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Transportation Impact Study and Caltrans Response Letter

Nights in White Satin Winery Use Permit P22-00236-UP
Planning Commission Hearing - August 20, 2025

Transportation Impact Study for the Nights in White Satin Winery Project

Prepared for the County of Napa

File Number: P22-00236

Submitted by

W-Trans

November 3, 2023

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Executive Summary

The proposed project would result in the construction of a winery that would produce up to 120,000 gallons of wine per year. The winery would have a maximum of 150 daily visitors with 25 full-time employees for typical operations and up to 10 additional part-time employees during harvest periods. Events would include five monthly events for up to 30 persons, ten annual events for 50 persons, and four events annually for up to 150 persons.

Based on the County's winery trip generation assumptions, the project would be expected to generate an average of 217 daily trips per weekday and 207 trips on Saturdays during non-harvest periods, with 70 trips during the weekday p.m. peak hour and 88 trips during the Saturday p.m. peak hour. The anticipated daily trips for a Friday and Saturday during the harvest season would be 247 and 237, respectively, with 79 trips during the Friday p.m. peak hour and 99 trips during the Saturday p.m. peak hour.

The project would need to implement a transportation demand management (TDM) plan to reduce VMT by 15 percent and have a less-than-significant impact on VMT. The goal of the recommended TDM plan is to reduce the average number of daily trips to 2.59 per employee and 1.62 per part-time employee as well as an average occupancy to 3.06 visitors per vehicle; to achieve these daily trips and vehicle occupancy, the TDM plan includes strategies such as a ridesharing program, telework schedule, guaranteed ride home program, on-site amenity improvements, cash-out, education and outreach programs, and bicycle facility improvements. Additionally, it is recommended that the program be monitored for one week every month.

There are no pedestrian, bicycle, or transit facilities near the project area, but this is consistent with County policy and the rural setting. As there are plans for a future bike lane along the site's frontage, adequate right-of-way should be dedicated if necessary to accommodate this facility. There were above-average collision and injury rates on the segment of SR 12-121 along the project frontage, but the potential for the project to contribute to these collisions will be addressed by the proposed installation of a left-turn lane serving the project driveway. It is further suggested that consideration be given to installing a radar speed feedback sign along the project frontage.

The project site would be accessed via a new driveway on SR 12-121 which would replace an existing driveway farther east. Adequate stopping sight distances of over 670 feet in both directions along SR 12-121 are available at the proposed driveway location. To maintain adequate sight lines, it is recommended that the placement of signs or tall landscaping be avoided near the driveway. The length of the proposed left-turn lane at the proposed driveway is adequate to accommodate the expected 95th percentile queue length of one vehicle or 20 feet. While neither a right-turn lane nor taper are warranted, the existing shoulder provides width to allow slowing vehicles to move out of the stream of through traffic to make a right-turn. Provision of right- and left-turn acceleration lanes was considered but does not appear to be necessary given the low volumes of traffic existing at the site as well as the lack of similar facilities at intersections with public roadways in the area.

The study area consisted of the section of SR 12-121 fronting the project site and the intersections of SR 12-121/Old Sonoma Road and SR 12-121/SR 29. Analysis of the intersection of SR 12-121/Napa Road was considered but, as this intersection is in the County of Sonoma and on a Caltrans facility, for which service levels are no longer considered in evaluating projects, further study was not performed. The study intersections currently operate at LOS C or higher during the weekday peak hour and LOS E or lower during

the weekend peak hour. With the project trips added these service levels would be unchanged at either intersection and therefore project effects are considered acceptable.

Under anticipated future volumes the intersections of SR 12-121/Old Sonoma Road and SR 12-121/SR 29 are expected to continue operating LOS F and LOS C respectively without and with project-related traffic, which is considered acceptable under the County's policies.

The proposed on-site parking supply would be adequate for the anticipated peak demand during typical operations, and the proposed overflow parking would be adequate to accommodate periodic events.

Introduction

This report presents an analysis of the potential traffic impacts that would be associated with development of a proposed winery to be located on Assessor's Parcel Number 047-380-009, on the south side of State Route (SR) 12-121 about one-half-mile east of the intersection with Haire Lane in the County of Napa. The traffic study was completed in accordance with the criteria established by the County and is consistent with standard traffic engineering techniques.

Prelude

The purpose of a traffic impact study is to provide County staff and policy makers with data that they can use to make an informed decision regarding the potential transportation impacts of a proposed project, and any associated improvements that would be required to mitigate these impacts to an acceptable level under CEQA, the County's General Plan, or other policies. This report provides an analysis of those items that are identified as areas of environmental concern under the California Environmental Quality Act (CEQA) and that, if significant, require an EIR. Impacts associated with access for pedestrians, bicyclists, and to transit; the vehicle miles traveled (VMT) generated by the project; potential safety concerns such as increased queuing in dedicated turn lanes, adequacy of sight distance, need for turn lanes, and need for additional right-of-way controls; and emergency access are addressed in the context of the CEQA criteria. While no longer a part of the CEQA review process, vehicular traffic service levels at key intersections were evaluated for consistency with General Plan policies by determining the number of new trips that the proposed use would be expected to generate, distributing these trips to the surrounding street system based on anticipated travel patterns specific to the proposed project, then analyzing the effect the new traffic would be expected to have on the study intersections and need for improvements to maintain acceptable operation. Adequacy of parking is also addressed as a policy issue.

Applied Standards and Criteria

The report is organized to provide background data that supports the various aspects of the analysis, followed by the assessment of CEQA issues and then evaluation of policy-related issues. The CEQA criteria evaluated are as follows.

Would the project:

a. Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities?
b. Conflict or be inconsistent with CEQA Guidelines § 15064. 3, subdivision (b)?
c. Substantially increase hazards due to a geometric design feature (e. g., sharp curves or dangerous intersections) or incompatible uses (e. g., farm equipment)?
d. Result in inadequate emergency access?

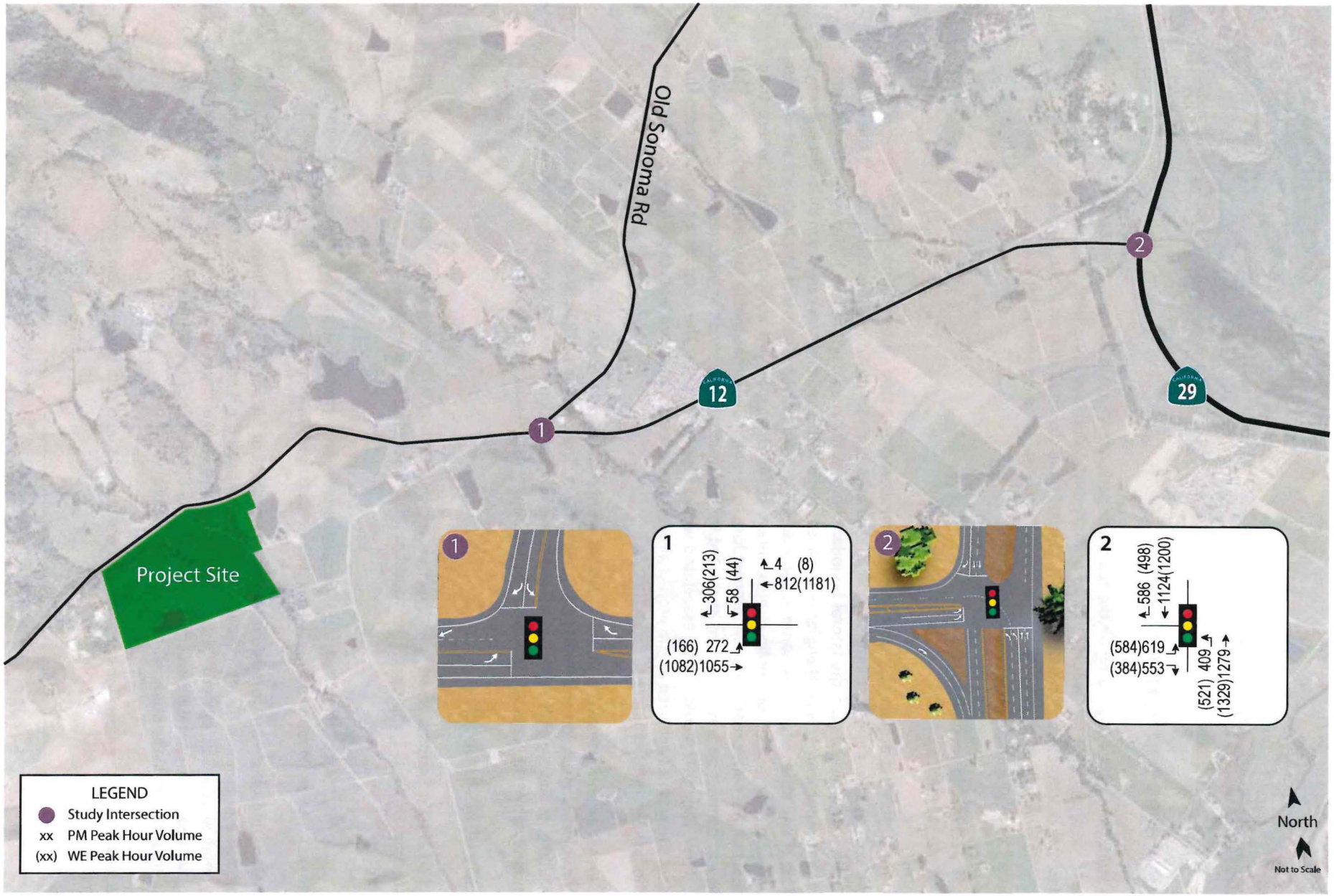
The County of Napa does not prescribe thresholds of significance regarding queue lengths. However, an increase in queue length due to project traffic was considered a potentially significant impact if the increase would cause the queue to extend out of a dedicated turn lane into a through traffic lane, or the back of queue into a visually restricted area, such as a blind corner. If queues would already be expected to extend past a dedicated turn lane or into a visually restricted area without project traffic, the project's

impact would only be considered to constitute a potentially adverse effect if it would cause the queue to be unacceptable in a manner that would not be true otherwise (in other words, if it already extended beyond the turn lane capacity but was visible and would extend into a visually restricted area with the project, this would be considered potentially significant).

Project Profile

The Nights in White Satin Winery is a proposed new winery that would produce up to 120,000 gallons of wine per year on a site that fronts both Neuenschwander Road and SR 12-121. As planned, all grapes for the wine production would be sourced from the site or other vineyards owned or leased by the applicant; an assumed 750 tons of grapes would be imported. The facility will be staffed by up to 25 full-time employees, with up to 10 additional part-time employees during harvest. Daily visitation would be capped at 150 persons, with an average of 450 persons for the week. Five monthly marking events for up to 30 persons are proposed as well as ten annual events for 50 persons and four events annually for up to 150 persons. Access to the site is proposed via SR 12-121, with a left-turn lane on SR 12-121 proposed as part of the project. A total of 50 parking spaces would be provided on-site, 16 for employees and 34 for visitors. The project site is located about 900 feet east of the Sonoma County Line, as shown in Figure 1.

The file number for the project is P22-00236.



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Transportation Impact Study for the Nights in White Satin Winery Project

Figure 1 – Study Area, Existing Lane Configurations, and Existing Traffic Volumes

Transportation Setting

Study Area and Periods

The study area varies depending on the topic. For pedestrian trips it consists of all streets within a half-mile of the project site that would lie along primary routes of pedestrian travel, or those leading to nearby generators or attractors. For bicycle trips it consists of all streets within one mile of the project site that would lie along primary routes of bicycle travel. For the safety and operational analyses, it consists of the project frontage and the following intersections:

1. SR 12-121/Old Sonoma Road
2. SR 12-121/SR 29

It is noted that the project driveway was not considered as a study intersection. The *California Vehicle Code,* Section 365, defines an intersection as "the area embraced within the prolongation of the lateral curb lines, or, if none, then the lateral boundary lines of the roadways, of two highways which join one another at approximately right angles or the area within which vehicles traveling upon different highways joining at any other angle may come in conflict." This definition specifies that intersections are created where two "highways," or public streets, intersect. As driveways are not public streets, where they connect with a public road is not an intersection, so it would be unreasonable to evaluate it as such. The driveway connection was, however, evaluated for operational issues such as adequacy of sight distance and delay, though it would not be associated with a Level of Service. The need for a turn lane onto the project site was not analyzed as the project already proposes to add a turn lane, though the design queue of the turn lane was evaluated.

The weekday and weekend p.m. peak periods were evaluated as these time periods reflect the highest traffic volumes areawide and for the proposed project. The evening peak hour occurs between 4:00 p.m. and 6:00 p.m. and typically reflects the highest level of congestion of the day during the homeward bound commute, while the weekend p.m. peak occurs between 1:00 p.m. and 4:00 p.m.

Study Intersections

SR 12-121/Old Sonoma Road is a signalized tee intersection with protected left-turn phasing on the eastbound SR 12-121 approach. The southbound Old Sonoma Road approach has a right-turn overlap phase.

SR 12-121/SR 29 is a signalized tee intersection with protected left-turn phasing on the northbound approach. The eastbound approach has a channelized right-turn lane.

Consideration was given to evaluating the intersection of SR 12-121/Napa Road which is west of the project site in Sonoma County. Through past evaluations it is known that this intersection is currently operating at LOS C or better during the weekday and weekend peak periods. As this intersection is in another county, is operating acceptably, and is on a Caltrans facility an analysis of LOS is not required, it was not included in the study area for this evaluation.

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

Study Roadway

SR 12-121 is an east-west highway with one 12-foot lane in each direction. The posted speed limit is 55 mph. There are no pedestrian facilities on the road within miles of the project site. Counts for the segment obtained on September 8 and 9, 2017, were used for the analysis as this pre-pandemic count was determined to be higher than a post-pandemic count obtained in 2020. Copies of all counts are provided in Appendix A.

Collision History

The collision history for the study area was reviewed to determine any trends or patterns that may indicate a safety issue. Collision rates were calculated based on records available from the California Highway Patrol as published in their *Statewide Integrated Traffic Records System (SWITRS)* reports. The most current five-year period available is June 1, 2017, through May 31, 2022.

The collision rate for SR 12-121 was calculated based on crashes within one-half-mile of the project driveway. The calculated collision rate for the study segment was compared to average collision rates for similar facilities statewide, as indicated in *2019 Collision Data on California State Highways,* California Department of Transportation (Caltrans). These average rates statewide are for segments in the same environment (urban, suburban, or rural) and the same number of lanes. The study segment had 55 collisions in the study period, 28 injuries, and a calculated collision rate of 2.62 crashes per million vehicle miles (c/mvm) as compared to the state average of 0.70 c/mvm. Most collisions were due to unsafe speeds. The injury rate for the study segment during the study period was 50.9 percent while the statewide average is 38.9 percent.

Further review indicates that many of these collisions occurred during highly congested times, or 3 p.m. to 5 p.m., and are likely attributable to drivers traveling too quickly to be able to slow down when encountering traffic either slowed or stopped due to congestion. The most common types of crashes were rear ends and drivers running off the road, with unsafe speed routinely cited as the primary collision factor. The project as proposed will provide a left-turn lane for westbound traffic entering the project driveway and existing eight-foot shoulder provide space for right-turning traffic to move out of the way of through traffic, so the project would not be expected to contribute to these existing patterns. Increased enforcement or implementation of radar feedback signs could be deployed to achieve a reduction in travel speeds which could then contribute to a decrease in collision frequency. The collision rate calculations are provided in Appendix B.

Project Data

The project consists of a new winery that would produce up to 120,000 gallons of wine per year. There would be up to 25 full-time employees for typical operation, and up to 10 additional part-time employees during harvest. Daily visitation would be no more than 150 visitors, with an average of 450 visitors for the week. Five monthly marking events are proposed for up to 30 attendees as well as ten annual 50-person events and four annual 150-person events. The site would be accessed from SR 12-121, with a left-turn lane proposed as part of the project. A total of 50 parking spaces would be provided on-site with 16 spaces reserved for employees and 34 reserved for visitors. The proposed project site plan is shown in Figure 2.

Trip Generation

The anticipated trip generation for the proposed project was estimated using the Napa County Winery Trip Generation Worksheet. Based on application of the standard assumptions for non-harvest conditions, the proposed project is expected to generate an average of 217 trips per weekday, including 70 trips during the weekday peak hour, and 207 trips on a Saturday, including 88 trips during the Saturday peak hour. During harvest the project would be expected to generate 247 trips on a weekday and 237 on a Saturday, including 79 and 99 trips during the weekday p.m. and Saturday p.m. peak hours respectively.

As the County of Napa's Winery Traffic Information/Trip Generation Sheet does not include guidance on inbound versus outbound trips during the peak hours, it was assumed that two-thirds of the trip ends at the winery would be outbound during the Friday p.m. peak hour since most of the trips would be associated with employees and customers leaving at the closure of the winery. For the Saturday p.m. peak hour, it was assumed that inbound and outbound trip ends would be evenly split. The trip generation summary is shown in Table 1. The Winery Trip Generation Form is provided in Appendix C.

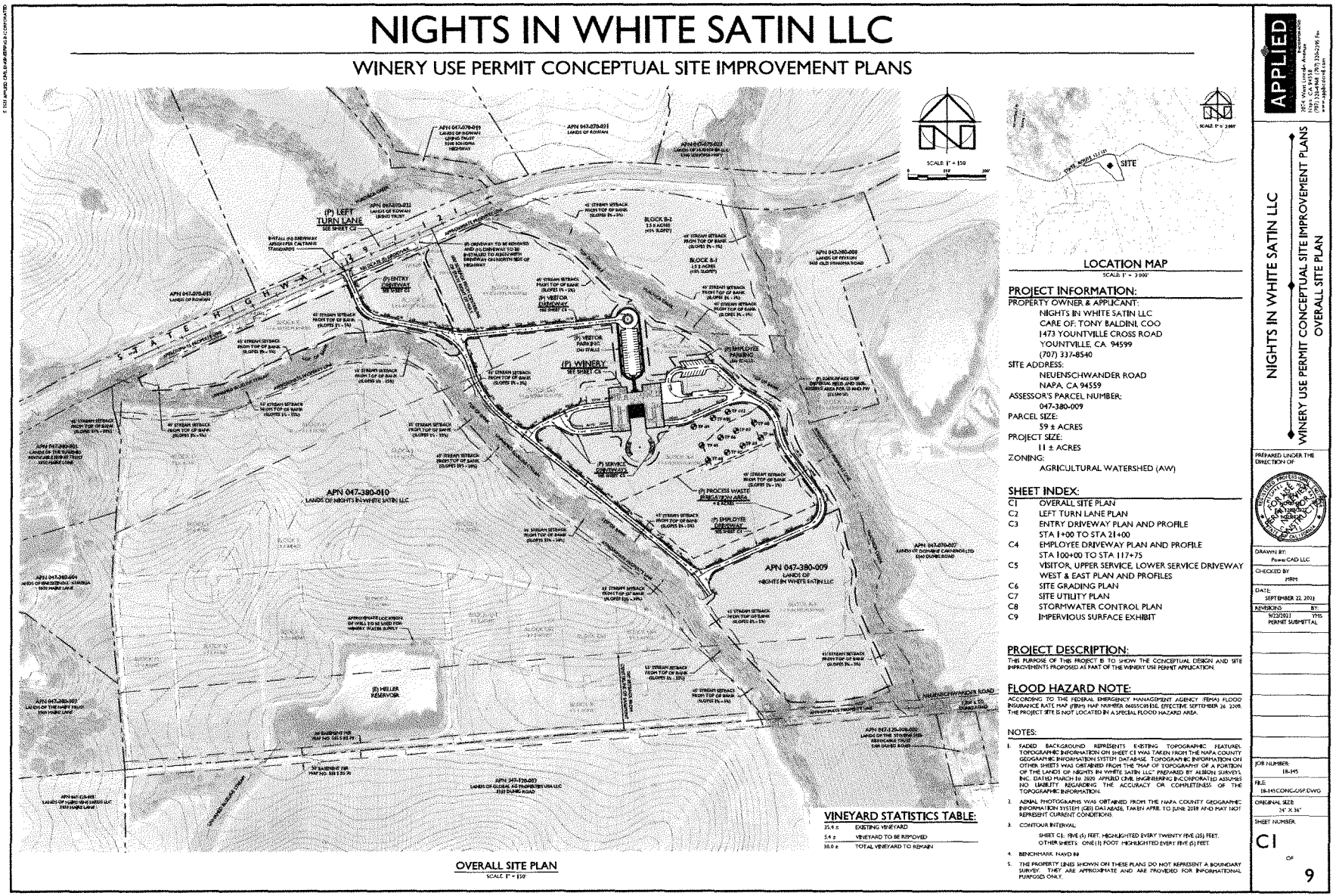
Table 1 – Trip Generation Summary

Land Use	Daily		Weekday PM Peak Hour			Weekend PM Peak Hour		
	Weekday	Weekend	Trips	In	Out	Trips	In	Out
Non-Harvest	217	207	70	23	47	88	44	44
Harvest	247	237	79	26	53	99	50	49

Note: Trip generation as estimated above does not include special events.

Trip Distribution

The pattern used to allocate new project trips to the street network was determined based on anticipated travel patterns for project patrons and employees. Given the location of the site near the boundary between Napa and Sonoma Counties and the resulting proximity to wineries to both the east and west, trips were split evenly between the two directions. Trips to the east were then further split between Old Sonoma Road and SR 29 to the north and south. The applied trip distribution is detailed in Table 2.



Source: PowerCAD LLC 1/17

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Transportation Impact Study for the Nights in White Satin Winery Project

Figure 2 – Site Plan

Table 2 – Trip Distribution Assumptions	
Route	**Percent**
To/From West SR 121-12	50%
To/From Old Sonoma Rd	10%
To/From North SR 29	20%
To/From South SR 29	20%
TOTAL	**100%**

Circulation System

This section addresses the first transportation bullet point on the CEQA checklist, which relates to the potential for a project to conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities.

Pedestrian Facilities

Pedestrian Facilities

Pedestrian facilities include sidewalks, crosswalks, pedestrian signal phases, curb ramps, curb extensions, and various streetscape amenities such as lighting, benches, etc. There are no sidewalks or pedestrian facilities within miles of the project site. Given the rural character of the area, limited pedestrian traffic occurs and the condition wherein pedestrians are expected to walk on the shoulders on each side of the roadway is considered acceptable for the rural setting.

Finding – The lack of existing dedicated facilities for pedestrians in the project vicinity is consistent with the rural setting. No such facilities are required along the project's frontage.

Bicycle Facilities

Existing and Planned Bicycle Facilities

The *Highway Design Manual*, Caltrans, 2020, classifies bikeways into the following four categories:

- **Class I Multi-Use Path** – a completely separated right-of-way for the exclusive use of bicycles and pedestrians with cross flows of motorized traffic minimized.
- **Class II Bike Lane** – a striped and signed lane for one-way bike travel on a street or highway.
- **Class III Bike Route** – signing only for shared use with motor vehicles within the same travel lane on a street or highway.
- **Class IV Bikeway** – also known as a separated bikeway, a Class IV Bikeway is for the exclusive use of bicycles and includes a separation between the bikeway and the motor vehicle traffic lane. The separation may include, but is not limited to, grade separation, flexible posts, inflexible physical barriers, or on-street parking.

In the project area, there are no existing bike facilities; however, according to the *2019 Napa Countywide Bicycle Plan,* Napa Valley Transportation Authority (NVTA) a Class III Bike Route is proposed on SR 12-121 from the county boundary to SR 29. As the shared use of a travel lane on a 55-mph facility is not generally advisable, it appears likely that the map has incorrectly shown a Class III facility when a Class II facility is intended. There are currently eight-foot shoulders on both sides of SR 12-121 which can be used for a future Class II facility. The plan as proposed maintains the eight-foot shoulders on SR 12-121. However, the project plans should be coordinated with the plans for the future bike lane to ensure that there is sufficient right-of-way for the planned bike lane.

Finding – There are no bicycle facilities serving the project site. This is consistent with County policy and the planned facilities will improve bicycle access. The project as proposed would not affect the existing eight-foot shoulders or impede the County's plan to install bike lanes in the future.

Recommendation – Plans for the proposed frontage improvements should be coordinated with the plan line for the future installation of a bike lane along the site's frontage and right-of-way dedicated if necessary to accommodate this planned future improvement.

Transit Facilities

Transit Facilities

Vine Transit provides fixed route bus service in Napa County. As there are no transit stops within a comfortable walking distance of the project site (one-half mile) and it would therefore not create additional demand for transit, the project would be expected to have a less-than-significant impact on transit.

Finding – There are no transit facilities serving the project site. This is consistent with County policy.

Significance Finding – The project would have a less-than-significant impact on facilities for pedestrians, bicyclists and transit riders and does not conflict with any policies, programs or plans for these modes.

Vehicle Miles Traveled (VMT)

The potential for the project to conflict or be inconsistent with CEQA Guidelines § 15064.3, subdivision (b) was evaluated based the project's anticipated Vehicle Miles Traveled (VMT).

Vehicle Miles Traveled

Senate Bill (SB) 743 established that the increase in Vehicle Miles Traveled (VMT) as a result of a project is now to be used as the basis for determining California Environmental Quality Act (CEQA) impacts with respect to transportation and traffic. The *Napa County Traffic Impact Study (TIS) Guidelines*, 2022, include a methodology for analyzing VMT for winery projects as well as thresholds of significance for use in CEQA analysis. The thresholds are based on Policy CIR-7 from the County's General Plan Circulation Element, which states that "projects for which the specified VMT reduction measures would not reduce unmitigated VMT by 15 or more percent shall be considered to have a significant environmental impact."

Applying the methodology from the TIS guidelines, the VMT to be generated by the project was estimated by calculating the project's maximum number of net new daily passenger trips and multiplying that by the countywide average trip length. For CEQA purposes, VMT is estimated based on passenger vehicle and light duty truck trips and does not include trips from heavy-duty trucks; therefore the number of project-related truck trips was deducted from the project trip generation to estimate the project's VMT.

Using trip data collected from mobile devices, the *Napa Valley Behavior Study*, 2020, estimated the average trip length for all trips that begin or end in unincorporated Napa County to be 11.8 miles. Using the County's trip generation spreadsheet, the project is estimated to generate an average of 247 trips per day on weekdays during harvest season. After deducting the 2 truck trips per day during normal operation and 13 truck trips per day during harvest as estimated on the County's trip generation worksheet, there would be an estimated 215 passenger vehicle trips per day during normal operation and 234 passenger vehicle trips per day during harvest associated with the project.

Assuming an average trip length of 11.8 miles, the project's VMT would be 2,473 miles normally and 2,761 miles during harvest. To achieve a less-than-significant VMT impact, County policy requires trip reduction measures to be incorporated to reduce the project's unmitigated VMT by 15 percent; based on the assumption that project trips are equal to the average trip length, this can be achieved by reducing the number of project trips by 15 percent.

Finding – The project would need to reduce the number of trips generated by employees and guests by 15 percent to have a VMT impact that is less than significant.

Transportation Demand Management Plan

To address the project's anticipated potential impact on VMT, implementation of a Transportation Demand Management (TDM) Plan is recommended. The TIS guidelines include potential trip reduction strategies for use with winery projects based on their potential to reduce the number of trips or to reduce trip length, as these are the two variables that impact VMT. The guidelines indicate that additional measures may be incorporated into the TDM Plan if they are determined to be appropriate for the proposed project.

The recommended strategies address both employee and visitor trips. TDM measures aim to reduce single-occupancy vehicle trips during peak hours, parking demand, and total vehicle miles traveled (VMT) through use of alternative modes of transportation and more efficiently planned trips. Due to the project's rural location, the site does not have as many options to reduce VMT as one located in an urban environment, but the winery would have up to 25 full-time and 10 part-time employees, as well as up to 150 daily visitors, so there is potential to reduce vehicular trips and parking demand with implementation of a TDM program.

The County has established metrics for estimating the trip generation of wineries. This adopted standard includes 3.05 trips per day for full-time employees and 1.90 trips per day for part-time employees. Visitors to the tasting room on weekdays are assumed to arrive with an average of 2.6 persons per vehicle based on past data collected by the County. To achieve a 15-percent reduction in VMT, a 15-percent reduction in trips is suggested. This would translate to full-time employees making an average of 2.59 trips per day, part-time employees generating 1.62 trips per day and guests arriving at an average occupancy of 3.06 persons per vehicle.

The focus of the project's TDM Program would be to provide information, encouragement, and access to travel options to reduce the number of vehicle trips during peak hours and overall, thus reducing VMT. The following measures are suggested and are consistent with the recommended strategies in the County's TIS guidelines as well as the goals of Caltrans' *Smart Mobility 2010: A Call to Action for the New Decade*. It is recommended that the incentives offered as part of the program be available for the first two years of operation, after which the effectiveness of the program should be reevaluated and modified, if needed.

Ridesharing Program

Carpooling is one of the most common and cost-effective alternative modes of transportation and one that commuters can adopt part-time. There are numerous benefits to ridesharing. Carpooling can reduce peak-period vehicle trips and increase commuters' travel choices. Further, it reduces congestion, road and parking facility costs and pollution emissions. Carpooling tends to have the lowest cost per passenger-mile of any motorized mode of transportation, since it makes use of a vehicle seat that would otherwise be empty. Carpooling also provides consumer financial savings by decreasing fuel and parking costs.

Ridematching

The greatest barrier to workplace carpooling is often simply being able to identify and travel with other nearby employees. Fortunately, there are many services that can assist in pairing employees within the same organization or across organizations. The most basic publicly available service is 511.org's free ridematching service. There are also various private ridematching providers (e.g., Zimride, RideAmigos, Via, Scoop) that can effectively create carpool networks while making them safe and convenient for their users. The Napa Valley Transportation Authority (NVTA) uses RideAmigos as a resource for local employers as part of its V-Commute program.

Tele-Work/Compressed/Flex Schedules

Telework (i.e., working from home) and compressed schedules (i.e., working more than eight hours each day and shortening the work week) are among the most commonly employed scheduling means to reduce vehicle trips. While many winery employees are required to be on-site to perform their jobs, some staff may be able to take advantage of these options.

Guaranteed Ride Home Program

One of the reasons that many employees do not carpool to work is the fear of being stranded should they need to leave in an emergency. Employees who carpool to work should be guaranteed a ride home in the case of an emergency or unique situation. The Napa Valley Transportation Authority (NVTA) offers a Guaranteed Ride Home (GRH) program, which is available to employees who carpool or commute via alternative modes. Participants can use a taxi, rental car, Lyft, Uber, or other means to get home in an emergency – such as taking care of a sick child or other unexpected need – and are reimbursed for the full cost of the service. The program is available to all who work or attend college in Napa County and is free to join, but registration is required. As part of the project's TDM program, employees would be provided information about V-Commute and would be encouraged to register for the service.

Alternative Mode Subsidy

A subsidy program operates when employers pay their employees a cash incentive for the days when they use an alternative mode of transportation (e.g., bike or carpool to work) to help reduce vehicle commute trips and emissions. As an example of cost, a subsidy of three dollars per day could be offered to employees who do not drive alone to work.

On-Site Amenities

Although it is not a transportation program, on-site employee and visitor amenities serve to reduce vehicle trips. This can take many forms depending on the need. For example, providing lunch or food options on-site allows workers and visitors to forgo midday trips to purchase lunch.

Education, Outreach, and Marketing

Transportation Coordinator

The presence of a staff person dedicated part-time to overseeing and managing the TDM program is helpful in ensuring the ongoing success of these programs. This would not be a distinct position, but instead would be a role that is integrated into the on-site manager. The duties for this position could include the following:

- Create and distribute employee transportation information welcome packets;
- Maintain and update a bulletin board or other physical source of transportation information;
- Distribute Napa Bicycle Coalition maps;
- Monitor bicycle facilities;
- Administer the cash-out program;
- Promote the ride-matching program.

Welcome Packet for New Employees

New employees should be provided with a welcome packet containing relevant transportation information. The packet could include information about NVTA's V-Commute program, which offers resources related to non-automobile transportation options, such as bicycle transportation information, ride-matching services, and the guaranteed ride home program. Transit maps for Vine Transit service could also be provided.

Visitor Transportation Information

The site is on SR 12-121 in an area that contains numerous other wineries and tasting rooms, so the project is likely to attract a substantial amount of linked traffic from guests visiting multiple tasting rooms in the area rather than generating new trips associated with the project itself. As is typical with existing wineries in the area, visitors in large groups often arrange for their own private van or shuttle transportation, resulting in fewer trips to and from the site than might otherwise occur. This is a common means of transportation as most visitors intend to drink wine, which can impair driving abilities.

Providing guests with online information regarding transportation options for travel to the winery can help encourage guests to consider non-auto or rideshare options. This information should be emailed or mailed to guests as part of their registration confirmation process to assist in their logistics planning. Guests making appointments for four or more persons should be encouraged to use private vans or a shuttle for their entire group.

Bicycle Benefits

Bicycle Parking

The provision of both short-term and long-term bicycle parking is important. Secure long-term parking (e.g., bike lockers) is a critical component in encouraging employees to bike to work as the lack of secure parking is often cited by employees as a deterrent. Short-term parking (e.g., bike racks) can be utilized by employees or visitors and is generally an inexpensive way to accommodate visitors traveling between wineries. As proposed the project would include bicycle parking south of the visitor parking stalls.

Shared Bicycles and Maintenance Tools

Many businesses have experience in providing one or more vehicles on-site for employee use during work hours. Today, many employers are offering the same benefit in the form of shared bicycles for employee or guest use. These bicycles are ideal for short trips and are a cost-effective way of providing a new mobility option to nearby wineries or other destinations during the workday. Bicycles that are shared or used by individuals can be serviced with simple tools such as a pump and tire patches that are kept on-site.

Monitor Performance

It is important to continually monitor the performance of a TDM program and adjust measures as necessary to ensure its success. Employers should conduct mode split and VMT surveys before the implementation of a TDM program and each year thereafter to both make adjustments and use as a marketing material. Employee satisfaction surveys are also an effective way of ensuring a quality TDM program.

Recommendation – It is recommended that TDM measures be implemented that result in a 15-percent reduction from the metrics typically associated with winery activity. Activity at the winery should be monitored to ensure that, on average, full-time employees generate no more than 2.59 trips per day, part-time employees generate 1.62 trips per day or less and guests arrive at an occupancy of 3.06 persons per vehicle or more. It is suggested that the monitoring occur for one week every month, ideally covering the same dates for every month; this data would then be averaged over the course of the year to achieve annualized rates.

Vehicle Miles Traveled Reduction

The expected VMT reductions associated with the various TDM measures were estimated for the project's employee trips based on information published in the California Air Pollution Officers Association (CAPCOA) report *Handbook for Analyzing Greenhouse Gas Emission Reductions, Assessing Climate Vulnerabilities, and Advancing Health and Equity*, CAPCOA, 2021, the location of the project site, and knowledge of transportation characteristics of the area. Since quantitative trip reduction formulas are not available for visitor trips, the recommended TDM measures are those found to be most effective in this context and the actual trip reductions will be measured through the monitoring process.

The estimated VMT reduction calculations are summarized in Table 3.

Table 3 – Estimated Employee VMT Reduction

TDM Measure	VMT Reduction (%) Project Estimate
Ridesharing Program	6.4
Telework/Compressed/Flex Schedules	4.9
Carpool/Bicycle Subsidy	3.0
Education, Outreach, and Marketing	2.0
Bicycle Benefits	Supportive
Total Potential VMT Reduction	15.3
Adjusted to 15% Maximum for Suburban/Rural Location	**15.0**

Notes: TDM = transportation demand management; VMT = vehicle miles travelled

The TDM strategies listed above are projected to result in an employee VMT reduction potential of 15.3 percent. The maximum achievable reductions are, however, influenced by the context of the site according to CAPCOA. For a suburban location, CAPCOA indicates that the maximum potential reduction is 15 percent.

Vehicle Trip Reduction

In addition to reducing VMT, the TDM plan would reduce employee and visitor vehicle trips. Table 4 shows the anticipated daily and annual vehicle trip reduction from this plan.

Table 4 – Estimated Vehicle Trip Reduction			
Condition	**Daily Trips**	**Days**	**Annual Trips**
Weekday, Non-Harvest	215	206	44,290
Weekday, Harvest	235	55	12,925
Weekend, Non-Harvest	205	82	16,810
Weekend, Harvest	225	22	4,950
Subtotal	***880***	***365***	***321,200***
Reduction – 15%	*-132*		*-48,180*
Total	**748**		**273,020**

Note: Daily trips do not include heavy truck trips

Significance Finding – With incorporation of TDM measures, the project would be expected to have a less-than-significant impact in terms of VMT.

Safety Issues

The potential for the project to impact safety was evaluated in terms of the adequacy of sight distance and need for turn lanes at the project access point as well as the adequacy of stacking space in dedicated turn lanes at the study intersections to accommodate additional queuing due to adding project-generated trips and need for additional right-of-way controls. This section addresses the third transportation bullet on the CEQA checklist which is whether or not the project would substantially increase hazards due to a geometric design feature (e. g., sharp curves or dangerous intersections) or incompatible uses (e. g., farm equipment).

Site Access

The project as proposed would be accessed via a new driveway located approximately 300 feet west of the existing driveway and across from another driveway that has a left-turn lane. As part of the project SR 12-121 would be restriped to provide a left-turn lane in the westbound direction and keep the eight-foot shoulders on both sides of the road. It is noted that given the high volumes of traffic on SR 12-121, these improvements would be warranted.

Sight Distance

At driveways, a substantially clear line of sight should be maintained between the driver of a vehicle waiting to enter the street and the driver of an approaching vehicle. Sight distances along SR 12-121 at the project driveway location were evaluated based on sight distance criteria contained in the *Highway Design Manual* published by Caltrans. The recommended sight distance for driveway approaches is based on stopping sight distance and uses the approach travel speed as the basis for determining the recommended sight distance.

For the posted speed limit of 55 mph, the recommended minimum corner sight distance is 530 feet and 610 feet to the left and right respectively. According to field measurements sight distances to and from the proposed driveway are more than 670 feet in both directions, which is adequate for 5 mph over the posted speed limit.

While sight lines from the driveway are currently clear, care should be taken to maintain unobstructed sight lines and placement of signage, monuments, or other structures within the vision triangles at the driveway should be avoided. Any landscaping in the vision triangle should be lower than three feet tall for ground cover and tree canopies trimmed to be four feet above the pavement surface.

Finding – Sight distances at the project driveway are adequate to accommodate all turns into and out of the project site.

Recommendation – To preserve existing sight lines, any new signage, monuments, or other structures should be positioned outside of the vision triangles of a driver waiting on the project driveway. Landscaping planted in the vision triangles should be low-lying or above seven feet and maintained to remain outside the area needed for adequate sight lines.

Access Analysis

Turn Lane Warrants

Although a left-turn lane is proposed by the project, the need for one was evaluated for potential inclusion in the encroachment permit package. As shown on the output provided in Appendix D, a left-turn lane would be warranted under existing weekday or weekend p.m. peak hour volumes with the project.

The need for a right-turn lane along the project frontage was evaluated based on criteria contained in *The Development of Criteria for the Treatment of Right Turn Movements on Rural Roads*, Cottrell, 1981. Based on this methodology, neither a right-turn lane nor a right-turn taper are warranted during either the weekday p.m. peak hour or weekend midday peak hour using either 2017 or 2020 volumes. While a right-turn taper is not warranted the existing eight-foot shoulder can serve the same purpose as a right-turn taper when needed. These results are also shown on the output provided in Appendix D.

Consideration was also given to the potential need for acceleration lanes for both right and left turns out of the driveway. Because a right-turn deceleration lane is not warranted it appears reasonable to assume that an acceleration lane would also not be warranted, though there are no quantitative warrants to determine the need for an acceleration lane. A review of conditions at nearby four-legged intersections indicates that left-turn acceleration lanes are not typically provided. Given the low volume of traffic on this driveway as well as the geometric requirements to add a left-turn acceleration lane, it does not appear that acceleration lanes are necessary.

Finding – A left-turn lane is warranted on SR 12-121 at the proposed driveway, and this improvement is proposed as part of the project. Neither a right-turn lane nor a taper are warranted. While not needed based on the results of the analysis, the existing eight-foot shoulder can serve the function of a right-turn taper. Acceleration lanes do not appear to be warranted or necessary for either right turns or left turns.

Queuing

Queuing at the project driveway was analyzed for the 95th percentile queue length. Under the Existing Weekday plus Project and Existing Weekend plus Project scenarios, the projected 95th percentile queues for right- and left-turning traffic was determined using a methodology published in *Highway Capacity Manual* (HCM*) 6th Edition*, Transportation Research Board, 2018. During the Saturday p.m. peak hour, which represents the worst-case condition, the 95th percentile queue length was determined to be one car length or 20 feet turning left onto the project site. As the *Highway Design Manual*, Caltrans, requires a minimum of 50 feet of stacking, the design of the proposed left-turn lane would accommodate the anticipated single-vehicle queue. Copies of the queuing estimates are included in Appendix E.

Finding – The left-turn lane that would be created by the project is of adequate length to accommodate anticipated queuing, so the impact is considered less-than-significant.

Significance Finding – The project would be expected to have a less-than-significant impact on safety issues.

Emergency Access

The final transportation bullet on the CEQA checklist requires an evaluation as to whether the project would result in inadequate emergency access or not.

Adequacy of Site Access

As proposed in the most recent site plan, the driveway would be 25 feet wide which is of sufficient width to accommodate emergency response vehicles. Further, emergency response vehicles would be able to use the service road and turn around in the loading area if necessary. As the site would be designed to accommodate truck traffic, site circulation would similarly accommodate fire trucks.

Emergency Response

The limited amount of traffic that would be added to SR 12-121 due to the project would reasonably be expected to have a nominal effect on emergency response times as all drivers must yield the right-of-way to emergency responders operating their lights and sirens. Under such circumstances the project would reasonably be expected to have no impact.

Finding – Emergency access would be adequate and the project would have no impact on emergency response times.

Significance Finding – The project would be expected to have a less-than-significant impact on emergency response and access.

Capacity Analysis

Intersection Level of Service Methodologies

Level of Service (LOS) is used to rank traffic operation on various types of facilities based on traffic volumes and roadway capacity using a series of letter designations ranging from A to F. Generally, Level of Service A represents free flow conditions and Level of Service F represents forced flow or breakdown conditions. A unit of measure that indicates a level of delay generally accompanies the LOS designation.

The study intersections were analyzed using the Signalized methodology published in the *HCM,* 6th Edition. This source contains methodologies for various types of intersection control, all of which are related to a measurement of delay in average number of seconds per vehicle. The signalized methodology is based on factors including traffic volumes, green time for each movement, phasing, whether the signals are coordinated or not, truck traffic, and pedestrian activity. Average stopped delay per vehicle in seconds is used as the basis for evaluation in this LOS methodology. For purposes of this study, delays were calculated using optimized signal timing.

The ranges of delay associated with the various levels of service are indicated in Table 5.

Table 5 – Signalized Intersection Level of Service Criteria	
LOS A	Delay of 0 to 10 seconds. Most vehicles arrive during the green phase, so do not stop at all.
LOS B	Delay of 10 to 20 seconds. More vehicles stop than with LOS A, but many drivers still do not have to stop.
LOS C	Delay of 20 to 35 seconds. The number of vehicles stopping is significant, although many still pass through without stopping.
LOS D	Delay of 35 to 55 seconds. The influence of congestion is noticeable, and most vehicles have to stop.
LOS E	Delay of 55 to 80 seconds. Most, if not all, vehicles must stop and drivers consider the delay excessive.
LOS F	Delay of more than 80 seconds. Vehicles may wait through more than one cycle to clear the intersection.

Reference: *Highway Capacity Manual 6th Edition*, Transportation Research Board, 2016

Traffic Operation Standards

Caltrans

Although both study intersections and the roadway fronting the project site are under the jurisdiction of Caltrans, Caltrans does not have a standard of significance relative to operation as this is no longer a CEQA issue. The new *Vehicle Miles Traveled-Focused Transportation Impact Study Guide* (TISG), published in May 2020, replaced the *Guide for the Preparation of Traffic Impact Studies*, 2002. As indicated in the TISG, the Department is transitioning away from requesting LOS or other vehicle operations analyses of land use projects and will instead focus on Vehicle Miles Traveled (VMT). Adequacy of operation was therefore evaluated using the County's standards.

Napa County

In the Circulation Element of the *Napa County General Plan*, the following policies have been adopted:

- **Policy CIR-31** – The County seeks to provide a roadway system that maintains current roadway capacities in most locations and is efficient in providing local access.
- **Policy CIR-38** – The County seeks to maintain operations of roads and intersections in the unincorporated County area that minimize travel delays and promote safe access for all users. Operational analysis shall be conducted according to the latest version of the Highway Capacity Manual and as described in the current version of the County's *Traffic Impact Study Guidelines*. In general, the County seeks to maintain Level of Service (LOS) D on arterial roadways and at signalized intersections, as the service level that best aligns with the County's desire to balance its rural character with the needs of supporting economic vitality and growth.

In situations where the County determines that achieving LOS D would cause an unacceptable conflict with other goals and objectives, minimizing collisions and the adequacy of local access will be the County's priorities. Mitigating operational impacts should first focus on reducing the project's vehicular trips through modifying the project definition, applying TDM strategies, and/or applying new technologies that could reduce vehicular travel and associated delays; then secondarily should consider physical infrastructure changes. Proposed mitigations will be evaluated for their effect on collisions and local access, and for their effectiveness in achieving the maximum potential reduction in the project's operational impacts (see the County's Transportation Impact Study Guidelines for a list of potential mitigation measures).

The following roadway segments are exceptions to the LOS D standard described above:

- State Route 29 in the unincorporated areas between Yountville and Calistoga: LOS F is acceptable.
- Silverado Trail between State Route 128 and Yountville Cross Road: LOS E is acceptable.
- State Route 12/121 between the Napa/Sonoma County line and Carneros Junction: LOS F is acceptable.
- American Canyon Road from I-80 to American Canyon City Limit: LOS E is acceptable.

To provide a more quantitative method of adhering to the above standards, the County refers to *Guidelines for Interpretation of General Plan Circulation Policies on Significance Criteria* (Fehr & Peers, 2015). The document establishes thresholds of significance for road segments and different intersection control types. The memorandum states a project would cause an adverse effect requiring mitigation if, for existing conditions:

- A signalized intersection operates at LOS A, B, C, or D during the selected peak hours without Project trips, and the LOS deteriorates to LOS E or F with the addition of Project trips; or
- A signalized intersection operates at LOS E or F during the selected peak hours without Project trips, and the addition of Project trips increases the total entering volume by one percent or more.
  - *Project Contribution % = Project Trips ÷ Existing Volumes*
- An unsignalized intersection operates at LOS A, B, C, or D during the selected peak hours without Project trips, and the LOS deteriorates to LOS E or F with the addition of Project traffic; the peak hour traffic signal warrant criteria should also be evaluated and presented for informational purposes; or
- An unsignalized intersection operates at LOS E or F during the selected peak hours without Project trips, and the project contributes one percent or more of the total entering traffic for all-way stop-controlled intersections, or ten percent or more of the traffic on a side-street approach for side-street

stop-controlled intersections; the peak hour traffic signal criteria should also be evaluated and presented for informational purposes. Both of those volumes are for the stop-controlled approaches only. Each stop-controlled approach that operates at LOS E or F should be analyzed individually.
    - *All-Way Stop-Controlled Intersections – The following equation should be used if the all-way stop-controlled intersection operates at LOS E or F without the Project:*
        - *Project Contribution % = Project Trips ÷ Existing Volumes*
    - *Side-Street Stop-Controlled Intersections – The following equation should be used if the side-street stop-controlled intersection operates at LOS E or F without the Project:*
        - *Project Contribution % = Project Trips ÷ Existing Volumes*
- An arterial segment operates at LOS A, B, C or D during the selected peak hours without Project trips, and deteriorates to LOS E or F with the addition of Project trips; or
- An arterial segment operates at LOS E or F during the selected peak hours without Project trips, and the addition of Project trips increases the total segment volume by one percent or more. The following equation should be used if the arterial segment operates at LOS E or F without the Project:
    - *Project Contribution % = Project Trips ÷ Existing Volumes*

Further, a project would cause an adverse effect requiring mitigation if, for cumulative (future) conditions, the Project's volume is equal to, or greater than five percent of the difference between cumulative (future) and existing volumes.

- Cumulative Conditions – A Project's contribution to a cumulative condition would be calculated as the Project's percentage contribution to the total growth in traffic. This calculation applies to arterials, signalized intersections, and unsignalized intersections.
    - *Project Contribution % = Project Trips ÷ (Cumulative Volumes – Existing Volumes)*

Significance threshold for failing intersections: General Plan policy accepts LOS E and F in certain instances. If an unsignalized intersection is operating acceptably (LOS A through LOS D), and the project would cause the intersection to fall to LOS E or LOS F, the applicant must mitigate the effect to restore to LOS D at minimum, or the project is considered to adversely affect the intersection. If an intersection is already LOS E or LOS F, and the project would increase delay by five or more seconds, the applicant must mitigate the effect to lower the increase in delay, or else the project would be considered to adversely affect the intersection. The same standards apply to the analysis of minor approaches to unsignalized intersections. As CEQA Guidelines shift away from LOS and toward VMT as the determining factor in identifying significant transportation impacts, adverse effects to intersections may still be the basis for conditioning transportation improvements to improve or maintain existing LOS or denying a project for the project's potentially negative effect to public safety (use permit finding).

It is noted that LOS F is acceptable under this policy for both study intersections and SR 12-121.

Existing Conditions

The Existing Conditions scenario provides an evaluation of current operation based on existing traffic volumes during the Friday p.m. and Saturday p.m. peak periods. This condition does not include project-generated traffic volumes. Volume data was collected at SR 12-121/Old Sonoma Road during harvest on October 7 and 8, 2022, and on December 9, and 17, 2022, at SR 12-121/SR 29. Both counts occurred while local schools were in session.

Under Existing Conditions, both intersections operate acceptably at LOS C or better. The existing traffic volumes are shown in Figure 1. A summary of the intersection Level of Service calculations is contained in Table 6, and copies of the calculations are provided in Appendix F.

Table 6 – Existing Peak Hour Intersection Levels of Service

Study Intersection	Friday PM Peak		Saturday PM Peak	
	Delay	LOS	Delay	LOS
1. SR 12-121/Old Sonoma Rd	28.0	C	30.3	C
2. SR 12-121/SR 29	17.9	B	20.4	C

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service

Future Conditions

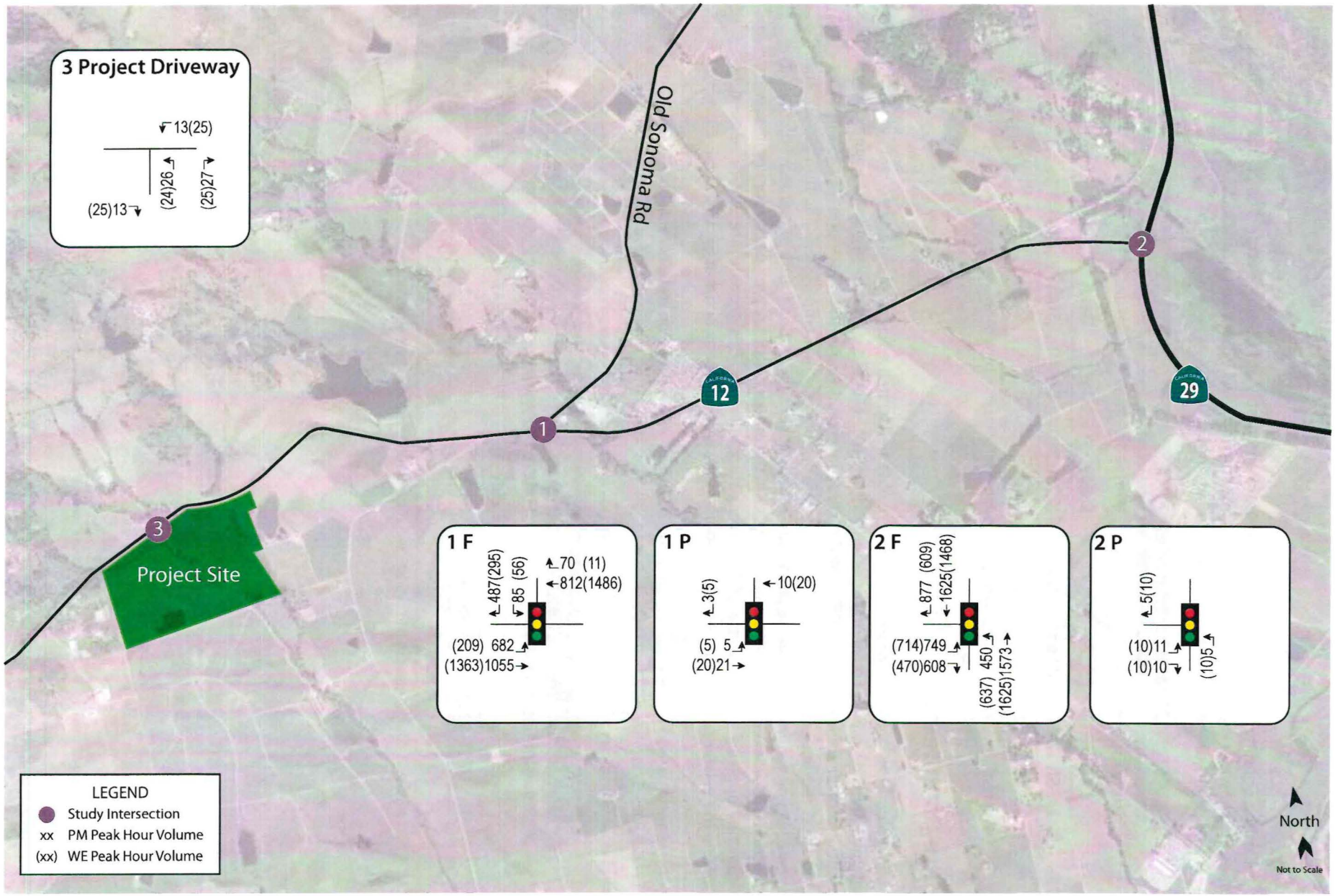
Segment volumes for the horizon year of 2040 were obtained from the Napa Solano Travel Demand model maintained by the Solano Transportation Authority (STA). Model-generated segment volumes were translated to turning movement volumes at the study intersections for the Friday p.m. peak hour using the "Furness" method. The Furness method is an iterative process that employs existing turn movement data, existing link volumes, and future link volumes to project likely turning future movement volumes at intersections. As weekend volumes are not available in the model, Saturday p.m. peak hour volumes were estimated by applying a growth rate of 1.22 to existing volumes. This growth rate was developed by comparing the existing and calculated future volumes for weekday peak hours at SR 12-121/SR 29.

Under the anticipated Future volumes, SR 12-121/SR 29 is expected to operate acceptably at LOS D and SR 12-121/Old Sonoma Road at LOS F based on the standards applied. Operating conditions are summarized in Table 7 and future volumes are shown in Figure 3.

Table 7 – Future Peak Hour Intersection Levels of Service

Study Intersection	Friday PM Peak		Saturday PM Peak	
	Delay	LOS	Delay	LOS
1. SR 12-121/Old Sonoma Rd	68.2	E	96.1	F
2. SR 12-121/SR 29	38.3	D	38.0	D

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service



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Transportation Impact Study for the Nights in White Satin Winery Project

Figure 3 – Future Traffic Volumes and Project Traffic Volumes

Project Conditions

Existing plus Project Conditions

Upon the addition of project-related traffic to the existing volumes, the study intersections are expected to operate acceptably. These results are summarized in Table 8 along with results for conditions without the project for ease of comparison. Project traffic volumes are shown in Figure 3 and Existing plus Project volumes in Figure 4.

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

Study Intersection	Existing Conditions				Existing plus Project			
	Friday		Saturday		Friday		Saturday	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1. SR 12-121/Old Sonoma Rd	28.0	C	30.3	C	29.3	C	33.5	C
2. SR 12-121/SR 29	17.9	B	20.4	C	18.3	B	21.0	C

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service

Finding – The study intersections are expected to continue operating acceptably at the same Levels of Service upon the addition of project-generated traffic to existing volumes as without the project.

Future plus Project Conditions

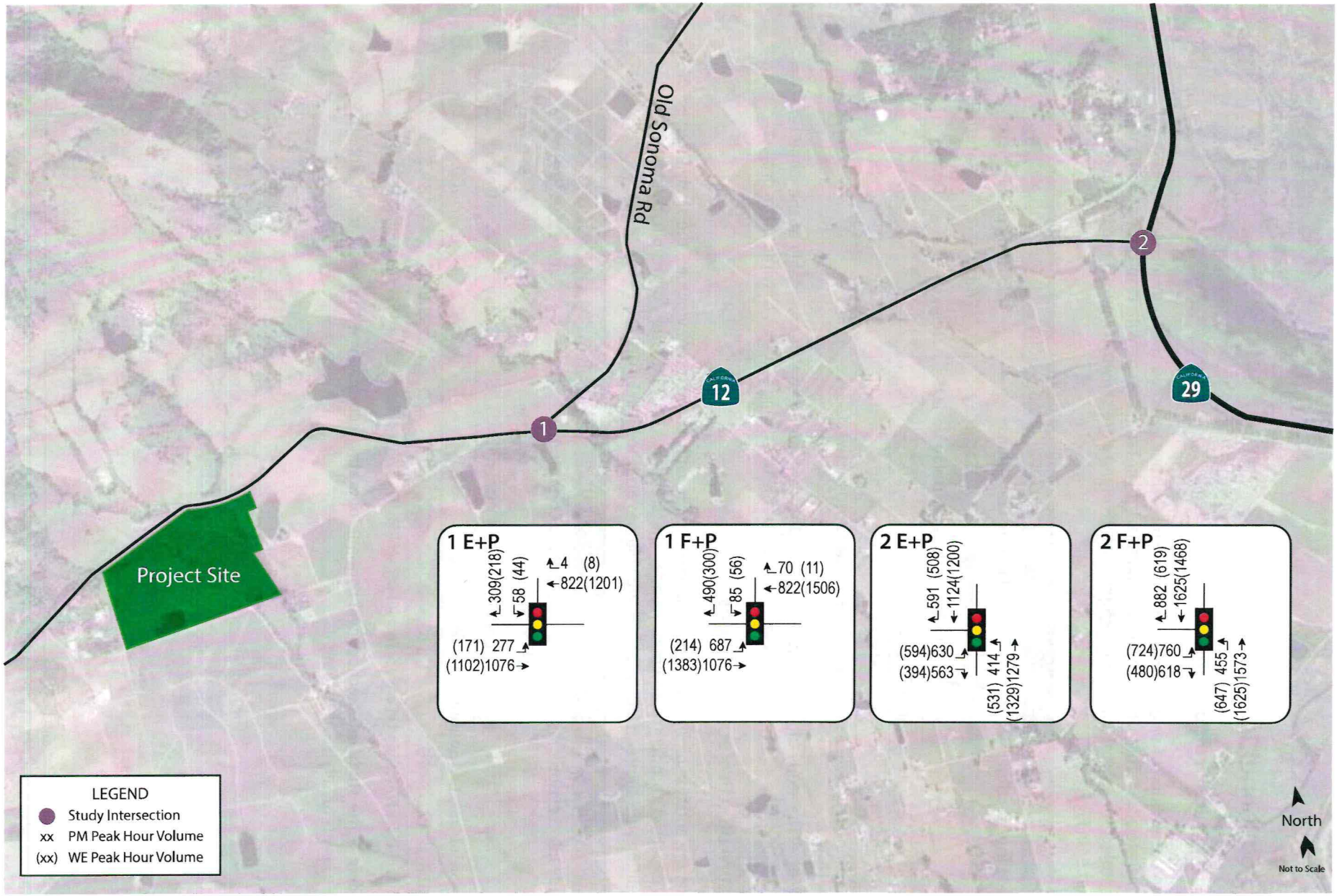
Upon the addition of project-generated traffic to the anticipated future volumes, the study intersections are expected to operate acceptably under the standards applied. The Future plus Project operating conditions are summarized in Table 9 and volumes are shown in Figure 4.

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

Study Intersection	Future Conditions				Future plus Project			
	Friday		Saturday		Friday		Saturday	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1. SR 12-121/Old Sonoma Rd	68.2	E	96.1	F	70.2	E	100.8	F
2. SR 12-121/SR 29	38.3	D	38.0	D	39.6	D	39.5	D

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; ** = delay greater than 120 seconds

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



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Transportation Impact Study for the Nights in White Satin Winery Project

Figure 4 – Existing plus Project Traffic Volumes and Future plus Project Traffic Volumes

Parking

The project was analyzed to determine whether the proposed parking supply would be sufficient for the anticipated daily demand during harvest conditions as well as during events. The project site, as proposed, would have 50 parking spaces, 16 of which would be reserved for employees and 34 for visitors as well as 39 overflow parking spaces along its visitor driveway. The location for overflow parking is identified in Plate 1.

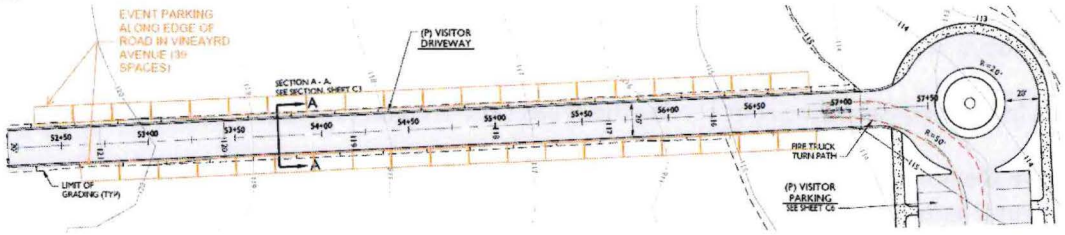

Plate 1 Location of 39 overflow parking spaces

To accommodate the daily parking demand for the tasting room, there should be at least one space provided for every employee on-site, as well as parking stalls for about 25 percent of the expected daily tasting room visitors. During harvest operations there would be 25 full-time and 10 part-time employees and a maximum of 150 visitors per day to the tasting room. Assuming the County's standard occupancy rate of 2.8 guests per vehicle, a total of 54 guest vehicles would require parking over the course of the day. Therefore, the proposed project would need at least 49 parking spaces, including 35 for employees and 14 for guests, assuming one-quarter of the guests would be there at any one time. The proposed supply of 50 spaces would be sufficient to accommodate the approximate peak demand of 49 spaces with a surplus of one space if employees are allowed to use visitor spaces.

The maximum number of parking spaces that would be needed on-site to accommodate employees and visitors during a 150-person marketing event was also estimated using the County's standard vehicle occupancies of one employee or 2.8 visitors per vehicle. Based on these operational parameters, during a 150-person event, a total of 89 parking spaces would be needed, including 54 for event guests and 35 for winery employees. Therefore, the total parking supply at the winery is insufficient to meet the anticipated parking demand for the largest event, experiencing a shortfall of 39 spaces. However, it is understood that the application includes a provision of 39 overflow parking spaces along the visitor driveway which will accommodate this shortfall.

The second largest event would be a 50-person event. Assuming staffing levels are maintained at the typical daily levels, the parking required for a 50-person event would be 57 spaces, including 18 for event guests, four for guests visiting the winery tasting room, and 35 for winery employees. Therefore, the proposed supply is deficient by seven spaces to meet the anticipated demand for 50-person events. The supply would, however, be adequate if the ten part-time staff were not on-site during such events or if seven of the proposed overflow parking spaces were used.

Finding – The proposed permanent parking supply is adequate for the anticipated demand during typical harvest operations and with overflow parking is adequate to meet the anticipated demand during events.

Recommendation – As proposed, the applicant should provide seven overflow parking spaces during 50-person events and 39 overflow parking spaces during events with 150 guests to ensure an adequate supply of parking.

Conclusions and Recommendations

Conclusions

- The project would result in a peak of 247 new trips on weekdays and 237 on weekends during harvest, including 79 new trips during the weekday p.m. peak hour and 99 during the Saturday p.m. peak hour. Under typical operation (non-harvest) the project would be expected to generate 217 daily trips on weekdays, including 70 peak hour trips, and 207 trips, with 88 peak hour trips, on a Saturday.
- The lack of pedestrian facilities serving the project site is consistent with County policy.
- There are no bicycle facilities near the project site. This is consistent with County policy considering the rural nature of the study area. The planned future provision of Class II bike lanes on SR 12-121 will improve bicycle access. As proposed, the project would not conflict with these plans though adequate right-of-way should be retained for the future installation of this facility.
- Though there are no transit facilities serving the project site, there is not expected to be any demand due to both the rural location and type of project. The project does not conflict with any policies relative to transit.
- With the implementation of TDM measures, the project would have a less-than-significant impact with respect to VMT.
- The segment of SR12-121 along the project frontage has above-average collision and injury rates, but the provision of a left-turn lane, as proposed as part of the project, will address the potential for the project to contribute to the primary collision type of rear-ends.
- Sight distances from the proposed driveway location are adequate.
- A left-turn lane from SR 12-121 to the driveway is warranted and proposed as part of the project. A right-turn lane and taper are not warranted, but the existing eight-foot shoulder can serve the function of a right-turn taper as needed. Acceleration lanes for exiting movements do not appear to be warranted.
- The length of the proposed left-turn lane at the project driveway will be adequate to accommodate the expected maximum queue.
- The project would have a less-than significant impact on emergency response and would provide adequate site circulation for emergency responders.
- The study intersections operate at acceptable Levels of Service under existing volumes and are expected to continue doing so under future volumes, without and with traffic generated by the project. The project would not have an adverse effect on future operation as the increase in volumes is less than 5 percent.
- The project as proposed would have adequate parking for daily operations during harvest but a shortfall of 39 spaces for the planned 150-person event. Parking would be adequate for a 50-person

event provided staff on-site simultaneously is limited to 25 persons or 39 overflow parking spaces are provided.

Recommendations

- The proposed frontage improvements should be coordinated with the County to ensure that there will be adequate right-of-way remaining for the planned future bike lane on SR 12-121. Additional right-of-way should be dedicated, if appropriate.
- As proposed, the applicant should provide overflow parking during events with 150 guests.
- The project should implement a TDM plan with the specified elements, including an annual monitoring report per County requirements.
- To preserve existing sight lines, any new signage, monuments, or other structures installed as part of the project should be positioned outside of the vision triangles of a driver waiting on the project driveway. Landscaping planted in the vision triangle should be low-lying or above four feet and maintained to remain outside the area needed for adequate sight lines.

Study Participants and References

Study Participants

Principal in Charge	Dalene J. Whitlock, PE, PTOE
Transportation Planner	Zack Matley, AICP
Traffic Engineer	Kevin Carstens, PE
Assistant Engineer	William Andrews, EIT
Graphics	Cameron Wong
Editing/Formatting	Jessica Bender
Quality Control	Dalene J. Whitlock, PE, PTOE

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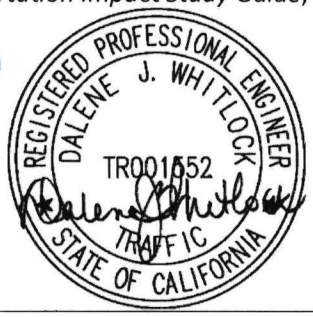


Appendix A

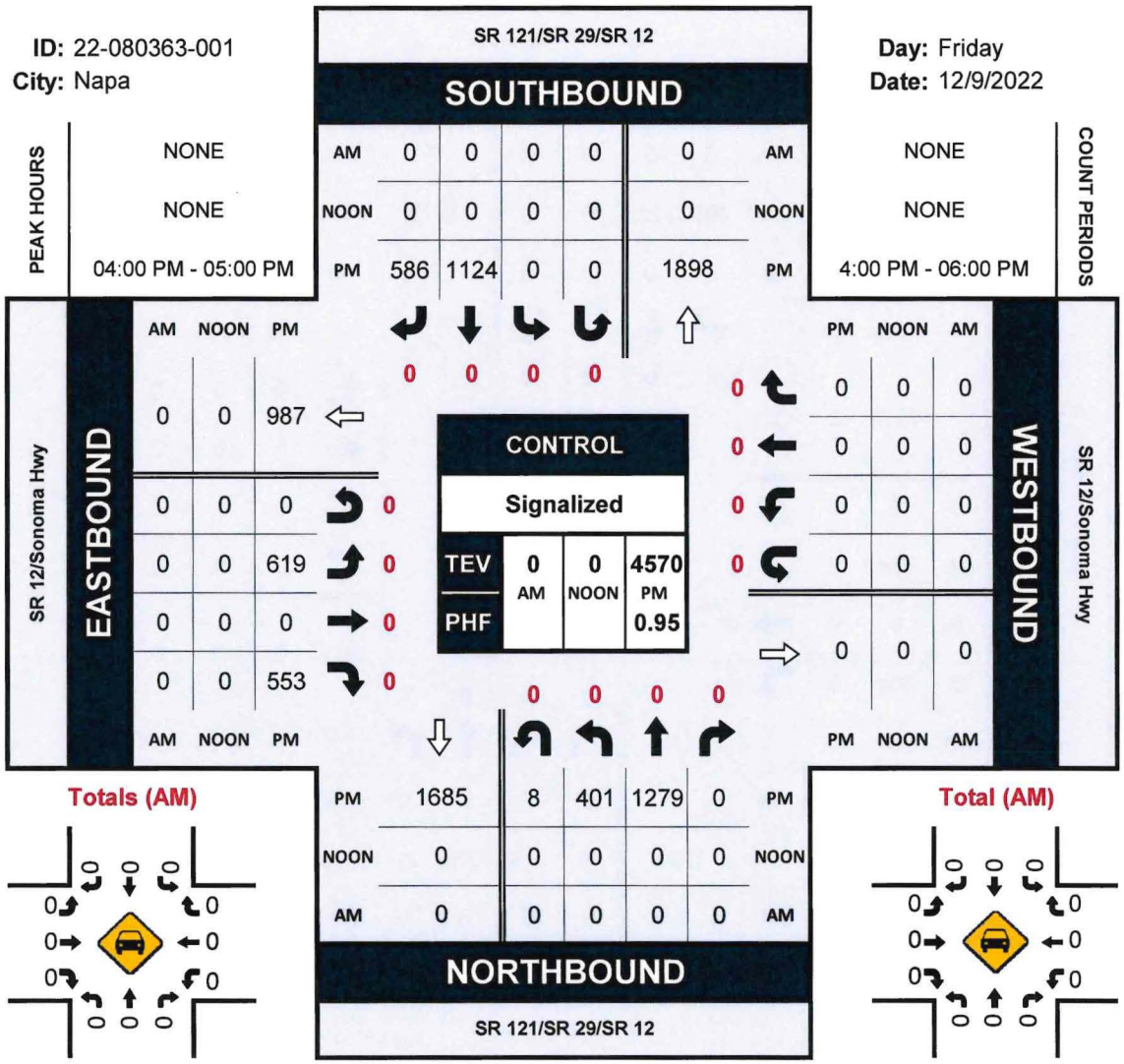
Traffic Counts


W-Trans

Prepared by National Data & Surveying Services

SR 121/SR 29/SR 12 & SR 12/Sonoma Hwy

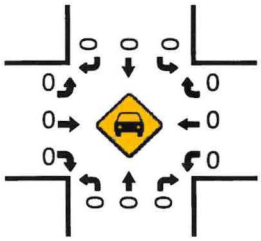
Peak Hour Turning Movement Count



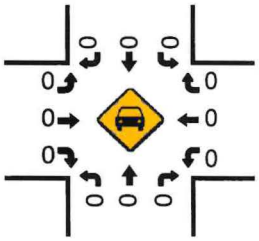
Totals (AM)

Total (AM)

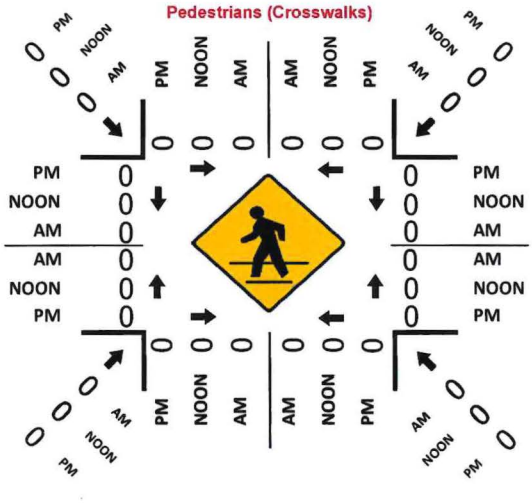
Totals (NOON)



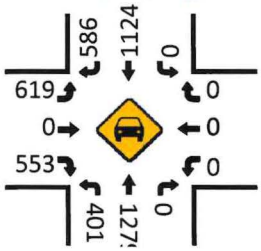
Total (NOON)



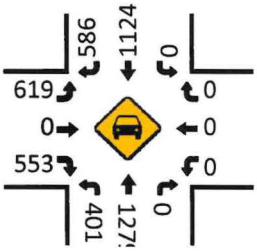
Pedestrians (Crosswalks)



Totals (PM)



Total (PM)



Prepared by National Data & Surveying Services

SR 121/SR 29/SR 12 & SR 12/Sonoma Hwy

Peak Hour Turning Movement Count

ID: 22-080363-001
City: Napa

Day: Saturday
Date: 12/17/2022

PEAK HOURS

AM	NOON	PM
NONE	01:45 PM - 02:45 PM	NONE

COUNT PERIODS

AM	NOON	PM
NONE	1:00 PM - 03:00 PM	NONE

CONTROL: Signalized

	AM	NOON	PM
TEV	0	4516	0
PHF		0.96	

SOUTHBOUND — SR 121/SR 29/SR 12

AM	0	0	0	0	0	AM
NOON	498	1200	0	0	1913	NOON
PM	0	0	0	0	0	PM

EASTBOUND — SR 12/Sonoma Hwy

AM	NOON	PM	
0	1012	0	⇦
0	0	0	↰ 0
0	584	0	↑ 0
0	0	0	→ 0
0	384	0	↱ 0

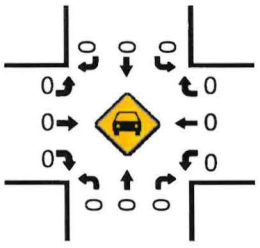
WESTBOUND — SR 12/Sonoma Hwy

PM	NOON	AM	
0	0	0	0 ↱
0	0	0	0 ←
0	0	0	0 ↰
0	0	0	0 ↰
0	0	0	⇨

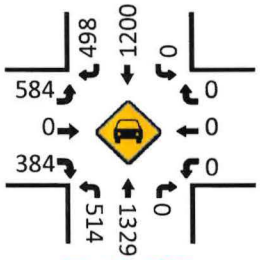
NORTHBOUND — SR 121/SR 29/SR 12

PM	0	0	0	0	0	PM
NOON	1591	7	514	1329	0	NOON
AM	0	0	0	0	0	AM

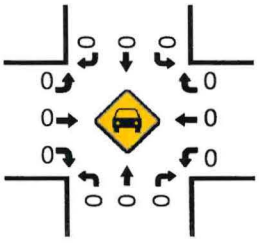
Totals (AM)



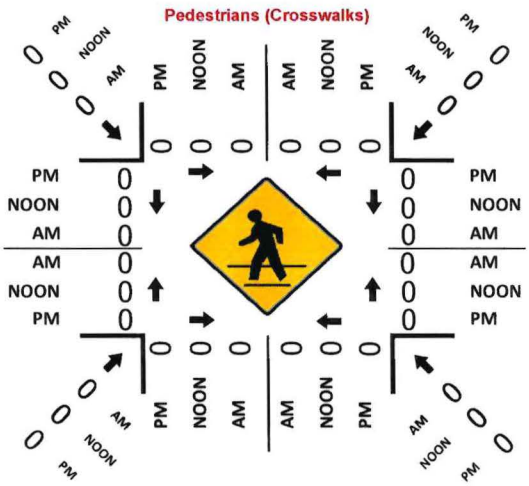
Totals (NOON)



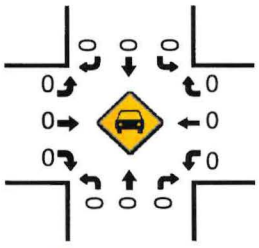
Totals (PM)



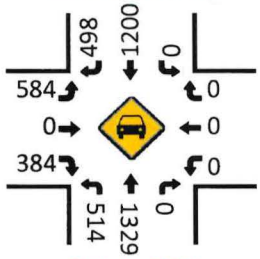
Pedestrians (Crosswalks)



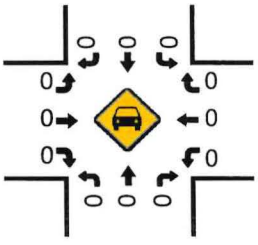
Totals (AM)



Totals (NOON)



Totals (PM)



National Data & Surveying Services Intersection Turning Movement Count

Location: SR 121/SR 29/SR 12 & SR 12/Sonoma Hwy
City: Napa
Control: Signalized

Project ID: 22-080363-001
Date: 12/9/2022

Data - Totals

NS/EW Streets:	SR 121/SR 29/SR 12				SR 121/SR 29/SR 12				SR 12/Sonoma Hwy				SR 12/Sonoma Hwy				
PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	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	99	319	0	1	0	316	158	0	141	0	171	0	0	0	0	0	1205
4:15 PM	112	297	0	2	0	289	145	0	154	0	144	0	0	0	0	0	1143
4:30 PM	102	350	0	1	0	286	132	0	160	0	134	0	0	0	0	0	1165
4:45 PM	88	313	0	4	0	233	151	0	164	0	104	0	0	0	0	0	1057
5:00 PM	108	335	0	0	0	236	146	0	127	0	137	0	0	0	0	0	1089
5:15 PM	107	333	0	0	0	264	143	0	165	0	115	0	0	0	0	0	1127
5:30 PM	68	290	0	1	0	291	153	0	157	0	140	0	0	0	0	0	1100
5:45 PM	95	268	0	3	0	286	122	0	133	0	134	0	0	0	0	0	1041
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	779	2505	0	12	0	2201	1150	0	1201	0	1079	0	0	0	0	0	8927
APPROACH %'s :	23.63%	76.00%	0.00%	0.36%	0.00%	65.68%	34.32%	0.00%	52.68%	0.00%	47.32%	0.00%					
PEAK HR :	04:00 PM - 05:00 PM																TOTAL
PEAK HR VOL :	401	1279	0	8	0	1124	586	0	619	0	553	0	0	0	0	0	4570
PEAK HR FACTOR :	0.895	0.914	0.000	0.500	0.000	0.889	0.927	0.000	0.944	0.000	0.808	0.000	0.000	0.000	0.000	0.000	0.948
	0.932				0.902				0.939								

National Data & Surveying Services Intersection Turning Movement Count

Location: SR 121/SR 29/SR 12 & SR 12/Sonoma Hwy
City: Napa
Control: Signalized

Project ID: 22-080363-001
Date: 12/17/2022

Data - Totals

NS/EW Streets:	SR 121/SR 29/SR 12				SR 121/SR 29/SR 12				SR 12/Sonoma Hwy				SR 12/Sonoma Hwy				
NOON	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
1:00 PM	104	350	0	1	0	273	106	0	155	0	94	0	0	0	0	0	1083
1:15 PM	97	297	0	0	0	285	122	0	152	0	118	0	0	0	0	0	1071
1:30 PM	130	352	0	5	0	260	133	0	146	0	110	0	0	0	0	0	1136
1:45 PM	166	359	0	2	0	263	116	0	145	0	76	0	0	0	0	0	1127
2:00 PM	129	313	0	2	0	299	134	0	131	0	97	0	0	0	0	0	1105
2:15 PM	101	331	0	1	0	300	123	0	148	0	109	0	0	0	0	0	1113
2:30 PM	118	326	0	2	0	338	125	0	160	0	102	0	0	0	0	0	1171
2:45 PM	112	297	0	1	0	302	128	0	158	0	113	0	0	0	0	0	1111
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	957	2625	0	14	0	2320	987	0	1195	0	819	0	0	0	0	0	8917
APPROACH %'s :	26.61%	73.00%	0.00%	0.39%	0.00%	70.15%	29.85%	0.00%	59.33%	0.00%	40.67%	0.00%					
PEAK HR :	01:45 PM - 02:45 PM																TOTAL
PEAK HR VOL :	514	1329	0	7	0	1200	498	0	584	0	384	0	0	0	0	0	4516
PEAK HR FACTOR :	0.774	0.925	0.000	0.875	0.000	0.888	0.929	0.000	0.913	0.000	0.881	0.000	0.000	0.000	0.000	0.000	0.964
	0.878				0.917				0.924								

National Data & Surveying Services Intersection Turning Movement Count

Location: SR 121/SR 29/SR 12 & SR 12/Sonoma Hwy
City: Napa
Control: Signalized

Project ID: 22-080363-001
Date: 12/9/2022

Data - RTOR

NS/EW Streets:	SR 121/SR 29/SR 12				SR 121/SR 29/SR 12				SR 12/Sonoma Hwy				SR 12/Sonoma Hwy				
PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	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	0	0	0	0	0	0	18	0	0	0	0	0	0	0	0	0	18
4:15 PM	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	8
4:30 PM	0	0	0	0	0	0	19	0	0	0	0	0	0	0	0	0	19
4:45 PM	0	0	0	0	0	0	15	0	0	0	0	0	0	0	0	0	15
5:00 PM	0	0	0	0	0	0	12	0	0	0	0	0	0	0	0	0	12
5:15 PM	0	0	0	0	0	0	9	0	0	0	0	0	0	0	0	0	9
5:30 PM	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	8
5:45 PM	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	8
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	97	0	0	0	0	0	0	0	0	0	97
APPROACH %'s :					0.00%	0.00%	100.00%	0.00%									
PEAK HR :	04:00 PM - 05:00 PM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	60	0	0	0	0	0	0	0	0	0	60
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.000	0.000	0.789	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.789
					0.789												

National Data & Surveying Services Intersection Turning Movement Count

Location: SR 121/SR 29/SR 12 & SR 12/Sonoma Hwy
City: Napa
Control: Signalized

Project ID: 22-080363-001
Date: 12/17/2022

Data - RTOR

NS/EW Streets:	SR 121/SR 29/SR 12				SR 121/SR 29/SR 12				SR 12/Sonoma Hwy				SR 12/Sonoma Hwy				
NOON	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
1:00 PM	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	10
1:15 PM	0	0	0	0	0	0	12	0	0	0	0	0	0	0	0	0	12
1:30 PM	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	6
1:45 PM	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	7
2:00 PM	0	0	0	0	0	0	13	0	0	0	0	0	0	0	0	0	13
2:15 PM	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	7
2:30 PM	0	0	0	0	0	0	12	0	0	0	0	0	0	0	0	0	12
2:45 PM	0	0	0	0	0	0	14	0	0	0	0	0	0	0	0	0	14
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	0	0	81	0	0	0	0	0	0	0	0	0	81
APPROACH %'s :					0.00%	0.00%	100.00%	0.00%									
PEAK HR :	01:45 PM - 02:45 PM																TOTAL
PEAK HR VOL :	0	0	0	0	0	0	39	0	0	0	0	0	0	0	0	0	39
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.000	0.000	0.750	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.750
					0.750												

Traffic Volumes Counts

Dist	Cnty	Rte	PM	Leg	Dir	Description	Date	Day	24 hour Period Hourly Counts																											24hr total
									0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20	20-21	21-22	22-23	23-24				
	4	SON	121	7.442	A	N	JCT. RTE. 12 NORTH	09/19/2020	SAT	45	A	26	A	31	A	42	A	62	A	240	A	515	A	553	A	542	A	542	A	527	A	605	A	671	A	687	A	734	A	656	A	694	A	748	A	722	A	421	A	256	A	160	A	102	A	80	A	9,661
	4	SON	121	7.442	A	N	JCT. RTE. 12 NORTH	09/18/2020	FRI	39	A	37	A	27	A	45	A	70	A	248	A	475	A	618	A	575	A	466	A	513	A	575	A	557	A	622	A	647	A	650	A	651	A	710	A	644	A	379	A	243	A	137	A	80	A	75	A	9,083
	4	SON	121	7.442	A	N	JCT. RTE. 12 NORTH	09/09/2017	SAT	72	A	53	A	57	A	47	A	65	A	123	A	235	A	412	A	532	A	637	A	810	A	891	A	887	A	772	A	848	A	765	A	769	A	723	A	710	A	493	A	380	A	285	A	243	A	149	A	10,978
	4	SON	121	7.442	A	N	JCT. RTE. 12 NORTH	09/08/2017	FRI	58	A	63	A	38	A	53	A	110	A	246	A	527	A	755	A	783	A	737	A	748	A	790	A	830	A	803	A	868	A	795	A	774	A	796	A	904	A	644	A	459	A	285	A	209	A	133	A	12,388


W-Trans

Appendix B

Collision Rate Calculations


W-Trans

Roadway Segment Collision Rate Worksheet

Transportation Impact Study for White Satin Winery Project

Location: Project Driveway

Date of Count: Wednesday, December 14, 2022
Average Daily Traffic (ADT): 11,500

Number of Collisions: 55
Number of Injuries: 28
Number of Fatalities: 0
Start Date: June 1, 2017
End Date: May 31, 2022
Number of Years: 5

Highway Type: Conventional 2 lanes or less
Area: Rural
Design Speed: >55
Terrain: Flat
Segment Length: 1.0 miles
Direction: North/South

$$\text{Collision Rate} = \frac{\text{Number of Collisions} \times 1 \text{ Million}}{\text{ADT} \times \text{Days per Year} \times \text{Segment Length} \times \text{Number of Years}}$$

$$\text{Collision Rate} = \frac{55 \times 1{,}000{,}000}{11{,}500 \times 365 \times 1 \times 5}$$

	Collision Rate		Fatality Rate	Injury Rate
Study Segment	**2.62**	**c/mvm**	**0.0%**	**50.9%**
Statewide Average*	**0.70**	**c/mvm**	**3.2%**	**38.9%**

Notes

ADT = average daily traffic volume
c/mvm = collisions per million vehicle miles
* 2019 Collision Data on California State Highways, Caltrans


W-Trans

Appendix C

Trip Generation Worksheet


W-Trans

WINERY TRIP GENERATION WORKSHEET

Planning, Building & Environmental Services
1195 Third Street, Suite 210
Napa, CA 94559-3082
(707) 253-4417

A Tradition of Stewardship
A Commitment to Service

Clear Form

PROJECT DESCRIPTION

Winery Name: Nights in White Satin Winery **Date Prepared:** 10/1/21

Existing Entitled Winery		Harvest	Non-Harvest
Number of Full Time Employees*	Weekday	0	0
	Weekend	0	0
Number of Part Time Employees*	Weekday	0	0
	Weekend	0	0
Maximum Daily Visitation	Weekday	0	0
	Weekend	0	0
Annual Gallons of Production		0	0
Annual Tons of Grape Haul		0.0	N/A
Number of Visitors at the Largest Event that occurs two or more times per month, on average	Weekday	0	0
	Weekend	0	0

Proposed Winery		Harvest	Non-Harvest
Number of Full Time Employees*	Weekday	25	25
	Weekend	25	25
Number of Part Time Employees*	Weekday	10	0
	Weekend	10	0
Maximum Daily Visitation	Weekday	150	150
	Weekend	150	150
Annual Gallons of Production		120,000	120,000
Annual Tons of Grape Haul		750.0	N/A
Number of Visitors at the Largest Event that occurs two or more times per month, on average	Weekday	30	30
	Weekend	30	30

*Number of full time and part time employees should represent the max number of employees that will be working on any given day (including all vendors and contractors employed for the largest event that occurs two or more times per month on average).

Nights in White Satin Winery
TRIP GENERATION

Existing Winery					**Harvest**	**Non-Harvest**
Maximum Daily Weekday Traffic (Friday)						
	Harvest	*Non-Harvest*				
FT Employees	0	0	3.05 one way trips/employee	FT Employee Daily Trips	0.0	0.0
PT Employees	0	0	1.9 one way trips/employee	PT Employee Daily Trips	0.0	0.0
Max Visitors	0	0	2.6 visitors/vehicle for 2 one way trips	Max Visitor Daily Trips	0.0	0.0
Max Event	0	0	2.6 visitors/vehicle for 2 one way trips	Max Event Daily Trips	0.0	0.0
Gallons of Production	0		0.000018 truck trips	Production Daily Trips	0.0	0.0
Tons of Grape Haul#	0.0		0.013889 truck trips	Grape Haul Daily Trips	0.0	0.0
				Total Weekday Daily Trips	0	0
				Total Weekday Peak Hour Trips*	0	0
Maximum Daily Weekend Traffic (Saturday)						
	Harvest	*Non-Harvest*				
FT Employees	0	0	3.05 one way trips/employee	FT Employee Daily Trips	0.0	0.0
PT Employees	0	0	1.9 one way trips/employee	PT Employee Daily Trips	0.0	0.0
Max Visitors	0	0	2.8 visitors/vehicle for 2 one way trips	Max Visitor Daily Trips	0.0	0.0
Max Event	0	0	2.8 visitors/vehicle for 2 one way trips	Max Event Daily Trips	0.0	0.0
Gallons of Production	0		0.000018 truck trips	Production Daily Trips	0.0	0.0
Tons of Grape Haul#	0.0		0.013889 truck trips	Grape Haul Daily Trips	0.0	0.0
				Total Weekend Daily Trips	0	0
				Total Weekend Peak Hour Trips*	0	0
Maximum Annual Traffic						
				Total Annual Trips**	0	

Proposed Winery					**Harvest**	**Non-Harvest**
Maximum Daily Weekday Traffic (Friday)						
	Harvest	*Non-Harvest*				
FT Employees	25	25	3.05 one way trips/employee	FT Employee Daily Trips	76.3	76.3
PT Employees	10	0	1.9 one way trips/employee	PT Employee Daily Trips	19.0	0.0
Max Visitors	150	150	2.6 visitors/vehicle for 2 one way trips	Max Visitor Daily Trips	115.4	115.4
Max Event	30	30	2.6 visitors/vehicle for 2 one way trips	Max Event Daily Trips	23.1	23.1
Gallons of Production	120,000		0.000018 truck trips	Production Daily Trips	2.2	2.2
Tons of Grape Haul#	750.0		0.013889 truck trips	Grape Haul Daily Trips	10.4	0.0
				Total Weekday Daily Trips	247	217
				Total Weekday Peak Hour Trips*	79	70
Maximum Daily Weekend Traffic (Saturday)						
	Harvest	*Non-Harvest*				
FT Employees	25	25	3.05 one way trips/employee	FT Employee Daily Trips	76.3	76.3
PT Employees	10	0	1.9 one way trips/employee	PT Employee Daily Trips	19.0	0.0
Max Visitors	150	150	2.8 visitors/vehicle for 2 one way trips	Max Visitor Daily Trips	107.1	107.1
Max Event	30	30	2.8 visitors/vehicle for 2 one way trips	Max Event Daily Trips	21.4	21.4
Gallons of Production	120,000		0.000018 truck trips	Production Daily Trips	2.2	2.2
Tons of Grape Haul#	750.0		0.013889 truck trips	Grape Haul Daily Trips	10.4	0.0
				Total Weekend Daily Trips	237	207
				Total Weekend Peak Hour Trips*	99	88
Maximum Annual Traffic						
				Total Annual Trips**	80,475	

Net New Trips			**Harvest**	**Non-Harvest**
Maximum Weekday Traffic (Friday)				
If total net new daily trips is greater than 40, a TIS is required		**Net New Weekday Daily Trips**	247	217
		Net New Weekday Peak Hour Trips*	79	70
Maximum Weekend Traffic (Saturday)				
If total net new daily trips is greater than 40, a TIS is required		**Net New Weekend Daily Trips**	237	207
		Net New Weekend Peak Hour Trips*	99	88
Maximum Annual Traffic	*Please Prepare a Traffic Impact Study*	**Net New Annual Trips****	80,475	

#Trips associated with Grape Haul represent harvest season only.

*Weekday peak hour trips are calculated as 38% of daily trips associated with visitors and production plus one trip per employee. Weekend peak hour trips are calculated as 57% of daily trips associated with visitors and production plus one trip per employee.

**Annual trips represent a conservative calculation that assumes 11 weeks of harvest, all weekdays are Fridays, all weekends are Saturdays, and assumes that the largest event that occurs two or more times per month on average occurs every day.

Appendix D

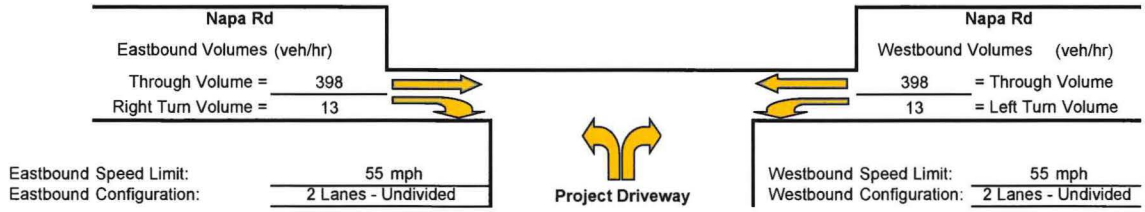
Turn-Lane Warrant Worksheet


W-Trans

Turn Lane Warrant Analysis - Tee Intersections

Study Intersection: SR 121-12 and Proposed Driveway
Study Scenario: Existing Weekday plus Project, 2017 Volumes

Direction of Analysis Street: East/West
Cross Street Intersects: From the South



Eastbound Speed Limit:	55 mph	Westbound Speed Limit:	55 mph
Eastbound Configuration:	2 Lanes - Undivided	Westbound Configuration:	2 Lanes - Undivided

Eastbound Right Turn Lane Warrants

1. Check for right turn volume criteria

NOT WARRANTED Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane

Advancing Volume Threshold	AV =	-
Advancing Volume	Va =	411
If AV<Va then warrant is met		-

Right Turn Lane Warranted: **NO**

Eastbound Right Turn Taper Warrants
(evaluate if right turn lane is unwarranted)

1. Check taper volume criteria

NOT WARRANTED - Less than 20 vehicles

2. Check advance volume threshold criteria for taper

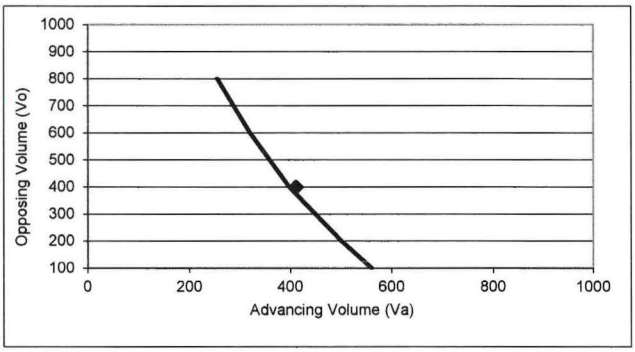
Advancing Volume Threshold	AV =	-
Advancing Volume	Va =	411
If AV<Va then warrant is met		-

Right Turn Taper Warranted: **NO**

Westbound Left Turn Lane Warrants

Percentage Left Turns %lt	3.2 %
Advancing Volume Threshold AV	399 veh/hr

If AV<Va then warrant is met



◆ Study Intersection
Two lane roadway warrant threshold for: 55 mph
Turn lane warranted if point falls to right of warrant threshold line

Left Turn Lane Warranted: **YES**

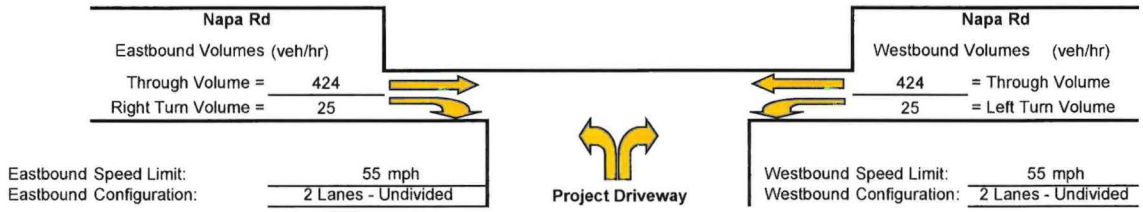
The right turn lane and taper analysis is based on work conducted by The Development of Criteria for the Treatment of Right Turn Movements on Rural Roads, Cottrell in 1981.

The left turn lane analysis uses a regression based on work conducted by M.D. Harmelink in 1967, as presented in the California Department of Transportation's Guide of Intersections (1985) and AASHTO's Policy on Geometric Design of Highways and Streets (7th ed.).

Turn Lane Warrant Analysis - Tee Intersections

Study Intersection: SR 121-12 and Proposed Driveway
Study Scenario: Existing Weekend plus Project, 2017 Volumes

Direction of Analysis Street: East/West
Cross Street Intersects: From the South



Eastbound Speed Limit: 55 mph
Eastbound Configuration: 2 Lanes - Undivided

Westbound Speed Limit: 55 mph
Westbound Configuration: 2 Lanes - Undivided

Eastbound Right Turn Lane Warrants

1. Check for right turn volume criteria

NOT WARRANTED Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane

Advancing Volume Threshold	AV =	-
Advancing Volume	Va =	449
If AV<Va then warrant is met		-

Right Turn Lane Warranted: NO

Eastbound Right Turn Taper Warrants
(evaluate if right turn lane is unwarranted)

1. Check taper volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for taper

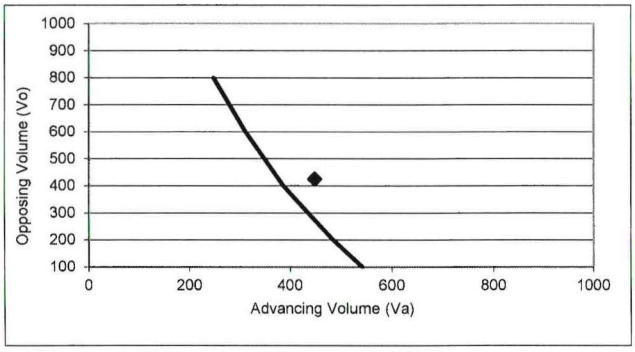
Advancing Volume Threshold	AV =	450
Advancing Volume	Va =	449
If AV<Va then warrant is met		No

Right Turn Taper Warranted: NO

Westbound Left Turn Lane Warrants

Percentage Left Turns %lt	5.6 %
Advancing Volume Threshold AV	377 veh/hr

If AV<Va then warrant is met



◆ Study Intersection
——— Two lane roadway warrant threshold for: 55 mph
Turn lane warranted if point falls to right of warrant threshold line

Left Turn Lane Warranted: YES

The right turn lane and taper analysis is based on work conducted by The Development of Criteria for the Treatment of Right Turn Movements on Rural Roads, Cottrell in 1981.

The left turn lane analysis uses a regression based on work conducted by M.D. Harmelink in 1967, as presented in the California Department of Transportation's Guide of Intersections (1985) and AASHTO's Policy on Geometric Design of Highways and Streets (7th ed.).

Turn Lane Warrant Analysis - Tee Intersections

Study Intersection: SR 121-12 and Proposed Driveway
Study Scenario: Existing Weekday plus Project, 2020 Volumes

Direction of Analysis Street: East/West

Cross Street Intersects: From the South

Napa Rd

Eastbound Volumes (veh/hr)

Through Volume = 355

Right Turn Volume = 13

Napa Rd

Westbound Volumes (veh/hr)

355 = Through Volume

13 = Left Turn Volume

Eastbound Speed Limit: 55 mph
Eastbound Configuration: 2 Lanes - Undivided

Project Driveway

Westbound Speed Limit: 55 mph
Westbound Configuration: 2 Lanes - Undivided

Eastbound Right Turn Lane Warrants

1. Check for right turn volume criteria

NOT WARRANTED Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane

Advancing Volume Threshold	AV =	-
Advancing Volume	Va =	368
If AV<Va then warrant is met		-

Right Turn Lane Warranted: **NO**

Eastbound Right Turn Taper Warrants
(evaluate if right turn lane is unwarranted)

1. Check taper volume criteria

NOT WARRANTED - Less than 20 vehicles

2. Check advance volume threshold criteria for taper

Advancing Volume Threshold	AV =	-
Advancing Volume	Va =	368
If AV<Va then warrant is met		-

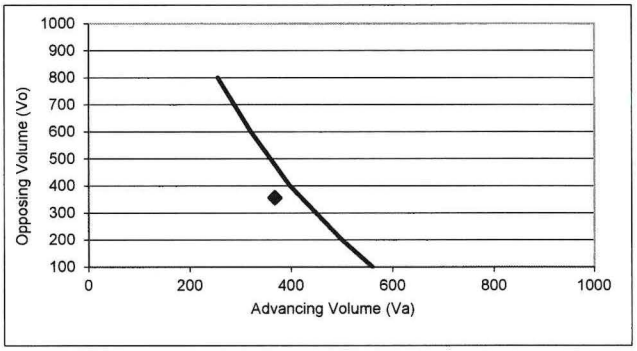
Right Turn Taper Warranted: **NO**

Westbound Left Turn Lane Warrants

Percentage Left Turns %lt 3.5 %

Advancing Volume Threshold AV 421 veh/hr

If AV<Va then warrant is met



◆ Study Intersection

Two lane roadway warrant threshold for: 55 mph

Turn lane warranted if point falls to right of warrant threshold line

Left Turn Lane Warranted: **NO**

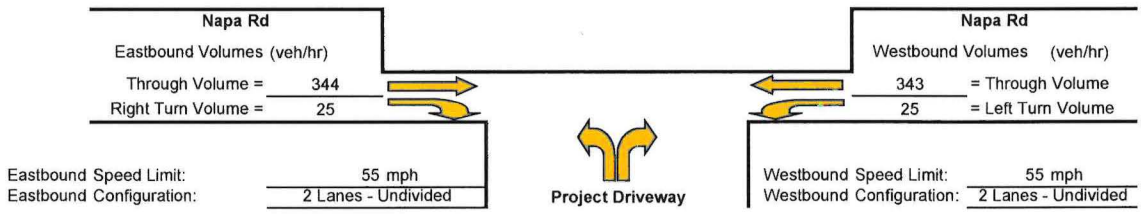
The right turn lane and taper analysis is based on work conducted by The Development of Criteria for the Treatment of Right Turn Movements on Rural Roads, Cottrell in 1981.

The left turn lane analysis uses a regression based on work conducted by M.D. Harmelink in 1967, as presented in the California Department of Transportation's Guide of Intersections (1985) and AASHTO's Policy on Geometric Design of Highways and Streets (7th ed.).

Turn Lane Warrant Analysis - Tee Intersections

Study Intersection: SR 121-12 and Proposed Driveway
Study Scenario: Existing Weekend plus Project, 2020 Volumes

Direction of Analysis Street: East/West
Cross Street Intersects: From the South



Eastbound Speed Limit:	55 mph
Eastbound Configuration:	2 Lanes - Undivided
Westbound Speed Limit:	55 mph
Westbound Configuration:	2 Lanes - Undivided

Eastbound Right Turn Lane Warrants

1. Check for right turn volume criteria

NOT WARRANTED Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane

Advancing Volume Threshold	AV =	-
Advancing Volume	Va =	369
If AV<Va then warrant is met		-

Right Turn Lane Warranted: **NO**

Eastbound Right Turn Taper Warrants
(evaluate if right turn lane is unwarranted)

1. Check taper volume criteria

Thresholds not met, continue to next step

2. Check advance volume threshold criteria for taper

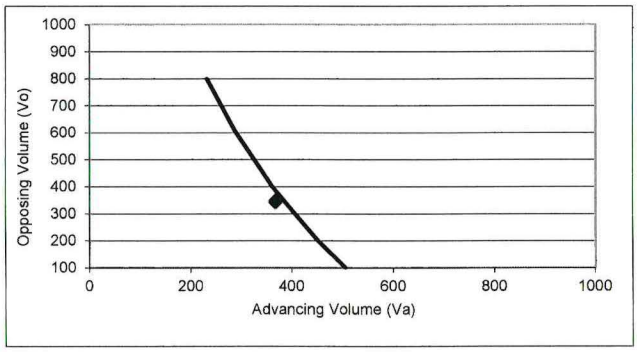
Advancing Volume Threshold	AV =	450
Advancing Volume	Va =	369
If AV<Va then warrant is met		No

Right Turn Taper Warranted: **NO**

Westbound Left Turn Lane Warrants

Percentage Left Turns %lt	6.8 %
Advancing Volume Threshold AV	386 veh/hr

If AV<Va then warrant is met



◆ Study Intersection
——— Two lane roadway warrant threshold for: 55 mph
Turn lane warranted if point falls to right of warrant threshold line

Left Turn Lane Warranted: **NO**

The right turn lane and taper analysis is based on work conducted by The Development of Criteria for the Treatment of Right Turn Movements on Rural Roads, Cottrell in 1981.

The left turn lane analysis uses a regression based on work conducted by M.D. Harmelink in 1967, as presented in the California Department of Transportation's Guide of Intersections (1985) and AASHTO's Policy on Geometric Design of Highways and Streets (7th ed.).

Appendix E

Queuing Calculations


W-Trans

Intersection	
Int Delay, s/veh	1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	393	9	9	393	26	26
Future Vol, veh/h	393	9	9	393	26	26
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	427	10	10	427	28	28

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	437	0	879	432
Stage 1	-	-	-	-	432	-
Stage 2	-	-	-	-	447	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1123	-	318	624
Stage 1	-	-	-	-	655	-
Stage 2	-	-	-	-	644	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1123	-	314	624
Mov Cap-2 Maneuver	-	-	-	-	314	-
Stage 1	-	-	-	-	655	-
Stage 2	-	-	-	-	636	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.2	15
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	418	-	-	1123	-
HCM Lane V/C Ratio	0.135	-	-	0.009	-
HCM Control Delay (s)	15	-	-	8.2	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.5	-	-	0	-

Intersection	
Int Delay, s/veh	1.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	424	25	25	424	25	24
Future Vol, veh/h	424	25	25	424	25	24
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	461	27	27	461	27	26

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	488	0	990	475
Stage 1	-	-	-	-	475	-
Stage 2	-	-	-	-	515	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1075	-	273	590
Stage 1	-	-	-	-	626	-
Stage 2	-	-	-	-	600	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1075	-	264	590
Mov Cap-2 Maneuver	-	-	-	-	264	-
Stage 1	-	-	-	-	626	-
Stage 2	-	-	-	-	580	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	16.7
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	362	-	-	1075	-
HCM Lane V/C Ratio	0.147	-	-	0.025	-
HCM Control Delay (s)	16.7	-	-	8.4	0
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.5	-	-	0.1	-


W-Trans

Appendix F

Intersection Level of Service Calculations


W-Trans

HCM 6th Signalized Intersection Summary
1: SR 12-121 & Old Sonoma Road

10/24/2023

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	272	1055	812	4	58	306
Future Volume (veh/h)	272	1055	812	4	58	306
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1900	1826	1826	1900	1900	1826
Adj Flow Rate, veh/h	280	1088	837	2	60	173
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	5	5	0	0	5
Cap, veh/h	283	1330	887	782	178	395
Arrive On Green	0.16	0.73	0.49	0.49	0.10	0.10
Sat Flow, veh/h	1810	1826	1826	1610	1810	1547
Grp Volume(v), veh/h	280	1088	837	2	60	173
Grp Sat Flow(s),veh/h/ln	1810	1826	1826	1610	1810	1547
Q Serve(g_s), s	12.5	32.4	35.3	0.1	2.5	7.6
Cycle Q Clear(g_c), s	12.5	32.4	35.3	0.1	2.5	7.6
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	283	1330	887	782	178	395
V/C Ratio(X)	0.99	0.82	0.94	0.00	0.34	0.44
Avail Cap(c_a), veh/h	335	1555	1059	934	380	567
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.1	7.4	19.8	10.7	34.0	25.3
Incr Delay (d2), s/veh	43.3	3.1	14.5	0.0	1.1	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.4	6.8	15.3	0.0	1.1	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	77.4	10.5	34.3	10.7	35.1	26.1
LnGrp LOS	E	B	C	B	D	C
Approach Vol, veh/h		1368	839		233	
Approach Delay, s/veh		24.2	34.2		28.4	
Approach LOS		C	C		C	

Timer - Assigned Phs				4		6	7	8
Phs Duration (G+Y+Rc), s				66.0		15.0	19.7	46.4
Change Period (Y+Rc), s				4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s				72.0		20.0	18.0	50.0
Max Q Clear Time (g_c+I1), s				35.4		10.6	15.5	38.3
Green Ext Time (p_c), s				10.0		0.4	0.2	4.1

Intersection Summary	
HCM 6th Ctrl Delay	28.0
HCM 6th LOS	C

HCM 6th Signalized Intersection Summary
2: SR 29 & SR 12-121

10/24/2023

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	619	553	409	1279	1124	586
Future Volume (veh/h)	619	553	409	1279	1124	586
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	652	0	431	1346	1183	554
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	5	5	5	5	5	5
Cap, veh/h	783		527	2179	1395	981
Arrive On Green	0.23	0.00	0.16	0.63	0.40	0.40
Sat Flow, veh/h	3374	1547	3374	3561	3561	1547
Grp Volume(v), veh/h	652	0	431	1346	1183	554
Grp Sat Flow(s),veh/h/ln	1687	1547	1687	1735	1735	1547
Q Serve(g_s), s	11.8	0.0	8.0	15.2	19.9	13.1
Cycle Q Clear(g_c), s	11.8	0.0	8.0	15.2	19.9	13.1
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	783		527	2179	1395	981
V/C Ratio(X)	0.83		0.82	0.62	0.85	0.56
Avail Cap(c_a), veh/h	969		550	2289	1481	1020
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.5	0.0	26.3	7.3	17.5	6.7
Incr Delay (d2), s/veh	5.2	0.0	9.1	0.5	4.6	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.5	0.0	3.4	3.0	6.9	6.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	28.7	0.0	35.4	7.8	22.1	7.4
LnGrp LOS	C		D	A	C	A
Approach Vol, veh/h	652			1777	1737	
Approach Delay, s/veh	28.7			14.5	17.4	
Approach LOS	C			B	B	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		45.0		19.5	14.6	30.4
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		42.5		18.5	10.5	27.5
Max Q Clear Time (g_c+I1), s		17.2		13.8	10.0	21.9
Green Ext Time (p_c), s		9.9		1.1	0.1	4.0

Intersection Summary	
HCM 6th Ctrl Delay	17.9
HCM 6th LOS	B

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary
1: SR 12-121 & Old Sonoma Road

10/24/2023

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	166	1082	1181	8	44	213
Future Volume (veh/h)	166	1082	1181	8	44	213
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1900	1826	1826	1900	1752	1826
Adj Flow Rate, veh/h	169	1104	1205	4	45	111
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	5	5	0	10	5
Cap, veh/h	169	1514	1247	1100	110	247
Arrive On Green	0.09	0.83	0.68	0.68	0.07	0.07
Sat Flow, veh/h	1810	1826	1826	1610	1668	1547
Grp Volume(v), veh/h	169	1104	1205	4	45	111
Grp Sat Flow(s),veh/h/ln	1810	1826	1826	1610	1668	1547
Q Serve(g_s), s	12.5	34.9	82.2	0.1	3.5	8.7
Cycle Q Clear(g_c), s	12.5	34.9	82.2	0.1	3.5	8.7
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	169	1514	1247	1100	110	247
V/C Ratio(X)	1.00	0.73	0.97	0.00	0.41	0.45
Avail Cap(c_a), veh/h	190	1655	1367	1206	187	319
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	60.5	4.9	19.7	6.7	59.8	50.8
Incr Delay (d2), s/veh	62.4	1.5	16.3	0.0	2.4	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.5	7.2	33.1	0.0	1.5	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	122.9	6.5	36.0	6.7	62.2	52.1
LnGrp LOS	F	A	D	A	E	D
Approach Vol, veh/h		1273	1209		156	
Approach Delay, s/veh		21.9	35.9		55.0	
Approach LOS		C	D		D	

Timer - Assigned Phs				4		6	7	8
Phs Duration (G+Y+Rc), s				117.7		15.8	19.5	98.2
Change Period (Y+Rc), s				4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s				124.0		18.0	17.0	103.0
Max Q Clear Time (g_c+I1), s				37.9		11.7	15.5	85.2
Green Ext Time (p_c), s				11.4		0.2	0.1	9.0

Intersection Summary			
HCM 6th Ctrl Delay		30.3	
HCM 6th LOS		C	

HCM 6th Signalized Intersection Summary
2: SR 29 & SR 12-121

10/24/2023

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	584	384	521	1329	1200	498
Future Volume (veh/h)	584	384	521	1329	1200	498
Initial Q (Qb), veh	1	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	608	0	543	1384	1250	478
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	5	5	5	5	5	5
Cap, veh/h	713		636	2315	1450	974
Arrive On Green	0.21	0.00	0.19	0.67	0.42	0.42
Sat Flow, veh/h	3374	1547	3374	3561	3561	1547
Grp Volume(v), veh/h	608	0	543	1384	1250	478
Grp Sat Flow(s),veh/h/ln	1687	1547	1687	1735	1735	1547
Q Serve(g_s), s	12.8	0.0	11.5	16.3	24.3	12.3
Cycle Q Clear(g_c), s	12.8	0.0	11.5	16.3	24.3	12.3
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	713		636	2315	1450	974
V/C Ratio(X)	0.85		0.85	0.60	0.86	0.49
Avail Cap(c_a), veh/h	820		707	2484	1547	1016
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.2	0.0	29.1	6.8	19.6	7.4
Incr Delay (d2), s/veh	7.8	0.0	9.2	0.4	5.0	0.4
Initial Q Delay(d3),s/veh	0.1	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.3	0.0	4.9	3.4	8.8	5.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	36.0	0.0	38.3	7.2	24.7	7.8
LnGrp LOS	D		D	A	C	A
Approach Vol, veh/h	608			1927	1728	
Approach Delay, s/veh	36.0			15.9	20.0	
Approach LOS	D			B	B	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		53.9		20.1	18.5	35.4
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		53.0		18.0	15.5	33.0
Max Q Clear Time (g_c+I1), s		18.3		14.8	13.5	26.3
Green Ext Time (p_c), s		11.5		0.8	0.4	4.7

Intersection Summary			
HCM 6th Ctrl Delay		20.4	
HCM 6th LOS		C	

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary
1: SR 12-121 & Old Sonoma Road

10/24/2023

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	277	1076	822	4	58	309
Future Volume (veh/h)	277	1076	822	4	58	309
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1900	1826	1826	1900	1900	1826
Adj Flow Rate, veh/h	286	1109	847	2	60	177
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	5	5	0	0	5
Cap, veh/h	290	1335	889	784	181	403
Arrive On Green	0.16	0.73	0.49	0.49	0.10	0.10
Sat Flow, veh/h	1810	1826	1826	1610	1810	1547
Grp Volume(v), veh/h	286	1109	847	2	60	177
Grp Sat Flow(s),veh/h/ln	1810	1826	1826	1610	1810	1547
Q Serve(g_s), s	13.1	34.6	36.9	0.1	2.6	7.9
Cycle Q Clear(g_c), s	13.1	34.6	36.9	0.1	2.6	7.9
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	290	1335	889	784	181	403
V/C Ratio(X)	0.99	0.83	0.95	0.00	0.33	0.44
Avail Cap(c_a), veh/h	351	1518	1011	891	368	563
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.8	7.6	20.4	11.0	34.8	25.7
Incr Delay (d2), s/veh	41.3	3.6	17.0	0.0	1.1	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.5	7.6	16.6	0.0	1.1	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	76.1	11.3	37.4	11.0	35.9	26.4
LnGrp LOS	E	B	D	B	D	C
Approach Vol, veh/h		1395	849		237	
Approach Delay, s/veh		24.6	37.3		28.8	
Approach LOS		C	D		C	

Timer - Assigned Phs			4		6	7	8
Phs Duration (G+Y+Rc), s			67.8		15.3	20.3	47.5
Change Period (Y+Rc), s			4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s			72.1		19.9	19.1	49.0
Max Q Clear Time (g_c+I1), s			37.6		10.9	16.1	39.9
Green Ext Time (p_c), s			10.3		0.4	0.2	3.6

Intersection Summary		
HCM 6th Ctrl Delay		29.3
HCM 6th LOS		C

HCM 6th Signalized Intersection Summary
2: SR 29 & SR 12-121

10/24/2023

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	630	563	414	1279	1124	591
Future Volume (veh/h)	630	563	414	1279	1124	591
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	663	0	436	1346	1183	559
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	5	5	5	5	5	5
Cap, veh/h	791		530	2174	1389	983
Arrive On Green	0.23	0.00	0.16	0.63	0.40	0.40
Sat Flow, veh/h	3374	1547	3374	3561	3561	1547
Grp Volume(v), veh/h	663	0	436	1346	1183	559
Grp Sat Flow(s),veh/h/ln	1687	1547	1687	1735	1735	1547
Q Serve(g_s), s	12.1	0.0	8.1	15.4	20.1	13.4
Cycle Q Clear(g_c), s	12.1	0.0	8.1	15.4	20.1	13.4
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	791		530	2174	1389	983
V/C Ratio(X)	0.84		0.82	0.62	0.85	0.57
Avail Cap(c_a), veh/h	962		546	2272	1470	1019
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.7	0.0	26.5	7.4	17.7	6.8
Incr Delay (d2), s/veh	5.6	0.0	9.7	0.5	4.8	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.7	0.0	3.5	3.2	7.1	6.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	29.3	0.0	36.1	7.9	22.5	7.5
LnGrp LOS	C		D	A	C	A
Approach Vol, veh/h	663			1782	1742	
Approach Delay, s/veh	29.3			14.8	17.7	
Approach LOS	C			B	B	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		45.2		19.7	14.7	30.5
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		42.5		18.5	10.5	27.5
Max Q Clear Time (g_c+I1), s		17.4		14.1	10.1	22.1
Green Ext Time (p_c), s		9.8		1.1	0.1	3.8

Intersection Summary		
HCM 6th Ctrl Delay		18.3
HCM 6th LOS		B

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary
1: SR 12-121 & Old Sonoma Road

10/24/2023

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	171	1102	1201	8	44	218
Future Volume (veh/h)	171	1102	1201	8	44	218
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1900	1826	1826	1900	1752	1826
Adj Flow Rate, veh/h	174	1124	1226	4	45	116
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	5	5	0	10	5
Cap, veh/h	174	1518	1252	1104	115	255
Arrive On Green	0.10	0.83	0.69	0.69	0.07	0.07
Sat Flow, veh/h	1810	1826	1826	1610	1668	1547
Grp Volume(v), veh/h	174	1124	1226	4	45	116
Grp Sat Flow(s),veh/h/ln	1810	1826	1826	1610	1668	1547
Q Serve(g_s), s	13.5	37.9	90.3	0.1	3.6	9.5
Cycle Q Clear(g_c), s	13.5	37.9	90.3	0.1	3.6	9.5
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	174	1518	1252	1104	115	255
V/C Ratio(X)	1.00	0.74	0.98	0.00	0.39	0.45
Avail Cap(c_a), veh/h	180	1571	1299	1145	178	314
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	63.5	5.2	21.1	7.0	62.6	53.0
Incr Delay (d2), s/veh	66.3	1.8	19.8	0.0	2.2	1.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.2	8.3	37.8	0.0	1.6	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	129.9	7.0	41.0	7.0	64.8	54.3
LnGrp LOS	F	A	D	A	E	D
Approach Vol, veh/h		1298	1230		161	
Approach Delay, s/veh		23.5	40.9		57.2	
Approach LOS		C	D		E	

Timer - Assigned Phs			4		6	7	8
Phs Duration (G+Y+Rc), s			123.9		16.7	20.5	103.4
Change Period (Y+Rc), s			4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s			124.0		18.0	17.0	103.0
Max Q Clear Time (g_c+I1), s			40.9		12.5	16.5	93.3
Green Ext Time (p_c), s			11.9		0.2	0.0	6.1

Intersection Summary		
HCM 6th Ctrl Delay		33.5
HCM 6th LOS		C

HCM 6th Signalized Intersection Summary
2: SR 29 & SR 12-121

10/24/2023

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	594	394	531	1329	1200	508
Future Volume (veh/h)	594	394	531	1329	1200	508
Initial Q (Qb), veh	1	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	619	0	553	1384	1250	488
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	5	5	5	5	5	5
Cap, veh/h	720		643	2312	1442	973
Arrive On Green	0.21	0.00	0.19	0.67	0.42	0.42
Sat Flow, veh/h	3374	1547	3374	3561	3561	1547
Grp Volume(v), veh/h	619	0	553	1384	1250	488
Grp Sat Flow(s),veh/h/ln	1687	1547	1687	1735	1735	1547
Q Serve(g_s), s	13.2	0.0	11.9	16.5	24.6	12.8
Cycle Q Clear(g_c), s	13.2	0.0	11.9	16.5	24.6	12.8
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	720		643	2312	1442	973
V/C Ratio(X)	0.86		0.86	0.60	0.87	0.50
Avail Cap(c_a), veh/h	812		699	2459	1531	1012
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.4	0.0	29.3	6.9	20.0	7.5
Incr Delay (d2), s/veh	8.5	0.0	10.0	0.4	5.3	0.4
Initial Q Delay(d3),s/veh	0.1	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.6	0.0	5.1	3.5	9.0	5.9
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	37.0	0.0	39.3	7.3	25.3	7.9
LnGrp LOS	D		D	A	C	A
Approach Vol, veh/h	619			1937	1738	
Approach Delay, s/veh	37.0			16.4	20.4	
Approach LOS	D			B	C	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		54.4		20.4	18.8	35.6
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		53.0		18.0	15.5	33.0
Max Q Clear Time (g_c+I1), s		18.5		15.2	13.9	26.6
Green Ext Time (p_c), s		11.4		0.7	0.4	4.5

Intersection Summary		
HCM 6th Ctrl Delay		21.0
HCM 6th LOS		C

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary
1: SR 12-121 & Old Sonoma Road

10/24/2023

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	682	1055	812	70	85	487
Future Volume (veh/h)	682	1055	812	70	85	487
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1900	1826	1826	1900	1900	1826
Adj Flow Rate, veh/h	703	1088	837	70	88	360
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	5	5	0	0	5
Cap, veh/h	615	1461	755	666	193	691
Arrive On Green	0.34	0.80	0.41	0.41	0.11	0.11
Sat Flow, veh/h	1810	1826	1826	1610	1810	1547
Grp Volume(v), veh/h	703	1088	837	70	88	360
Grp Sat Flow(s),veh/h/ln	1810	1826	1826	1610	1810	1547
Q Serve(g_s), s	51.0	44.2	62.0	4.0	6.8	16.0
Cycle Q Clear(g_c), s	51.0	44.2	62.0	4.0	6.8	16.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	615	1461	755	666	193	691
V/C Ratio(X)	1.14	0.74	1.11	0.11	0.46	0.52
Avail Cap(c_a), veh/h	615	1461	755	666	193	691
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.5	7.4	44.0	27.0	62.9	29.9
Incr Delay (d2), s/veh	82.4	2.1	66.9	0.1	1.7	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	36.0	12.5	40.3	1.5	3.2	23.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	131.9	9.5	110.9	27.1	64.6	30.6
LnGrp LOS	F	A	F	C	E	C
Approach Vol, veh/h		1791	907		448	
Approach Delay, s/veh		57.6	104.4		37.3	
Approach LOS		E	F		D	

Timer - Assigned Phs				4		6	7	8
Phs Duration (G+Y+Rc), s				127.0		23.0	58.0	69.0
Change Period (Y+Rc), s				4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s				123.0		19.0	54.0	65.0
Max Q Clear Time (g_c+I1), s				47.2		19.0	54.0	65.0
Green Ext Time (p_c), s				10.9		0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	68.2
HCM 6th LOS	E

HCM 6th Signalized Intersection Summary
2: SR 29 & SR 12-121

10/24/2023

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	749	608	450	1573	1625	877
Future Volume (veh/h)	749	608	450	1573	1625	877
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	788	0	474	1656	1711	860
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	5	5	5	5	5	5
Cap, veh/h	858		474	2320	1700	1152
Arrive On Green	0.25	0.00	0.14	0.67	0.49	0.49
Sat Flow, veh/h	3374	1547	3374	3561	3561	1547
Grp Volume(v), veh/h	788	0	474	1656	1711	860
Grp Sat Flow(s),veh/h/ln	1687	1547	1687	1735	1735	1547
Q Serve(g_s), s	26.7	0.0	16.5	35.5	57.5	37.5
Cycle Q Clear(g_c), s	26.7	0.0	16.5	35.5	57.5	37.5
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	858		474	2320	1700	1152
V/C Ratio(X)	0.92		1.00	0.71	1.01	0.75
Avail Cap(c_a), veh/h	934		474	2320	1700	1152
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.6	0.0	50.4	12.3	29.9	8.6
Incr Delay (d2), s/veh	13.1	0.0	41.1	1.1	23.4	2.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.0	0.0	9.3	11.1	26.6	25.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	55.6	0.0	91.6	13.4	53.4	11.3
LnGrp LOS	E		F	B	F	B
Approach Vol, veh/h	788			2130	2571	
Approach Delay, s/veh	55.6			30.8	39.3	
Approach LOS	E			C	D	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		83.0		34.4	21.0	62.0
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		78.5		32.5	16.5	57.5
Max Q Clear Time (g_c+I1), s		37.5		28.7	18.5	59.5
Green Ext Time (p_c), s		16.1		1.2	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	38.3
HCM 6th LOS	D

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary
1: SR 12-121 & Old Sonoma Road

10/24/2023

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	209	1363	1486	11	56	295
Future Volume (veh/h)	209	1363	1486	11	56	295
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1900	1826	1826	1900	1752	1826
Adj Flow Rate, veh/h	213	1391	1516	7	57	195
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	5	5	0	10	5
Cap, veh/h	169	1461	1205	1063	178	309
Arrive On Green	0.09	0.80	0.66	0.66	0.11	0.11
Sat Flow, veh/h	1810	1826	1826	1610	1668	1547
Grp Volume(v), veh/h	213	1391	1516	7	57	195
Grp Sat Flow(s),veh/h/ln	1810	1826	1826	1610	1668	1547
Q Serve(g_s), s	14.0	95.9	99.0	0.2	4.7	16.0
Cycle Q Clear(g_c), s	14.0	95.9	99.0	0.2	4.7	16.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	169	1461	1205	1063	178	309
V/C Ratio(X)	1.26	0.95	1.26	0.01	0.32	0.63
Avail Cap(c_a), veh/h	169	1461	1205	1063	178	309
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	68.0	12.6	25.5	8.7	62.0	54.9
Incr Delay (d2), s/veh	157.1	13.8	122.9	0.0	1.0	4.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.6	30.8	77.1	0.1	2.0	15.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	225.1	26.4	148.3	8.7	63.0	59.0
LnGrp LOS	F	C	F	A	E	E
Approach Vol, veh/h		1604	1523		252	
Approach Delay, s/veh		52.8	147.7		59.9	
Approach LOS		D	F		E	

Timer - Assigned Phs				4		6	7	8
Phs Duration (G+Y+Rc), s				127.0		23.0	21.0	106.0
Change Period (Y+Rc), s				4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s				123.0		19.0	17.0	102.0
Max Q Clear Time (g_c+I1), s				98.9		19.0	17.0	102.0
Green Ext Time (p_c), s				14.2		0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	96.1
HCM 6th LOS	F

HCM 6th Signalized Intersection Summary
2: SR 29 & SR 12-121

10/24/2023

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	714	470	637	1625	1468	609
Future Volume (veh/h)	714	470	637	1625	1468	609
Initial Q (Qb), veh	1	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	744	0	664	1693	1529	593
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	5	5	5	5	5	5
Cap, veh/h	752		669	2412	1581	1050
Arrive On Green	0.22	0.00	0.20	0.70	0.46	0.46
Sat Flow, veh/h	3374	1547	3374	3561	3561	1547
Grp Volume(v), veh/h	744	0	664	1693	1529	593
Grp Sat Flow(s),veh/h/ln	1687	1547	1687	1735	1735	1547
Q Serve(g_s), s	24.2	0.0	21.6	31.9	47.1	21.9
Cycle Q Clear(g_c), s	24.2	0.0	21.6	31.9	47.1	21.9
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	752		669	2412	1581	1050
V/C Ratio(X)	0.99		0.99	0.70	0.97	0.56
Avail Cap(c_a), veh/h	752		669	2415	1585	1052
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.6	0.0	44.0	10.0	29.1	9.2
Incr Delay (d2), s/veh	30.0	0.0	32.7	0.9	15.4	0.7
Initial Q Delay(d3),s/veh	1.2	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.7	0.0	11.5	9.1	20.6	12.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	73.8	0.0	76.6	10.9	44.5	9.9
LnGrp LOS	E		E	B	D	A
Approach Vol, veh/h	744			2357	2122	
Approach Delay, s/veh	73.8			29.4	34.9	
Approach LOS	E			C	C	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		80.9		29.0	26.3	54.6
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		76.5		24.5	21.8	50.2
Max Q Clear Time (g_c+I1), s		33.9		26.2	23.6	49.1
Green Ext Time (p_c), s		17.0		0.0	0.0	1.0

Intersection Summary	
HCM 6th Ctrl Delay	38.0
HCM 6th LOS	D

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary
1: SR 12-121 & Old Sonoma Road

10/24/2023

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	687	1076	822	70	85	490
Future Volume (veh/h)	687	1076	822	70	85	490
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1900	1826	1826	1900	1900	1826
Adj Flow Rate, veh/h	708	1109	847	70	88	363
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	0	5	5	0	0	5
Cap, veh/h	615	1461	755	666	193	691
Arrive On Green	0.34	0.80	0.41	0.41	0.11	0.11
Sat Flow, veh/h	1810	1826	1826	1610	1810	1547
Grp Volume(v), veh/h	708	1109	847	70	88	363
Grp Sat Flow(s),veh/h/ln	1810	1826	1826	1610	1810	1547
Q Serve(g_s), s	51.0	46.4	62.0	4.0	6.8	16.0
Cycle Q Clear(g_c), s	51.0	46.4	62.0	4.0	6.8	16.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	615	1461	755	666	193	691
V/C Ratio(X)	1.15	0.76	1.12	0.11	0.46	0.53
Avail Cap(c_a), veh/h	615	1461	755	666	193	691
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.5	7.6	44.0	27.0	62.9	30.0
Incr Delay (d2), s/veh	85.6	2.4	71.8	0.1	1.7	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	36.5	13.2	41.3	1.5	3.2	23.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	135.1	10.0	115.8	27.1	64.6	30.7
LnGrp LOS	F	B	F	C	E	C
Approach Vol, veh/h		1817	917		451	
Approach Delay, s/veh		58.7	109.0		37.3	
Approach LOS		E	F		D	

Timer - Assigned Phs				4		6	7	8
Phs Duration (G+Y+Rc), s				127.0		23.0	58.0	69.0
Change Period (Y+Rc), s				4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s				123.0		19.0	54.0	65.0
Max Q Clear Time (g_c+I1), s				49.4		19.0	54.0	65.0
Green Ext Time (p_c), s				11.5		0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	70.2
HCM 6th LOS	E

HCM 6th Signalized Intersection Summary
2: SR 29 & SR 12-121

10/24/2023

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	760	618	455	1573	1625	882
Future Volume (veh/h)	760	618	455	1573	1625	882
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	800	0	479	1656	1711	865
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	5	5	5	5	5	5
Cap, veh/h	875		477	2302	1678	1150
Arrive On Green	0.26	0.00	0.14	0.66	0.48	0.48
Sat Flow, veh/h	3374	1547	3374	3561	3561	1547
Grp Volume(v), veh/h	800	0	479	1656	1711	865
Grp Sat Flow(s),veh/h/ln	1687	1547	1687	1735	1735	1547
Q Serve(g_s), s	26.9	0.0	16.5	35.9	56.5	38.0
Cycle Q Clear(g_c), s	26.9	0.0	16.5	35.9	56.5	38.0
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	875		477	2302	1678	1150
V/C Ratio(X)	0.91		1.00	0.72	1.02	0.75
Avail Cap(c_a), veh/h	968		477	2302	1678	1150
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.0	0.0	50.1	12.6	30.1	8.7
Incr Delay (d2), s/veh	12.2	0.0	42.4	1.1	27.0	2.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.0	0.0	9.4	11.3	27.0	25.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	54.2	0.0	92.6	13.8	57.1	11.6
LnGrp LOS	D		F	B	F	B
Approach Vol, veh/h	800			2135	2576	
Approach Delay, s/veh	54.2			31.4	41.8	
Approach LOS	D			C	D	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		82.0		34.8	21.0	61.0
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		77.5		33.5	16.5	56.5
Max Q Clear Time (g_c+I1), s		37.9		28.9	18.5	58.5
Green Ext Time (p_c), s		15.9		1.4	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	39.6
HCM 6th LOS	D

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

HCM 6th Signalized Intersection Summary
1: SR 12-121 & Old Sonoma Road

10/24/2023

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	214	1383	1506	11	56	300
Future Volume (veh/h)	214	1383	1506	11	56	300
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1900	1826	1826	1900	1752	1826
Adj Flow Rate, veh/h	218	1411	1537	7	57	200
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	0	5	5	0	10	5
Cap, veh/h	168	1463	1209	1066	177	307
Arrive On Green	0.09	0.80	0.66	0.66	0.11	0.11
Sat Flow, veh/h	1810	1826	1826	1610	1668	1547
Grp Volume(v), veh/h	218	1411	1537	7	57	200
Grp Sat Flow(s),veh/h/ln	1810	1826	1826	1610	1668	1547
Q Serve(g_s), s	14.0	102.0	100.0	0.2	4.8	16.0
Cycle Q Clear(g_c), s	14.0	102.0	100.0	0.2	4.8	16.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	168	1463	1209	1066	177	307
V/C Ratio(X)	1.30	0.96	1.27	0.01	0.32	0.65
Avail Cap(c_a), veh/h	168	1463	1209	1066	177	307
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	68.5	13.1	25.5	8.6	62.5	55.7
Incr Delay (d2), s/veh	172.0	15.8	128.5	0.0	1.0	4.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.3	33.3	79.5	0.1	2.0	15.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	240.5	28.9	154.0	8.6	63.5	60.5
LnGrp LOS	F	C	F	A	E	E
Approach Vol, veh/h		1629	1544		257	
Approach Delay, s/veh		57.2	153.4		61.2	
Approach LOS		E	F		E	

Timer - Assigned Phs				4		6	7	8
Phs Duration (G+Y+Rc), s				128.0		23.0	21.0	107.0
Change Period (Y+Rc), s				4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s				123.0		19.0	17.0	103.0
Max Q Clear Time (g_c+I1), s				105.0		19.0	17.0	103.0
Green Ext Time (p_c), s				12.0		0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	100.8
HCM 6th LOS	F

HCM 6th Signalized Intersection Summary
2: SR 29 & SR 12-121

10/24/2023

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	724	480	647	1625	1468	619
Future Volume (veh/h)	724	480	647	1625	1468	619
Initial Q (Qb), veh	1	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1826	1826	1826	1826	1826	1826
Adj Flow Rate, veh/h	754	0	674	1693	1529	604
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	5	5	5	5	5	5
Cap, veh/h	754		690	2410	1558	1041
Arrive On Green	0.22	0.00	0.20	0.69	0.45	0.45
Sat Flow, veh/h	3374	1547	3374	3561	3561	1547
Grp Volume(v), veh/h	754	0	674	1693	1529	604
Grp Sat Flow(s),veh/h/ln	1687	1547	1687	1735	1735	1547
Q Serve(g_s), s	24.6	0.0	21.8	32.0	47.8	23.0
Cycle Q Clear(g_c), s	24.6	0.0	21.8	32.0	47.8	23.0
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	754		690	2410	1558	1041
V/C Ratio(X)	1.00		0.98	0.70	0.98	0.58
Avail Cap(c_a), veh/h	754		690	2410	1558	1041
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.7	0.0	43.5	10.0	29.8	9.7
Incr Delay (d2), s/veh	32.6	0.0	28.4	0.9	18.5	0.8
Initial Q Delay(d3),s/veh	4.5	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.5	0.0	11.3	9.1	21.5	12.9
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	79.8	0.0	71.9	11.0	48.3	10.5
LnGrp LOS	E		E	B	D	B
Approach Vol, veh/h	754			2367	2133	
Approach Delay, s/veh	79.8			28.3	37.6	
Approach LOS	E			C	D	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		80.9		29.1	27.0	53.9
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		76.4		24.6	22.5	49.4
Max Q Clear Time (g_c+I1), s		34.0		26.6	23.8	49.8
Green Ext Time (p_c), s		16.9		0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	39.5
HCM 6th LOS	D

Notes

Unsignalized Delay for [EBR] is excluded from calculations of the approach delay and intersection delay.

November 30, 2023

Ms. Allison Cellini Wilson
Nights in White Satin, LLC
1473 Yountville Cross Road
Yountville, CA 94599

Response to Comments on the Draft *Transportation Impact Study for the Nights in White Satin Winery Project*

Dear Ms. Wilson;

W-Trans is in receipt of comments relative to our draft *Transportation Impact Study for the Nights in White Satin Winery Project* (TIS), March 23, 2023, from Mr. Ahsan Kazmi, the County's Traffic Engineer in a memorandum dated August 8, 2023. The comments from the memorandum are paraphrased and addressed below. While most comments were addressed through updates to the report, following are discussions of comments that did not result in the specific changes requested.

Study Area and Periods (Page 5). Add and provide roadway description of Napa Road.

The report has been updated to indicate that the intersection of SR 12-121/Napa Road was not evaluated as this location is in Sonoma County, is under the jurisdiction of Caltrans, and has been evaluated in other studies which indicate that it is currently operating at LOS C. Caltrans does not consider LOS in evaluating development projects, and the County of Napa's policies are not applicable, so the intersection was not evaluated.

Collision History (Page 6). The collision rate in the vicinity of the proposed project is higher than the State average. No remedies are discussed to improve safety conditions, specifically on SR 12 west of the site.

While the collision rate is above-average, the project will provide a left-turn lane to move inbound vehicles out of the path of through traffic. The existing eight-foot shoulder could be used by drivers turning right into the site to slow outside the path of through traffic. With these improvements the project would not be expected to contribute to the existing collision patterns. Increased enforcement and potentially a radar speed feedback sign have been suggested as a means to reduce speeds and thereby collisions.

Vehicle Miles Traveled (Page 12). Verify "truck trips" does not include light duty trucks.

The volume of truck traffic comes directly from the County's Winery Trip Generation Worksheet. It is unclear from the worksheet whether light duty trucks are included or not.

Table 3, Estimated Employee VMT Reduction (Page 16). Please include Vanpool in TDM Measures.

As a 15-percent reduction in trips can be achieved without a vanpool, this change was not made to the TIS. We suggest that a TDM Plan that includes the measures feasible and appropriate for this project be created from the information in the TIS and submitted for staff's review and approval.

Table 7, Future Peak Hour LOS (Page 22). Recheck LOS analysis for SR 12-121/SR 29. Delay decreased from existing to future during Saturday PM Peak.

The analysis of existing operation was inadvertently based on signal timing that forced all phases to the maximum length possible rather than reflecting the demand-responsive operation in effect at this location. Upon using optimized timing instead, the results are more consistent and comparable.

In combination with the changes made to the traffic study, we believe this addresses all of the comments from County staff.

Sincerely,

Dalene J. Whitlock, PE, PTOE
Senior Principal

DJW/djw/NAX152-1.L1

March 25, 2024

Ms. Kelli Cahill
County of Napa
1473 Yountville Cross Road
Yountville, CA 94599

Response to Caltrans Comments on the Transportation Impact Study for the Nights in White Satin Winery Project

Dear Ms. Cahill;

Subsequent to issuance of the *Transportation Impact Study for the Nights in White Satin Winery Project* (TIS), November 3, 2023, which included responses to previous comments from Caltrans, additional comments from Caltrans were received on January 10, 2024, as relayed to us via email. Following are these additional comments and our responses.

1. The project proposes to relocate an existing driveway along Route 121 to another location that intersects another unidentified roadway as the project access. This creates a new intersection along the SHS which may require an ICE evaluation.

An intersection is defined in the *California Vehicle Code* as "the area embraced within the prolongation of the lateral curb lines, or, if none, then the lateral boundary lines of the roadways, of two highways which join one another at approximately right angles or the area within which vehicles traveling upon different highways joining at any other angle may come in conflict." The CVC defines a highway as a way or place of whatever nature, publicly maintained and open to the use of the public for purposes of vehicular travel. Since only SR 12-121 is a public street and the two intersecting side "streets" are private driveways, a new intersection is not being created through the addition of a second driveway across from an existing driveway with a left-turn pocket. An Intersection Control Evaluation (ICE) is therefore not warranted.

2. Page 6 defines the new project access along Route 121 as "not an intersection" and yet provided a turn lane. Since new access is along the SHS, the HDM should be used for guidelines.

The need for a left-turn lane on SR 12-121 at the project driveway was evaluated based on criteria contained in the *Guidelines for Reconstruction of Intersections*, Caltrans, August 1985. The values provided in Table V-1 on Page 55 were used to develop a regression formula that best fits the criteria published by Caltrans. Using the Existing plus Project peak hour volumes it was determined that a left-turn pocket is warranted, as shown Appendix D of the TIS, hence one is proposed as part of the project. The *Highway Design Manual* has been used for guidance in designing the new left-turn lane and the warrant analysis was based on adopted Caltrans methodology.

3. Page 7 of TIS indicates using 2017 pre-pandemic data. It is preferred to use traffic data within a 3-year period when conducting analysis, especially at this corridor. CT has more recent (2023, see attached traffic counts) traffic data along Route 121. It is not clear where the 2017 data were used in the analysis.

While data for 2020 was available at the time of the analysis, as shown in Appendix B of the TIS, because the volumes from 2017 were higher, these were used to provide a more conservative evaluation. A

comparison of the 2017 counts with the data provided by Caltrans indicates that 2023 volumes are also lower than the 2017 volumes used. The 2017 counts were applied in the left-turn lane warrant analysis, as indicated on the output in Appendix D.

4. This project should be routed for review and concurrence on turn lane warrants obtained from the Office of Traffic Safety.

It is unclear whether this comment is intended for internal action or external, though if external then it is assumed that this comment is directed to the County s all agency coordination is typically managed through the lead agency, in this case the County.

5. Page 22 of the TIS, access to and from this project is via the State Route 121, however, the TIS states that adequacy of project's traffic operation will be evaluated using the County standard. Although VMT is used for CEQA, effective traffic operations on the state highway system remains in Caltrans' purview.

It is understood that operation on the highway is under Caltrans jurisdiction. However, as of May 2020, Caltrans has repealed its operational standards for Caltrans facilities to instead focus on VMT. Therefore, County standards were used for the operational analysis.

6. Page 23, 4th paragraph bullets 1 and 3, these segments are under the State's jurisdiction and should follow the State's significance threshold.

As noted above, the State no longer has a significance criterion for Levels of Service (LOS); the only reference to LOS in the *Vehicle Miles Traveled-Focused Transportation Impact Study Guide* is the statement that the Department is transitioning away from requesting LOS. By providing the VMT analysis the TIS addresses the standards of significance published by Caltrans. To address operational effects, County standards were used as Caltrans does not currently maintain an adopted standard.

7. Page 24 indicates existing conditions were evaluated based on traffic data collected in December 2022. Please explain what the 2017 traffic data (see page 7) was used for.

See response to Comment #3 above.

8. Please provide a reason for studying Fridays.

The County of Napa requires analysis of Friday and Saturday p.m. peak periods.

9. Figure 3 included the turning movement counts to and from the project but did not consider the turning movements to and from the unidentified roadway across the new driveway, please explain why.

The turning movements at the project driveway were added in response to a request from County staff. This graphic depicts project trips only; volumes for the opposing driveway are not relevant as this location was only evaluated for project access and not operations. This is standard practice for locations where driveways connect to public roads, with traffic operations being reserved for the intersection of two public

roads (see response to Comment #1). The need for facilities such as left-turn lanes into the project site is not affected by the presence of traffic on the driveway opposite the project driveway.

10. Recommendations indicate frontage road improvements, but it's not clear where the frontage road is located.

There is no reference to a "frontage road" in the TIS. The recommendation for "frontage improvements" is in regard to the installation of a westbound left-turn lane on the highway as well as the driveway connection, signage, landscaping, etc. The recommendation was made to dedicate right-of-way along SR 12-121 if necessary to accommodate the planned future bike lane.

We hope this information is adequate to address the comments from Caltrans. Please let us know if you need anything further.

Sincerely,

Dalene J. Whitlock, PE (Civil, Traffic), PTOE
Senior Principal

DJW/djw/NAX152-2.L2

May 1, 2024

Ms. Kelli Cahill
County of Napa
1473 Yountville Cross Road
Yountville, CA 94599

Response to Comments on the Transportation Impact Study for the Nights in White Satin Winery Project

Dear Ms. Cahill;

Subsequent to the issuance of the *Transportation Impact Study for the Nights in White Satin Winery Project* (TIS), November 3, 2023, which included responses to previous comments from Caltrans, comments from the County's peer reviewer at TJKM were received on January 10, 2024, as relayed to us via email. Following are these additional comments and our responses.

1. On Page 7 of the TIS, it is stated that traffic counts from 2017 are provided in Appendix A. However, the counts provided in Appendix A are from December 2022.

Appendix A includes traffic counts from multiple years. The final page of Appendix A includes traffic counts from 2017 and 2020 that Caltrans collected along SR-121 near the project site. The count data from 2022 are the intersection movements that were collected for this study.

2. Page 7 of the TIS, it is identified that the collision rate in the vicinity of the proposed driveway is just under four-times the state average for similar facilities. It is further stated that the project would not contribute to existing collision patterns since a left-turn lane will be provided and there's an existing eight-foot shoulder for right-turning vehicles. However, the report does not discuss the impact of project-added conflict points due to project trips exiting the driveway and available gaps in relationship with congestion on the highway. Please expand on the potential project impacts on collisions at the driveway. Provide the percentage of collisions that were due to unsafe speed and if this speed was over the posted speed limit, for unsafe for conditions. Also, please state where the Average Daily Traffic (ADT) volumes were sourced for the collision rate calculation.

Project-added trips entering SR-121 from the project driveway are expected to have adequate gaps to safely enter traffic as drivers waiting to enter have a calculated average delay of 16.5 seconds, which is well within the range that would be considered acceptable for a public intersection per the County's policies. Of the 55 collisions that occurred along SR-121 in the study area, 30 were due to unsafe speeds or 54.5 percent of the total number of collisions. The Statewide Integrated Traffic Records System (SWITRS) does not report the speed of vehicles before a collision and only states that unsafe speeds were the primary collision factor. This could mean that drivers were going above the speed limit or at or below the speed limit, but too fast for road conditions, such as might occur during rain or in congested conditions. The traffic counts were requested from Caltrans for both 2017 and 2020 to compare pre-pandemic counts to pandemic traffic. It was determined that the 2017 counts were higher and would present a more conservative analysis and so were used in the report. A further comparison was made between data from 2017, 2021, and 2022 and it was determined that the 2017 were still the highest and so would still present the most conservative analysis.

3. On Page 20 of the TIS, it is stated that the 2017 and 2020 volumes were used to evaluate the need for a right-turn lane or taper. However, the source of these volumes are not provided. Please provide the source of the volumes.

See the response to Comment #1 above.

4. Additionally, the hourly through volumes used for the analysis in Appendix D, appear to be quite low when compared to the volumes of the nearby downstream Study Intersection #1. For example, the existing PM weekday eastbound volume at Study Intersection #1 is 1327 vehicles (1055 EBT + 272 EBL) based on Figure 1, however, the through volume used for the right-turn analysis in Appendix D is 398 vehicles. Please provide the existing traffic volumes at the project driveway in addition to the two study intersections and provide the source of these volumes.

The volumes used for the turn lane warrants at the proposed project driveway location were obtained from Caltrans. These volumes were used instead of the turning movement volumes at the study intersections because the study intersections are about 1.5 miles away from the project site with multiple intersections between them and so were deemed less usable than the segment counts Caltrans collected. Applying higher turning movement volumes from a previous study that included the intersection of SR 12-121/Duhig Road which had similar volumes to the counts taken at the intersection of SR 12-121/Old Sonoma Road and the traffic volumes taken at the intersection of SR 12-121/Old Sonoma Road instead of the segment traffic still does not warrant a right-turn lane at the project driveway because the project would not generate the required 40 right turns in an hour during any of the peak hours analyzed. A right-turn taper would be warranted using the turning movement volumes, but this would be adequately met by the existing shoulder and proposed bike lane. Copies of the turn lane warrant and traffic counts are enclosed.

5. Comment #4 also applies for the Queuing analysis on Page 20. Please confirm the traffic counts used as the basis for this analysis at the driveway.

See the response to Comment #4 above about why the Caltrans counts were used. Applying the higher turning movement volumes from the intersection of SR 12-121/Duhig Road and SR 12-121/Old Sonoma Road would not cause the expected queuing lengths on SR 12-121 to lengthen beyond the queuing length determined using the Caltrans count data under the volumes for any scenario. Copies of the queue length calculation with the adjusted volumes are enclosed.

6. On Page 29 of the TIS, it is stated that 50 parking spaces are provided, however, the Conceptual Plans only show a total of 44 parking spaces, 28 for visitors and 16 for employees. Please update parking analysis based on the number of parking spaces shown on the plans.

An older conceptual plan showed a total of 44 parking spaces but was updated to provide six more parking spaces for a total of 50 parking spaces. This updated site plan is included in the report as Figure 2 and was the basis for the parking analysis.

7. On Page 11 of the TIS, it is stated that SR12-121 is identified in the NVTA Countywide Bicycle Plan with proposed Class II Bike Lanes. It is further stated that the proposed project plans maintains the eight-foot shoulders on SR 12-121 which can be used for a future Class II facility. However, this conflicts with the Collision discussion on Page 7 that states the shoulder is maintained for right-turning vehicles

to reduce rear-end collisions. If the shoulder is converted to a Class II facilities, this should be separate from the deceleration area for right-turning vehicles as a matter of safety in an area that experiences a high rate of rear-end collisions. Please address this potential conflict.

According to Section 22100 of the *California Vehicle Code* (CVC) when a driver is approaching for and making a right turn they must be as close to the curb or edge of the road as possible. Section 21717 of the CVC requires a right-turning driver to merge into a bike lane before making their turn if that bike lane is between the driver and the edge of the road so that the driver can be compliant with Section 22100. Since drivers of motor vehicles are required to yield to bicyclists in a bike lane and the volume of bicyclists that would use the proposed bike lane is expected to be low it does not pose a safety or policy concern for the bike lane to also serve as a right-turn deceleration lane.

We hope this information is adequate to address the comments from TJKM. Please let us know if you need anything further.

Sincerely,

William Andrews, EIT
Assistant Engineer

Dalene J. Whitlock, PE (Civil, Traffic), PTOE
Senior Principal

DJW/djw/NAX152-2.L3

Enclosures: Turn-lane Warrants, Traffic Counts, Queuing Worksheet