
Planning & Development
123 E. Anapamu Street
Santa Barbara, CA 93101

COMMENTS FOR THE DRAFT MITIGATED NEGATIVE DECLARATION FOR THE ORCUTT COMMUNITY PLAN AMENDMENT PROJECT

Dear Mr. Friedlander:

The California Department of Transportation (Caltrans) thanks you for the opportunity to review the Draft Mitigated Negative Declaration (MND) for the Orcutt Community Plan Amendment Project and offers the following comments at this time.

General Comments

The project proposes to amend the Orcutt Community Plan (OCP) Key Site 33, by processing a General Plan Amendment (GPA) to include a new local road connection between Union Valley Parkway (UVP) at the Highway (HWY) 101 interchange and the adjoining frontage road known as Rodeo Drive. The approval of the GPA and the Final MND will not result in any physical development or construction activities. Caltrans previously commented on the proposed conceptual project in a letter dated January 10, 2020, some comments in that letter continue to stand, see attached.

Caltrans supports local planning efforts that are consistent with State planning priorities intended to promote equity, strengthen the economy, protect the environment, and promote public health and safety. We accomplish this by working with local jurisdictions to achieve a shared vision of how the transportation system should and can accommodate interregional and local travel.

Projects that support smart growth principles which include improvements to pedestrian, bicycle, and transit infrastructure (or other key Transportation Demand Strategies) are supported by Caltrans and are consistent with our mission, vision, and goals. Since the potential development of a new local road could be a Vehicle Miles Traveled (VMT) inducing project, the application of VMT mitigation measures should be included with the project and the developed purpose and need.

Specific Comments

The following comments are for your information and does not imply conceptual approval by Caltrans to make a new road connection to UVP.

Section 1.4 of the project MND outlines the next steps toward implementation of a future east side connection to Rodeo Drive from the termination of UVP. If allowed, the proposed planned connection should align to UVP and avoid Hwy 101 and the drainage basin. Any future projects should maintain existing drainage patterns and not increase flow toward Hwy 101.

If Caltrans concurs that the access denial line can be altered, there is direction which provides the oversite process, documentation, and California Transpiration Commission (CTC) concurrence, that will need to be adhered to. Please include an additional bullet to Section 1.4, referencing Chapter 27 of the Caltrans' Project Development Procedures Manual which details the process for approval of a new connection to the Hwy 101 freeway. An extension of UVP to connect a local road east of Hwy 101 is considered a new connection to the freeway. Please coordinate with Encroachment Permits regarding the new Project Delivery Quality Management Assessment Process (QMAP).

Further, environmental documentation would be prepared along with the Project Report. The Project Initiation Document (PID) provides conceptual approval and scope of the project. The PID would be a Project Study Report-Project Development Support. Additionally, a Freeway Agreement is in place and will need a revision or amendment.

We look forward to continued coordination with the County on this project. If you have any questions, or need further clarification on items discussed above, please contact me at (805) 835-6555 or ingrid.mcroberts@dot.ca.gov.

Sincerely,

Ingrid McRoberts

Ingrid McRoberts
Development Review Coordinator
District 5, LD-IGR South Branch

Attachment

cc: Michael Becker, SBCAG

DEPARTMENT OF TRANSPORTATION
CALTRANS DISTRICT 5
50 HIGUERA STREET
SAN LUIS OBISPO, CA 93401-5415
PHONE (805) 549-3101
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TTY 711
www.dot.ca.gov/dist05/

Making Conservation a California Way of Life.

January 10, 2020 SB-101-83.5

Mark Friedlander
County of Santa Barbara
Planning & Development
123 E. Anapamu Street
Santa Barbara, CA 93101

COMMENTS FOR THE DRAFT TRAFFIC STUDY AND DRAFT CONCEPTUAL DESIGN FOR THE ORCUTT COMMUNITY PLAN AMENDMENT PROJECT

Dear Mr. Friedlander:

The California Department of Transportation (Caltrans) thanks you for the opportunity to review the Draft Traffic Study and Draft Conceptual Design Drawings for the Orcutt Community Plan Amendment Project and offers the following comments at this time.

General Comments

Caltrans supports local planning efforts that are consistent with State planning priorities intended to promote equity, strengthen the economy, protect the environment, and promote public health and safety. We accomplish this by working with local jurisdictions to achieve a shared vision of how the transportation system should and can accommodate interregional and local travel.

Projects that support smart growth principles which include improvements to pedestrian, bicycle, and transit infrastructure (or other key Transportation Demand Strategies) are supported by Caltrans and are consistent with our mission, vision, and goals.

Please be aware that if any work is completed in the State's right-of-way it will require an encroachment permit from Caltrans and must be done to our engineering and environmental standards, and at no cost to the State. The conditions of approval and the requirements for the encroachment permit are issued at the sole discretion of the Permits Office, and nothing in this letter shall be implied as limiting those future conditioned and requirements. For more information regarding the encroachment permit process, please visit our Encroachment Permit Website at: https://dot.ca.gov/caltrans-near-me/district-5/district-5-programs/d5-encroachment-permits

Specific Comments

Comment 1

There are currently access denial restrictions on the US 101/Union Valley Parkway (UVP) interchange that was acquired at significant cost to the State. If the project proposes to construct Rodeo Drive as described in the December 2019 Draft Traffic Impact Study (TIS) with a new connection to US 101 at UVP, the new connection must be approved by Caltrans and the California Transportation Commission. It should be noted that at this time it has not been demonstrated to us the benefit of allowing this connection concept. Approving a new connection is a lengthy and costly process including a study that demonstrates that the adjacent interchanges cannot satisfactorily accommodate, or be modified to accommodate, the traffic identified in the proposed project. In addition, there are at times obligations to reimburse the State the current and developable value of the access when denial lines are removed.

An analysis of the Santa Maria Way Interchange, at a minimum, must be performed to include the anticipated project traffic demand. It could even be foreseeable that improvements to mainline US 101 would be an element of the proposed connection. Requirements for a new connection to an access-controlled highway can be found in the Caltrans Project Development Procedures Manual, Chapter 27 (PDPM) on the Caltrans website at https://dot.ca.gov/programs/design/manual-project-development-procedures-manual-pdpm.

Comment 2

Once a conceptual alternative is selected, any intersection improvement within the State Highway System (SHS) will require an Intersection Control Evaluation (ICE) to be conducted to determine what the appropriate intersection control will be. The ICE will need to evaluate stop control, signalization, and a roundabout alternative. This is required per Caltrans Traffic Operations Policy Directive 13-02 and Section 4C.01 of the 2014 California Manual on Uniform Traffic Control Devices (MUTCD) which reads in part:

Section 4C.01 Studies and Factors for Justifying Traffic Control Signals

Standard:

01 - An engineering study of traffic conditions, pedestrian characteristics, and physical characteristics of the location shall be performed to determine whether installation of a traffic control signal is justified at a particular location.

01a - On State highways, the engineering study shall include consideration of a roundabout (yield control). If a roundabout is determined to provide a viable and practical solution, it shall be studied in lieu of, or in addition to a traffic control signal.

Guidance:

01b - On local streets and highways, the engineering study should include consideration of a roundabout (yield control). If a roundabout is determined to provide a viable and practical solution, it should be studied in lieu of, or in addition to a traffic control signal.

Support:

01c - Refer to Caltrans' website (http://www.dot.ca.gov/hq/traffops/liaisons/ice.html) for more information on the Traffic Operations Policy Directive 13-02, Intersection Control Evaluation (ICE), and other resources for the evaluation of intersection traffic control strategies.

We look forward to continued coordination with the County on this project. If you have any questions, or need further clarification on items discussed above, please contact me at (805) 549-3131 or ingrid.mcroberts@dot.ca.gov.

Sincerely,

Ingrid McRoberts

Ingrid McRoberts
Development Review Coordinator
District 5, LD-IGR South Branch

cc: SBCAG

June 23, 2020

Mark Friedlander
Santa Barbara County
Planning and Development
123 E. Anapamu Street
Santa Barbara, CA 93101

Re: Santa Barbara County Air Pollution Control District Comments on the Orcutt Community Plan Amendment Project, 19NGD-00000-00013

Dear Mark Friedlander:

The Santa Barbara County Air Pollution Control District (District) has reviewed the Draft Mitigated Negative Declaration (MND) for the referenced project, which consists of an amendment to the Orcutt Community Plan to include a new local road connection between the Union Valley Parkway/U.S Highway 101 interchange and the adjoining frontage road. Project excavation would require the export of approximately 42,000 cubic yards of soil which would require approximately 5,250 one-way haul truck trips over five months. The subject property, a 73.6-acre parcel zoned Agricultural and Highway Commercial and identified in the Assessor Parcel Map Book as APNs 107-240-005, -008 -027, -043, and -044, is located between the U.S. Highway 101/Union Valley Parkway and U.S. Highway 101/Santa Maria Way interchanges in the community of Orcutt.

District staff offers the following comment on the Draft MND:

- **Section 4.3a Air Quality, County Environmental Thresholds, Page 22**: Please update the analysis to reflect that the operational criteria pollutant threshold for all project sources (mobile, stationary, and area sources) adopted by the County is currently 55 pounds per day for NOx or ROC, and 80 pounds per day for PM_{10}.

If you or the project applicant have any questions regarding this comment, please feel free to contact me at (805) 961-8878 or via email at WaddingtonE@sbcapcd.org.

Sincerely,

Emily Waddington

Emily Waddington
Air Quality Specialist
Planning Division

cc: Planning Chron File

Melissa Whittemore

From:	Friedlander, Mark <mfriedlander@co.santa-barbara.ca.us>
Sent:	Tuesday, June 2, 2020 1:17 PM
To:	Melissa Whittemore; Richard Daulton
Cc:	Bell, Allen
Subject:	[EXT] FW: Orcutt Community Plan Amendment - Draft Initial Study-Mitigated Negative Declaration
Follow Up Flag:	Follow up
Flag Status:	Flagged

Hi Melissa,

FYI – Freddie Romero with the SYBCI contacted the County about the Draft IS-MND. Allen and I have a call scheduled for tomorrow morning. We'll keep you updated on our discussion.

Thanks,
Mark

From: Freddie Romero <freddyromero1959@yahoo.com>
Sent: Thursday, May 28, 2020 5:20 PM
To: Friedlander, Mark <mfriedlander@co.santa-barbara.ca.us>
Subject: Re: Orcutt Community Plan Amendment - Draft Initial Study-Mitigated Negative Declaration

Mr. Friedlander,

SYBCI Elders Council would like to talk about the possible impacts to undiscovered/unrecorded cultural/heritage sites that maybe in the APE.

If you would please contact me to discuss these concerns, it would be most appreciated.

Freddie Romero
Cultural Resources Coordinator
SYBCI Elders Council
805-688-7997 X4109
805-403-2873

The information contained in this message may be privileged and confidential and protected from disclosure. If the reader of this message is not the intended recipient, or an employee or agent responsible for delivering this message to the intended recipient, you are hereby notified that any dissemination, distribution, or copying of this communication is strictly prohibited. If you have received this communication in error, please notify us immediately by replying to the message and deleting it from your computer

On Thursday, May 28, 2020, 04:20:49 PM PDT, Friedlander, Mark <mfriedlander@co.santa-barbara.ca.us> wrote:

Hello,

Thank you for your interest in the Orcutt Community Plan Amendment (Case Number 18GPA-00000-00001), which proposes an amendment to include a new local road connection between the Union Valley Parkway/U.S Highway 101 interchange and the adjoining frontage road (commonly referred to as Rodeo Drive) on the east side of U.S. Highway 101. The Draft Initial Study-Mitigated Negative Declaration (Case Number 19NGD-00000-00013), Traffic Impact Study, Conceptual Design Drawing, and related documents are now available on the County Planning and Development website: http://www.countyofsb.org/plndev/projects/uvp.sbc. The public comment period ends on June 29, 2020, at 5:00 p.m. Please submit written comments to me via mail (see address below) or email: mfriedlander@countyofsb.org.

Please contact me if you have trouble accessing the Draft Initial Study-Mitigated Negative Declaration and related documents, or if you need any additional information.

Thanks,

Mark Friedlander

Planner III

Planning & Development

Long Range Planning Division

123 E. Anapamu St.

Santa Barbara, CA 93101

805-568-3532

http://www.countyofsb.org/plndev/home.sbc

Melissa Whittemore

From: Friedlander, Mark <mfriedlander@co.santa-barbara.ca.us>
Sent: Wednesday, June 3, 2020 1:53 PM
To: Melissa Whittemore
Cc: Richard Daulton; Bell, Allen
Subject: [EXT] FW: Orcutt Community Plan Amendment
Attachments: Email Notification List.doc

CAUTION: This email originated from outside of Rincon Consultants. Be cautious before clicking on any links, or opening any attachments, until you are confident that the content is safe .

Hi Melissa,

Thanks for the call. Our discussion with Freddie went well. He had no immediate concerns with our project. His written response is copied below. I've also attached the list of people who were BBC'd to my email notification about the release of the Draft IS-MND.

Mark

From: Freddie Romero <freddyromero1959@yahoo.com>
Sent: Wednesday, June 3, 2020 10:11 AM
To: Friedlander, Mark <mfriedlander@co.santa-barbara.ca.us>; Bell, Allen <abell@co.santa-barbara.ca.us>
Subject: Orcutt Community Plan Amendment

Caution: This email originated from a source outside of the County of Santa Barbara. Do not click links or open attachments unless you verify the sender and know the content is safe.

Mark, Allen,

SYBCI Elders Council would like to thank you for the opportunity to have a conversation today on this proposed GPA and to receive clarification of the process.

The SYBCI Elders Council, after conversing on this amendment, feel comfortable with this GPA going forward for approval as proposed and understand that this project is still early in it's conception and that SYBCI Elders Council will have plenty of opportunity in the future to consult on this project and to express our concerns, as well as make known our requests for the protection of our interest as it relates to those concerns.

Again, the SYBCI Elders Council would like to thank you for this opportunity to express our concerns and acquire the necessary information and to make informed comments on this GPA. If you need any further assistance or need additional information, please contact me at the info below. Thank you

Freddie Romero
Cultural Resources Coordinator
SYBCI Elders Council

805-688-7997 X4109
805-403-2873

URBAN PLANNING CONCEPTS, INC.
URBAN DESIGN • LAND PLANNING • ENVIRONMENTAL ANALYSIS

June 29, 2020

Mark Friedlander Planner
Long Range Planning Division
County of Santa Barbara
123 East Anapamu Street
Santa Barbara, Ca 93101

RE: Union Valley Parkway Extension
Orcutt Community Plan Amendment
Comments on Draft Initial Study Mitigated Negative Declaration

Dear Mark

Thank you for the work on this Draft Initial Study-Mitigated Negative Declaration (MND) for the Union Valley Parkway Extension. The document covered this extension well. Here are our comments and edits.

Page	Para	Comments
Page 1	Para 3	Throughout the document there is reference to Secondary 1 (Class S-1) but also references were made to Collector Road. there should be a reference to what these two different classifications mean.
	Para 4	This paragraph should also mention the new school site and other buildings along Rodeo Drive. Also, this road and future connection will provide access to the surrounding farmland and the farm employee access to these fields.
Page 2	Para 1	Please provide an exhibit of this project description. The exhibit in the appendix needs to be revised per the attached marked up exhibit.
	Para 2	The Elks Rodeo site has also been used as a staging area for the US Forest Service and local Fire Departments during major fires in the region.

		This section should also include details on the new school site, other existing commercial buildings, and the farm access road and easement to the fields to the south. Jantz property Parcel Map 13,290: The description should also describe the Jantz property. In the early 1980's the Jantz family divided this 35-acre property into three lots for future home sites. The development of this site included: • Morningside Drive (Private drive) with Gate • Underground utilities in Morningside Drive • Private Shared Water System • New water well (with two other test wells) • Well Pump 30 HP pump • A 30,000gallon underground cistern • Pepper trees along both sides of Morningside Drive No homes were ever built but the site improvements still exist. In 2010, CalTrans acquired approximately 10 acres from the Jantz to build the UVP interchange and retention basins. This project also included relocating the access easement to the farming operation to the south and CalTrans paved this access road. The Jantz property has two parcel and a remainder parcel left. The future UVP extension will impact this property by taking estimated ???? acres. There maybe an abandoned Phillips 66 pipeline along the east property based on historic records. This is where the **pink chart** should be added to the project description with the APN. Existing acreage and proposed take and resulting net acreage.
Page 5	Figure 3 **New figure**	This exhibit should show the public road segment of Rodeo Drive and then the private road for Morningside Drive and then the 20-foot easement for the farm road to the south. This exhibit should also clearly indicate parcel lines with APN's and ownerships of all the parcels in this study area. The Orcutt Community Plan Amendment figure was placed as an attachment, but it should be located right after Figure 3. This is

		the figure that clearly shows what is being proposed for this project. The design criteria and the road width should be a separate exhibit so that it is easier to read. Lastly and most important the pink color on this exhibit is illustrates a very large “take” beyond what is needed for right-of -way and construction. This should be revised to show what is need for the extension and nothing more. Please revise this exhibit. Also make clear is this right of way take in fee or in easement for the future extension.
Page 6	Para 2 **New figure**	This paragraph should include the OCP Key Site 33 exhibit, so it is clear to all what this KS 33 includes. See the attached Figure KS33-1 to include in the project description section.
Page 7	Add	In this section you should add another topic. All the utilities serving this side of the freeway …Golden State Water, Laguna county Sanitation District, PGE, Gas, cable, telephone
	Para 2	Add school, other buildings, farm employee access road to this paragraph.
Page 12	Para 4	Add the other uses on this side of the freeway including school and other buildings.
Page 32	existing setting	This section should add a better summary of the existing development including the new school site, existing buildings, and the improvements that the Jantz made to their property. There should be a table detailing all the uses in the study area by percentage.
Page 34	Para 1	The basins referenced in this paragraph were built by CalTrans in 2010 as part of the construction of the Union Valley Parkway interchange please note this here.
Page 36 Page 37	Para 2 Para 3	These are CalTrans basins built in 2010 and maintained by the state. Please make that clear in this section.
Page 50	Para 1	Change Southern California Edison to PG&E as the provider of electricity in this region.
Page 50	Energy	This section does not talk about electrical energy serving this side of the freeway and that the new county public road will

		include streetlights as required by the county. The UVP interchange already has lighting and electrical service and so does sections of Rodeo Drive.
Page 52	Para-2	This section should also note that the Elks facilities has been used and will continue to be available for US Forest Service staging on major forest fires. This secondary access to UVP will be a major help in the access to this staging area as big rigs deliver materials to fight fires.
Page 62	Para 1	Include school site and existing commercial buildings as existing uses, too.
Page 70-72	Timing	Throughout this section there are various timing listed for construction 8:00 to 5:00 ..8:00 to 4:00 …and 7:00 to 4:00. We suggest NM N-01 state 7:00 to 5:00 because there is no sensitive receptors in this area.
Page 78	Para 8	This connection will provide an alternative route to access the east side of the freeway to the Elks Rodeo facility and the school site. Add this sentence in this section.
Page 82	Para 1	Please note that the basins were constructed by Caltrans as part of the UVP interchange project and are owned and maintained by the state.

Please include these comments add exhibits in the document. I am available to meet with you to go over these items.

Sincerely

Laurie Tamura

Laurie Tamura, AICP
Principal Planner

Figure KS33
Orcutt Community Plan Amendment

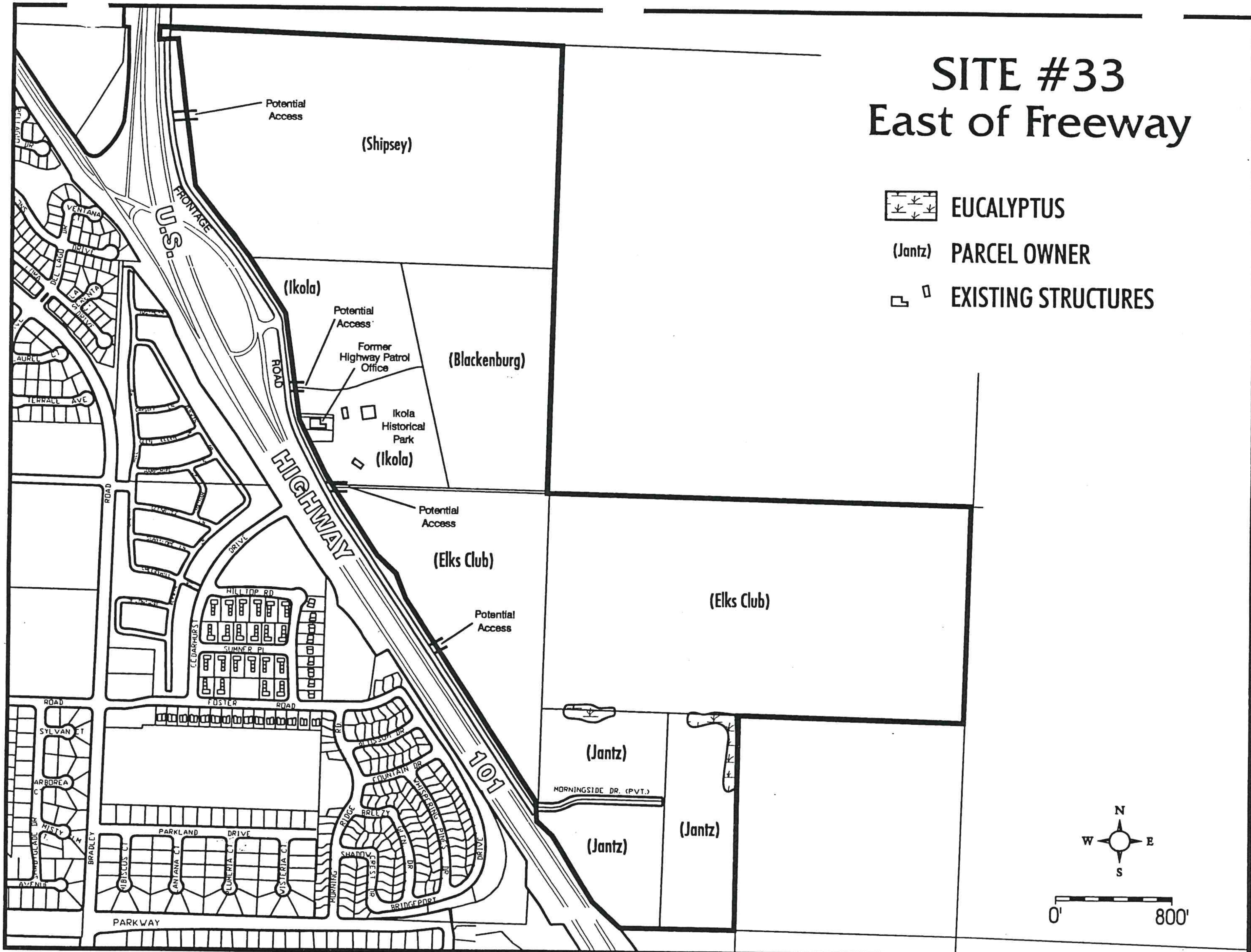
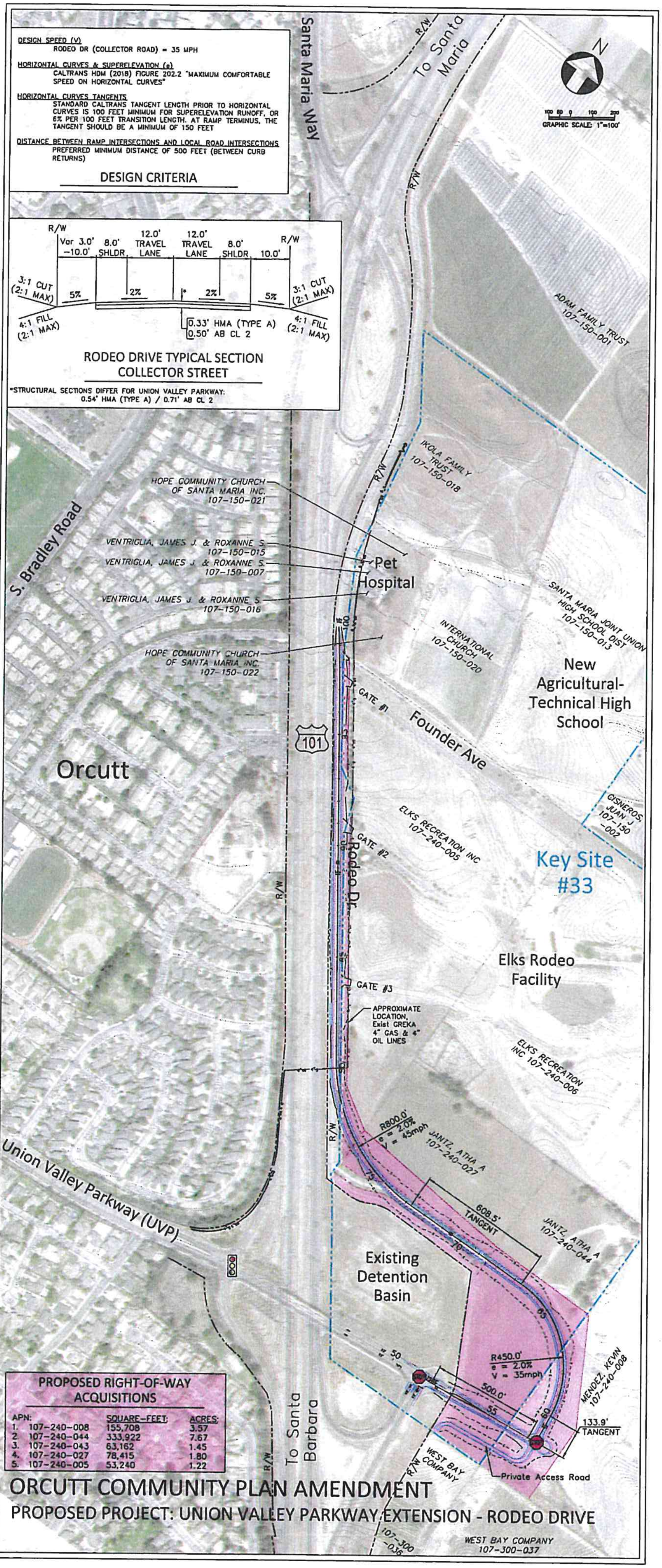


Figure KS33-1

December 11, 1995



DESIGN SPEED (V)
RODEO DR (COLLECTOR ROAD) = 35 MPH

HORIZONTAL CURVES & SUPERELEVATION (e)
CALTRANS HDM (2018) FIGURE 202.2 "MAXIMUM COMFORTABLE SPEED ON HORIZONTAL CURVES"

HORIZONTAL CURVES TANGENTS
STANDARD CALTRANS TANGENT LENGTH PRIOR TO HORIZONTAL CURVES IS 100 FEET MINIMUM FOR SUPERELEVATION RUNOFF, OR 6% PER 100 FEET TRANSITION LENGTH. AT RAMP TERMINUS, THE TANGENT SHOULD BE A MINIMUM OF 150 FEET

DISTANCE BETWEEN RAMP INTERSECTIONS AND LOCAL ROAD INTERSECTIONS
PREFERRED MINIMUM DISTANCE OF 500 FEET (BETWEEN CURB RETURNS)

DESIGN CRITERIA

PROPOSED RIGHT-OF-WAY ACQUISITIONS

APN:		SQUARE-FEET:	ACRES:
1.	107-240-008	155,708	3.57
2.	107-240-044	333,922	7.67
3.	107-240-043	63,162	1.45
4.	107-240-027	78,415	1.80
5.	107-240-005	53,240	1.22

ORCUTT COMMUNITY PLAN AMENDMENT

PROPOSED PROJECT: UNION VALLEY PARKWAY EXTENSION - RODEO DRIVE

Melissa Whittemore

From: Friedlander, Mark <mfriedlander@co.santa-barbara.ca.us>
Sent: Monday, June 29, 2020 11:22 AM
To: Melissa Whittemore
Subject: [EXT] FW: UVP comment letter

CAUTION: This email originated from outside of Rincon Consultants. Be cautious before clicking on any links, or opening any attachments, until you are confident that the content is safe .

FYI

From: Laurie Tamura <laurie@urbanplanningconcepts.com>
Sent: Monday, June 29, 2020 11:18 AM
To: Friedlander, Mark <mfriedlander@co.santa-barbara.ca.us>; Bell, Allen <abell@co.santa-barbara.ca.us>
Subject: FW: UVP comment letter

Caution: This email originated from a source outside of the County of Santa Barbara. Do not click links or open attachments unless you verify the sender and know the content is safe.

This is one correction that you may want to add to the project description

The Final Order of Condemnation states "It further appearing to the court that plaintiff was authorized to take possession of Parcels 11211-1 and 11211-2 on May 25, 2012."

The construction of the retaining basin and interchange were down while the condemnation proceedings were going through the court.

This might help in the document.

Laurie

Attachment 9

Mitigation Monitoring and Reporting Program

Mitigation Monitoring and Reporting Program

Orcutt Community Plan Amendment

Case Numbers: 18GPA-00000-00001, 19NGD-00000-00013

October 6, 2020

State Clearinghouse No.: 2020050541

This document is the Mitigation Monitoring and Reporting Program (MMRP) for the Orcutt Community Plan Amendment Project, proposed in Santa Barbara County, California, and accompanies the Final Initial Study-Mitigation Negative Declaration (IS-MND). Public Resources Code Section 21081.6(a)(1) requires that a lead agency adopt an MMRP before approving a project to mitigate or avoid significant impacts that have been identified in an IS-MND. The purpose of the MMRP is to ensure that the project proponent implements the required mitigation measures identified in the Final IS-MND as part of the overall project development process. In addition to ensuring implementation of mitigation measures, the MMRP provides guidance to agency staff and decision-makers during project implementation and identifies the need for enforcement action before irreversible environmental damage occurs. Where the Final IS-MND identified an impact to be less than significant, the Final IS-MND and MMRP do not require any mitigation measures.

The following table summarizes the mitigation measures for each issue area identified in the Final IS-MND for the project. Specifically, the table identifies each mitigation measure; the action required for the measure to be implemented; the time at which the monitoring is to occur; the monitoring conditions; and the agency or party responsible for ensuring that the monitoring is performed. In addition, the table includes columns for compliance verification.

Mitigation Measure/Condition of Approval	Plan Requirements and Timing	Monitoring	Responsible Agency/Party for Monitoring	Compliance Verification		
				Initial	Date	Comments
AIR QUALITY						
MM Air-01, Dust Control: In addition to the Santa Barbara County Air Pollution Control District (SBCAPCD)'s standard fugitive dust control measures, the project proponent shall comply with the following dust control components at all times including weekends and holidays: • Dust generated by the development activities shall be kept to a minimum with a goal of retaining dust on the site. • During clearing, grading, earth moving, excavation, or transportation of cut or fill materials, water trucks or sprinkler systems shall be used to prevent dust from leaving the site and to create a crust after each day's activities cease.	These dust control requirements shall be included in the Stormwater Pollution Prevention Plan (SWPPP). The dust monitor shall be designated prior to grading permit issuance. The dust control components shall apply from the beginning of any grading or construction throughout all development activities.	The County shall ensure measures are included on plans. The County shall spot check and ensure compliance on site. SBCAPCD inspectors shall respond to nuisance complaints.	County compliance monitoring staff, SBCAPCD			

Mitigation Measure/Condition of Approval	Plan Requirements and Timing	Monitoring	Responsible Agency/Party for Monitoring	Compliance Verification		
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• During construction, water trucks or sprinkler systems shall be used to keep all areas of vehicle movement damp enough to prevent dust from leaving the site. • The construction area shall be wetted down after work is completed for the day and whenever wind exceeds 15 miles per hour. • When wind exceeds 15 miles per hour, the site shall be watered at least once each day, including weekends and holidays. • Increased watering shall occur as necessary to prevent transport of dust off-site. • Soil stockpiled for more than two days shall be covered or treated with soil binders to prevent dust generation. Soil binders shall be reapplied as needed. • If the site is graded and left undeveloped for over four weeks, the project proponent shall immediately: (i) Seed and water to revegetate graded areas; (ii) Spread soil binders; and/or (iii) Employ any other method(s) deemed appropriate by the County Planning and Development Department or SBCAPCD.						
BIOLOGICAL RESOURCES						
MM Bio-01, Preconstruction Field Reconnaissance-Level Biology Survey. Prior to the initiation of construction activities, a preconstruction survey shall be conducted within the project construction footprint plus a 500-foot buffer by a qualified biologist in accordance with protocols established by the California Department of Fish and Wildlife (CDFW) and United States Fish and Wildlife Service (USFWS). The purpose of the survey shall be to determine if sensitive biological resources are present or have the potential to be present during the construction period.	These requirements shall be noted in plan specifications. The project proponent shall submit the survey report to the County, and the CDFW and/or USFWS, as appropriate, for review and approval prior to grading and construction permit issuance, if required, and no more than one year prior to commencement of construction. Native trees identified on-site shall be mapped onto a site-specific aerial photograph and topographic map and submitted to the County prior to grading	The County, and the CDFW and/or USFWS, as appropriate, shall review the survey report prior to issuance of grading and construction permits. County staff shall conduct site inspections to ensure compliance during grading and construction.	County compliance monitoring staff, CDFW and/or USFWS, as appropriate			

Mitigation Measure/Condition of Approval	Plan Requirements and Timing	Monitoring	Responsible Agency/Party for Monitoring	Compliance Verification		
				Initial	Date	Comments
	and construction permit issuance.					
MM Bio-02, Tree Protection Without a Tree Protection Plan. All grading, trenching, ground disturbance, and construction activities shall occur beyond six feet of the dripline of all native trees. a. Prior to the issuance of a permit, if required, for grading and construction, all native trees shall be fenced at least six feet beyond the dripline. Fencing shall be at least three feet in height of chain link or other material acceptable to the County and shall be staked every six feet. The project proponent shall place signs stating "tree protection area" at 15-foot intervals on the fence. Fencing shall remain in place throughout all grading and construction activities. b. Any unanticipated damage to trees from construction activities shall be mitigated in a manner approved by the County. This mitigation shall include but is not limited to tree replacement at a ratio of 1:1 or greater, and hiring of an outside consulting biologist or arborist to assess damage and recommend mitigation. The project proponent shall specify the impacted and replacement species, sizes, irrigation period in years, and locations of the replacement trees. The required mitigation shall be implemented under the direction of County staff prior to any further work occurring on site.	Fencing shall be graphically depicted on project plans. This condition shall be printed on project plans submitted for grading and construction permit approval, if required. Required fencing shall be installed prior to commencement of construction.	County staff shall review plans and confirm fence installation. County staff shall conduct site inspections to ensure compliance during grading and construction. If native trees are removed, the project proponent shall also demonstrate to the County that the replacement trees have been planted prior to final inspection.	County compliance monitoring staff			
MM Bio-03, Preconstruction Habitat Assessment and Protocol Surveys for California Red-Legged Frog and Western Spadefoot. Prior to the initiation of construction activities, a habitat assessment for California red-legged frog (*Rana draytonii*; CRLF) shall be conducted within the project construction footprint plus a 500-foot buffer by a County-qualified biologist following the USFWS's *Revised Guidance on Site Assessments and Field Surveys for the California Red-legged Frog* (August 2005). Surveys for western spadefoot (*Spea hammondii*) shall be conducted concurrently with the habitat assessment for CRLF. If western spadefoot adults or larvae are observed, CDFW shall be contacted. If the habitat assessment for CRLF identifies suitable habitat for the species, protocol surveys or modified protocol surveys, as appropriate, for the species	These requirements shall be noted in plan specifications. The habitat assessment shall be conducted by a County-qualified biologist approved by the County no more than one month prior to the initiation of construction activities. On-site locations of observed CRLF and western spadefoot and potentially suitable habitat for the species shall be mapped onto a site-specific aerial photographic map.	The County, and the CDFW and/or USFWS, as appropriate, shall review the habitat assessment report, including site-specific aerial photographic map showing the on-site locations of observed CRLF and western spadefoot and potentially suitable habitat,	County compliance monitoring staff, CDFW and/or USFWS, as appropriate			

Mitigation Measure/Condition of Approval	Plan Requirements and Timing	Monitoring	Responsible Agency/Party for Monitoring	Compliance Verification		
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shall be conducted in accordance with USFWS and CDFW protocols. The surveys shall include mapping of current locations of CRLF and western spadefoot for avoidance and relocation efforts and to assist construction monitoring efforts. If suitable habitat is identified and/or individuals of CRLF or western spadefoot are observed, Mitigation Measures Bio-04 and Bio-05 shall be implemented, as appropriate.		prior to issuance of grading and construction permits.				
MM Bio-04, Preconstruction Special-Status Wildlife Species Survey. Prior to the initiation of construction activities, a County-qualified biologist shall conduct a survey to evaluate the presence/absence of special-status wildlife species with a potential to occur within the biological study area (e.g., monarch butterfly [California overwintering population; *Danaus plexippus*], CRLF, western spadefoot, coast horned lizard [*Phrynosoma blainvillii*], northern California legless lizard [*Anniella pulchra*], and American badger [*Taxidea taxus*]) within the project construction footprint plus a 100-foot buffer. The survey shall include all components within the project construction footprint, including access roads and staging areas. The survey shall be conducted no more than 48 hours prior to the commencement of construction activities. If special-status wildlife species are observed within the project construction footprint and cannot be avoided by the project (e.g., unable to safely move out of the project area on its own volition, nests or dens are observed within the study area), the biologist shall notify the County and the appropriate agency (e.g., USFWS, CDFW) biological staff within one work day of the observation, and further consultation with the agencies shall be conducted to determine the appropriate course(s) of action before proceeding with construction activities. Potential courses of action may include, but will not be limited to, delay of construction schedule, or capture and relocation of individuals to adjacent appropriate habitat at least 200 feet from limits of construction activities by a USFWS-approved biologist authorized to capture and relocate federally-listed species. If relocation is required, the qualified biologist shall temporarily move any identified special-status species outside of the construction area, and temporary barriers shall be placed around the construction area, as practicable,	These requirements shall be noted in plan specifications. The survey shall be conducted by a County-qualified biologist approved by the County no more than 48 hours prior to the commencement of construction activities. If special-status wildlife species are observed within the project construction footprint and cannot be avoided by the project, the biologist shall notify the County and the appropriate agency (e.g., USFWS, CDFW) biological staff within one work day of the observation, and further consultation with the agencies shall be conducted to determine the appropriate course(s) of action before proceeding with construction activities.	The County, and the CDFW and/or USFWS, as appropriate, shall review the report of the survey results prior to issuance of grading and construction permits.	County compliance monitoring staff, CDFW and/or USFWS, as appropriate			

Mitigation Measure/Condition of Approval	Plan Requirements and Timing	Monitoring	Responsible Agency/Party for Monitoring	Compliance Verification		
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to prevent ingress by special-status species. Construction shall not proceed until the work area is determined to be free of special-status species. The results of these surveys shall be documented in a technical memorandum. County, and the CDFW and/or USFWS, as appropriate, shall review the report of the survey results prior to issuance of grading and construction permits.						
MM Bio-05, Biological Monitoring During Construction. If the habitat assessment for CRLF identifies suitable habitat and preconstruction or protocol surveys have identified presence, formal consultation with the USFWS and/or CDFW shall be required. In addition, if the surveys do not identify presence of CRLF but the study area contains suitable habitat, a biological monitor shall be on-site during all project construction activities that involve removal of the first 12 inches of soil/substrate, when ponded or flowing water is present, and work within sensitive habitat areas where sensitive species may be present (e.g., work within suitable upland or breeding habitat). If CRLF is observed within the project construction footprint during project construction and cannot be avoided by the project (e.g., unable to safely move out of the project area on its own volition, nests or dens are observed within the project construction footprint), a qualified biologist shall notify the appropriate agency (e.g., USFWS, CDFW) biological staff within one work day of the detection and further consultation with the agencies shall be conducted to determine the appropriate course(s) of action before proceeding with construction activities. Potential courses of action may include, but will not be limited to, delay of the construction schedule or capture and relocation of individuals to adjacent appropriate habitat at least 200 feet from the grading limits. Only a USFWS-approved biologist shall be authorized to capture and relocate federally-listed species. After the previously-specified construction activities have been completed that require a biological monitor to be on-site, the monitor shall then conduct weekly spot checks, for a minimum two-hour period per day. Dependent upon work conditions and/or prolonged construction activities, the County may discuss a potential decrease in biological	These requirements shall be noted in plan specifications. The project proponent shall designate a qualified biologist prior to the commencement of construction activities.	The County, and the CDFW and/or USFWS, as appropriate, shall inspections during construction for compliance.	County compliance monitoring staff, CDFW and/or USFWS, as appropriate			

Mitigation Measure/Condition of Approval	Plan Requirements and Timing	Monitoring	Responsible Agency/Party for Monitoring	Compliance Verification		
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monitoring in coordination with the USFWS and CDFW, as appropriate.						
MM Bio-06, Preconstruction Nesting Bird Surveys. To avoid impacts to nesting birds, tree removal and vegetation clearance shall be scheduled outside of the nesting season (February 1 to August 31). If vegetation clearance must occur during the nesting season, the following avoidance measures shall be implemented: a. If work occurs between February 1 and August 31, a preconstruction nesting bird survey shall be conducted within one week of ground-disturbing activities. If surveys do not locate nesting birds, construction activities may be conducted. b. If nesting birds are located, no construction activities shall occur within 100 feet of nests until chicks are fledged or the nest becomes inactive. Construction activities shall observe a 300-foot buffer for active raptor nests. The buffer from nests may be reduced based on a qualified biologist's recommendations. c. Occupied nests shall be mapped using GPS or survey equipment. A preconstruction survey report shall be submitted to the County immediately upon completion of the survey. The report shall detail appropriate fencing or flagging of the buffer zone and make recommendations for additional monitoring requirements. A map of the project construction footprint and nest locations shall be included with the report. The biologist conducting the nesting surveys shall have the authority to reduce or increase the recommended buffer depending upon site conditions. d. Occupied nests shall be monitored regularly to document nest success and check for project compliance with buffer zones. e. Appropriate best management practices (BMPs) shall be utilized to minimize noise disturbances to sensitive bird species.	These requirements shall be noted in plan specifications. Compliance shall be verified prior to and during construction within the nesting season.	The County shall perform periodic site inspections during construction to ensure compliance with these requirements.	County compliance monitoring staff			
HAZARDOUS MATERIALS/RISK OF UPSET						
MM H-01, Soil Sampling and Disposal. Prior to construction, a soil assessment shall be completed under the	These requirements shall be noted in plan specifications. The	The County shall ensure measures are	County compliance			

Mitigation Measure/Condition of Approval	Plan Requirements and Timing	Monitoring	Responsible Agency/Party for Monitoring	Compliance Verification		
				Initial	Date	Comments
supervision of a professional geologist or professional engineer. If soil sampling indicates the presence of any contaminant in quantities not in compliance with applicable laws, the California Regional Water Quality Control Board (RWQCB) or the California Department of Toxic Substances Control shall be contacted to determine proper disposal requirements. If required based on the levels of contamination in the study area soil, proper removal and disposal of contaminated soils removed during excavation and trenching activities shall be performed.	soil assessment shall be verified by the County prior to commencement of construction.	included on plans. The County shall spot check and ensure compliance on site during construction.	monitoring staff, RWQCB or DTSC, as appropriate			
MM H-02, Contaminated Soil Contingency Plan. If contaminated soils will be disturbed during project construction, the construction contractor shall develop and implement a Contaminated Soil Contingency Plan to handle treatment and/or disposal of contaminated soils.	The requirements of the Contaminated Soil Contingency Plan shall be noted in plan specifications. If contaminated soil is encountered during project construction, work shall halt and an assessment made to determine the extent of contamination. Treatment and/or disposal of contaminated soils shall be conducted in accordance with the Contingency Plan.	The County shall review the plan prior to issuance of grading permits and perform periodic site inspections during construction to ensure compliance with these requirements.	County compliance monitoring staff			
NOISE						
MM N-01, Construction Noise Control and Equipment Shielding. The project proponent, including all contractors and subcontractors, shall limit construction activity, including equipment maintenance and site preparation, to the hours of 7:00 a.m. and 4:00 p.m., Monday through Friday. No construction shall occur on weekends or State holidays. The County may grant extended working hours on weekdays and occasional working hours on Saturdays on an as-needed basis. Construction noise shall be limited to 65 CNEL as measured at the property line of any parcel with an existing noise-sensitive land use (e.g., residential dwellings, transient lodging, hospitals, educational facilities, libraries, churches, and places of public assembly). The contractor may utilize a combination of techniques to reduce the impact of construction to less than 65 CNEL, such as the following noise attenuation techniques:	These requirements shall be noted in plan specifications. The project proponent and contractor shall demonstrate compliance with noise standards to the County prior to commencement of construction and throughout construction activities.	The County shall perform periodic site inspections during construction to ensure compliance with these requirements and shall respond to complaints.	County compliance monitoring staff			

Mitigation Measure/Condition of Approval	Plan Requirements and Timing	Monitoring	Responsible Agency/Party for Monitoring	Compliance Verification		
				Initial	Date	Comments
• Use new or well-maintained construction equipment that reduces sound levels. • Maintain acoustic shielding of stationary construction equipment that generates noise in excess of 65 dBA Leq. • Limit construction activities to the hours of 7:00 a.m. to 4:00 p.m. • Implement a phased construction schedule to minimize or avoid multiple noise-generating activities occurring at the same time. • Locate stationary construction equipment away from noise-sensitive land uses. • Turn off idling equipment. • Use other noise-dampening and sound diversion techniques.						
PUBLIC FACILITIES						
MM SolidW-01, Solid Waste SRSWMP. The project proponent shall develop and implement a Source Reduction and Solid Waste Management Plan (SRSWMP) describing proposals to reduce the amount of waste generated during construction and enumerating the estimated reduction in solid waste disposed at each phase of project development.	The plan shall include but not be limited to: a. A description of how fill will be used on the construction site, instead of landfilling. b. A program to purchase materials that have recycled content for project construction. c. A plan to reduce construction and demolition debris to less than 350 tons, including a requirement to recycle a minimum of 85 percent of asphalt pavement debris. d. Recycling and composting programs including separating excess construction materials on site for reuse/recycling or proper disposal (e.g., concrete, asphalt, wood, brush). Separate on-site bins shall be	County staff shall review the SRSWMP prior to the issuance of permits for grading and construction. County staff shall conduct site inspections to ensure compliance with the SRSWMP during grading and construction.	County compliance monitoring staff			

Mitigation Measure/Condition of Approval	Plan Requirements and Timing	Monitoring	Responsible Agency/Party for Monitoring	Compliance Verification		
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	provided as needed for recycling. The project proponent shall submit the SRSWMP to the County for review and approval prior to permit issuance, if required, or prior to commencement of grading and construction.					
TRANSPORTATION/CIRCULATION						
MM Traf-01, Construction Transportation Management Plan. The construction contractor shall prepare and submit a Transportation Management Plan (TMP) to the County of Santa Barbara and Caltrans, as necessary, for review and approval prior to construction or issuance of applicable permits. The TMP shall be implemented throughout the duration of project construction.	The construction contractor shall include in the project-specific TMP: 1. Identify construction-related vehicle routes and timing restrictions. Truck routes shall minimize travel on roadways where truck traffic is ordinarily not permitted or weight restrictions are imposed. Haul trucks shall not travel to and from the study area during morning peak hours (between 7:00 a.m. to 9:00 a.m.) or evening peak hours (between 4:00 p.m. and 6:00 p.m.). 2. Identify construction staging area(s), including but not limited to the storage of equipment and materials, that are located in areas that minimize traffic hazards to motor vehicles, bicyclists, and pedestrians. Construction equipment and materials shall only occur within the identified staging areas. 3. The TMP shall include the following requirements to	The County shall conduct inspections of the project construction, and respond to complaints, as needed, during construction.	County compliance monitoring staff, County Public Works (PW) staff			

Mitigation Measure/Condition of Approval	Plan Requirements and Timing	Monitoring	Responsible Agency/Party for Monitoring	Compliance Verification		
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	minimize damage to the existing roadway network: • A list of precautionary measures to protect the existing roadway network, including but not limited to pavements, curbs, gutters, sidewalks, and drainage structures, shall be outlined. The construction contractor(s) shall be required to implement these measures throughout the duration of project construction. • Union Valley Parkway shall be surveyed prior to the start of project construction activities, and existing roadway conditions shall be summarized in a brief report. • Any damage to the roadway network that occurs as a result of project construction activities shall be noted, and the project sponsors shall repair all damage. 4. Identify emergency access routes and detours (if any) for emergency response along roadways potentially affected by project construction. Additionally, describe procedures in place to provide priority access for emergency service vehicles through the construction					

Mitigation Measure/Condition of Approval	Plan Requirements and Timing	Monitoring	Responsible Agency/Party for Monitoring	Compliance Verification		
				Initial	Date	Comments
	work zone. The TMP shall include requirements to notify local emergency response providers, including Santa Barbara County Fire Department, the Santa Barbara County Sheriff's Office, ambulance services, and paramedic services at least one week prior to the start of work within public ROWs if lane and/or road closures are required. To the extent possible, the duration of disruptions/closures to roadways and critical access points for emergency services shall be minimized. 5. Describe traffic control measures to be implemented to manage traffic and reduce potential traffic impacts in accordance with the most recent version of the California Manual of Uniform Traffic Control Devices. Traffic control measures shall include one or more of the following: flag persons; warning signs; lights; and/or barricades and/or cones to provide safe passage of vehicular (including cars and buses), bicycle, and pedestrian traffic, and access by emergency responders. 6. Identify off-street or turnout parking areas in which construction workers shall park and delineate those in the contractor specifications.					

Mitigation Measure/Condition of Approval	Plan Requirements and Timing	Monitoring	Responsible Agency/Party for Monitoring	Compliance Verification		
				Initial	Date	Comments
	Construction workers shall only park in designated areas. 7. Identify the location of any transit stops and transit and bicycle routes that may be temporarily impacted by construction activities and identify places to temporarily relocate transit stops and transit and bicycle routes, if necessary. Describe signage to be used for relocated transit, bicycle, or pedestrian facilities during project construction. Transit stops and transit and bicycle routes shall be temporarily relocated, as needed, with appropriate detour signage posted during project construction. The Construction TMP shall be prepared by the construction contractor, and the County shall review and approve the Construction TMP prior to issuance of grading and construction permits.					
WATER RESOURCES/FLOODING						
MM Wat-01, Post-Construction Stormwater Control Plan. Prior to project construction, the County shall prepare a final Post-Construction Stormwater Control Plan designed to prevent the entry of pollutants from the study area into the storm drain system after construction. The Post-Construction Stormwater Control Plan shall follow the County Stormwater Technical Guide for Low Impact Development. The Post-Construction Stormwater Control Plan shall include maps, figures, supporting design calculations, and a narrative explaining the methods and approach proposed to protect or enhance water quality. The	Project-specific BMPs and requirements from the SWPPP shall be included in plan specifications. The Contractor shall submit the SWPPP for County review. The SWPPP requirements shall be implemented prior to the commencement of construction and maintained throughout the construction phase.	The County shall review the SWPPP prior to issuance of grading and construction permits, if required, and shall perform site inspections throughout the construction phase to ensure the	County compliance monitoring staff, County PW staff			

Mitigation Measure/Condition of Approval	Plan Requirements and Timing	Monitoring	Responsible Agency/Party for Monitoring	Compliance Verification		
				Initial	Date	Comments
plan shall include supporting information including but not limited to the infiltration and retention properties of the native or engineered substrate, depth to groundwater, and the hydraulic design and pollutant treatment/removal capability of the proposed improvements adequate to ensure that water quality will be protected.		measures are fully implemented.				