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Traffic Study

Bremer Family Winery (P22-00086)
Planning Commission Hearing – May 6, 2026

Updated Traffic Study Report

Proposed Bremer Family Winery Use Modification Project

Final Report Submittal

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Executive Summary

The proposed Bremer Family Winery Use Modification project consists of moderate increases in production, employment, and marketing to allow the Winery to respond to changing economic conditions. However, there would be no increases in daily or weekly visitation under currently permitted conditions. The Winery is located at 975 Deer Park Road in St. Helena, Napa County--- (**see Figure 6.1--Project Vicinity Map**). Production using primarily on-site grapes is proposed to increase from 15,000 to 50,000 gallons per year. The Winery remains staffed by family members, but employment would increase by four (4) full-time employees (only) during both the harvest/crush season and non-harvest/crush periods. Visitation at the Winery would remain unchanged from current permitted levels. Visitation currently equates to 70 guests per day and 490 guests per week. Finally, requested marketing activities would include seven annual events with a maximum attendance of 100 guests (twice per year). A VMT/TDM reduction plan is proposed even with minimal increases in proposed Use Modification traffic. Based on input from Napa County Traffic Engineering staff, one intersection along Deer Park Road was analyzed for existing, near-term, and cumulative conditions with and without the proposed project. This included the Deer Park Road/Sanitarium Road/Bremer Family Winery driveway intersection. In addition, the arterial segment of Deer Park Road north and south of Sanitarium Road was evaluated for peak hour weekday operating conditions.

Based on analyses of Existing, Near-Term, and Cumulative traffic conditions with and without the project; the following findings and recommendations are presented:

1. Existing (No Project) Conditions

The study intersection of Deer Park Road/Sanitarium Road/Bremer Family Winery driveway is currently operating at LOS B during both the weekday (Friday) PM peak hour and weekend (Saturday) midday peak hour for the stop-sign controlled eastbound movements from Sanitarium Road onto Deer Park Road. Based on collision history analysis, the intersection also experiences an accident rate slightly higher than the State average for similar facilities based on the number of “rear-end” and “broadside” accidents. The Deer Park Road/Sanitarium Road/Bremer Family Winery driveway intersection does not qualify for the peak hour signal warrant under Existing Conditions

Arterial operation is acceptable on the Deer Park Road segments north and south of Sanitarium Road at LOS A during both the weekday PM peak and weekend midday peak hours.

2. Near-Term (No Project) Conditions

Under Near-Term (No Project) conditions, approved project traffic was added to existing traffic volumes to account for increased growth within the project study area. Specifically, one winery project was identified from the County’s “Current Project List” located northeast of the project site in the Angwin Area. This included the “Aloft Winery”.” The Aloft Winery project is expected to generate 15 weekday PM peak hour trips and 19 weekend (Saturday) peak hour trips. With approved project trips added to existing volumes, the Deer Park Road/Sanitarium Road/Bremer Family Winery driveway intersection would be operating.at LOS B during both the weekday and weekend peak hours.

Based on increases in traffic volumes from Near-Term (approved) traffic growth on Deer Park Road, the north-south arterial segments on Deer Park Road would be operating at LOS A (276 vehicles southbound).

3. Cumulative (No Project) Conditions

With Cumulative Year 2030 (No Project) conditions, cumulative volume projections for Deer Park Road and Sanitarium Road were reviewed from the Solano - Napa Activity Based Model (SNABM). Using the growth in volumes between 2015 and 2040 in Napa County, overall growth would increase by 64% over a 25-year period or 2.56% per year.[1] Cumulative Year 2030 (No Project) conditions represent an approximate 7-year period or 17.92% increase in existing volumes to allow for both local and regional growth.

With Cumulative Year 2030 (No Project) traffic growth added to existing volumes, the Deer Park Road/Sanitarium Road/Bremer Family Winery driveway intersection would be operating.at LOS C during the weekday (Friday) PM peak hour and LOS B during the weekend (Saturday) midday peak hour.

[1] Solano Transportation Authority (STA) | Napa Valley Transportation Authority (NVTA, Solano Napa Activity – Based Model (SNABM), Model Documentation, Table 28, August 27, 2020.

Based on increases in traffic volumes from Cumulative Year 2030 (No Project) traffic growth on Deer Park Road, the north-south arterial segments on Deer Park Road would be operating at LOS A (316 vehicles southbound).

Proposed Project Impacts

4. Trip Generation

Proposed project daily and peak hour trip generation was conservatively based on Napa County Trip Generation ratios for winery production, employment, and visitation (see **Appendix D**). Based on the most recent County ratios, the project is estimated to generate 16 net new daily trips with 5 weekday PM peak hour trips and 4 net new weekend daily trips with 2 Saturday midday peak hour trips.

5. Intersection/Arterial Impacts

With proposed project traffic, intersection operation at the Deer Park Road/Sanitarium Road/Bremer Family Winery driveway would remain unchanged from "No Project" levels under Existing, Near-Term, and Cumulative Year 2030 conditions. The intersection would continue to operate at LOS B during both the weekday and weekend peak hours under Existing Plus Project and Near-Term Plus Project conditions. Under Cumulative Year 2030 Plus Project conditions, the Deer Park Road/Sanitarium Road/Bremer Family Winery driveway would operate at LOS C during the weekday PM peak hour and LOS B during the weekend midday peak hour.

The Deer Park Road/Sanitarium Road/Bremer Family Winery driveway intersection would not qualify for the peak hour signal warrant under any "with project" scenarios including Existing, Near-Term, and Cumulative Year 2030 conditions.

Arterial LOS would remain unchanged from "No Project" levels under Existing, Near-Term, and Cumulative Year 2030 conditions. The north-south Deer Park Road segments would continue to operate at LOS A.

Site Access/Design Parameters

6. Driveway Access

With proposed Use Modifications, driveway access for the Bremer Family Winery would be modified to allow improved circulation to/from Deer Park Road as well as from on-site areas. Specifically, a new driveway is proposed to be constructed approximately 185-feet south of the existing Bremer Family Winery driveway that would connect to the on-site internal drive. The new driveway would extend from the south on-site parking area west to Deer Park Road. The installation of a second driveway would serve to provide three purposes:

1. Disperse project-generated daily and peak hour vehicle trips;
2. Remove conflicting turning movements from the primary Bremer Family Winery driveway at its intersection with Deer Park Road-Sanitarium Road;
3. Provide more uniform traffic flow within the project site with clear inbound/outbound direction.

With the new south Bremer Family Winery driveway, all vehicle flow to the project site would be inbound from the primary (existing) project driveway opposite Sanitarium Road and out via the new driveway. This vehicle flow would serve to remove all outbound trips (westbound) from project site at the Deer Park Road/Sanitarium Road/Bremer Family Winery intersection. All outbound project trips would use the new south Bremer Family Winery driveway to access Deer Park Road in a north or south direction. To enforce directional turning movements and provide wayfinding for the inbound and outbound Winery driveways at Deer Park Road, the following measures are recommended for motorists approaching the project driveways from Deer Park Road:

- An "**Entrance Only**" sign should be placed at the main Bremer Family Winery driveway opposite Sanitarium Road;
- An "**Exit Only**" sign should be placed at the planned South Bremer Family Winery driveway.

It is noted that similar applications have been used in Napa Valley where one-way loop roads/driveways exist. A prime example would the existing limited access driveways serving the Oakville Grocery where similar signage exists.

7. Vehicle Site Distance

Radar speed surveys of Deer Park Road were conducted for the roadway in the project area.[2] The "critical" vehicle speed (the speed at which 85% of all surveyed vehicles travel at or below) along Deer Park Road was measured at 52 mph at the project driveway. The posted speed limit in the project driveway area is 45 mph. Caltrans' design standards indicate that these vehicle speeds require a stopping sight distance of 450-460 feet both north and south of the driveway measured along the travel lanes of Deer Park Road.[3] Based on field measurements, sight distance from the Bremer Family Winery driveway to the north on Deer Park Road is approximately 490 feet. Sight distance from the existing driveway to the south is in excess of 650 feet. Therefore, the sight distance recommendations would be met for the speed limit and measured vehicle speeds.

Extending to the proposed south Bremer Family Winery driveway at Deer Park Road; the driveway would be located approximately 185-feet south of the existing primary Winery driveway opposite Sanitarium Road. Given a measured sight-distance in excess of 650-feet from the existing Winery driveway would allow for 465-feet of vehicle sight-distance from the new south Winery driveway which would be adequate based on Caltrans requirements.

8. Left-Turn Lane Warrant

Existing plus Project volumes were compared with the Napa County guidelines for installing a southbound left-turn lane on Deer Park Road at the Bremer Family Winery north driveway.[4] (The warrant graph for "worst case" weekday Friday PM conditions is provided in the **Appendix F**). Napa County left-turn lane warrant is based on the combination of total proposed project daily trips at the driveway and overall daily volumes on Deer Park Road. Based on a peak weekday visitation of 70 guests, the proposed project would be expected to generate 107.2 (or 108) daily trips during the weekday Friday period when combined with proposed employment and production uses. At the County's direction, all 108 daily project trips have been focused at the Bremer Family Winery north driveway. Combined with 3,323 ADT on Deer Park Road (Existing plus Project Conditions), a southbound left-turn lane would be warranted on Deer Park Road at the Sanitarium Road/Bremer Family Winery north driveway based on County ADT warrant requirements.

9. Internal Circulation

With the proposed project site plan, the existing Bremer Family Winery project driveway from Deer Park Road would be improved from existing conditions to County standards for emergency vehicle access (see Project Site Plan---Figure 6.1). The main project driveway would extend east from Deer Park Road approximately 500 feet and provide access to winery production and storage areas (to the east). As noted, all vehicle traffic traveling to the Winery would be inbound from the existing Bremer Family Winery driveway (opposite Sanitarium Road). Approximately 200-feet east of Deer Park Road, the internal driveway would split; the eastward internal leg would extend another 300 -feet to Winery production areas before looping around to re-join the southeast leg of the driveway. The southeast leg would extend past Winery parking areas (to the Farmhouse) before turning southwest back towards Deer Park Road. This internal loop road allows vehicles to circulate through the site to access parking areas located off the driveway and in the southeast portion of the site adjacent to vineyard areas. The vehicle circulation area in front of the main winery tasting buildings would allow access for emergency vehicles (fire trucks) and parking areas south these winery facilities. The internal southwest segment of the loop road would provide access to new guest parking areas before extending west to Deer Park Road approximately 185-feet south of Sanitarium Road.

Vehicle Miles Traveled

Based on Napa County VMT guidelines, the following criteria would screen the proposed Bremer Family Winery Use Modification project from further VMT analysis (see Section 8—Vehicle Miles Traveled). However, a TDM plan is suggested consistent with County policies and guidelines.

Given the largely rural nature of Napa County, a reasonable screening approach is to apply a combination of the concepts and guidelines expressed in both the OPR Technical Advisory and the Napa County TIS Guidelines. Development projects proposed in Napa County can use the following structure to determine what level of VMT analysis will be required:

A Project modifying an existing facility that would generate additional trips where the net cumulative result of all project modifications after January 1, 2022 would generate less than 110 net new daily passenger vehicle and truck trips

[2] Omni Means Engineers & Planners, Radar vehicle speed surveys, Deer Park Road, February 10, 2017.
[3] Caltrans, Highway Design Manual, Table 405.1A, Corner (Stopping) Sight Distance, July 1, 2020.
[4] Napa County, Adopted Road and Street Standards, revised April 18, 2023.

a. Project is not required to prepare a TIS

b. Project is presumed to have a less-than-significant environmental impact for VMT

c. Applicant is encouraged to describe the measures they are taking and/or plan to take that would reduce the Project's trip generation and/or VMT

Based on the above Napa County VMT analysis and criteria, the proposed project is calculated to generate 16 net new daily trips on a weekday (maximum) and satisfies all requirements to be screened out and not require VMT analysis.

Transportation Demand Management

TDM Plan

The following measures are suggested and/or occurring to further reduce the demand of vehicles to/from the site. Given the nature of the proposed Use Modification with small increases in employment and no increases in daily guest visitation, large TDM measures are not practical given the location overall size of the Winery operations. However, specific TDM measures are described in some detail below.

Tours and Tastings/Marketing Events:

- When smaller marketing events are being held at the Winery (25-50 guests), the combination of tours/tastings and marketing event shall not exceed 70 daily visitors.
- When large marketing events occur twice per year (100 guests), 25 tours/tasting visitors shall be allowed on those days. However, all marketing event guests will be transported to/from the Winery via hire car (buses and/or vans) on that day. In addition, tours and tastings shall be scheduled during the morning and early afternoon hours (10:00 a.m. – 3:00 p.m.) to avoid any conflicts with the larger marketing event that are held in the later afternoon and evening hours (see Marketing Event Operations).
- To the maximum extent feasible, scheduling of tours and tastings shall not occur during peak travel times between 4:00-6:00 p.m. (weekdays) and 1:00-3:00 p.m. (weekends).

Shuttles, Hire Car, Limousines

- To the maximum extent possible, shuttle and other high occupancy vehicles shall transport guests to marketing events or tours and tastings for groups of 15 or more persons, with all vehicles parking on-site in designated areas.

Employee/Guest Incentives:

Employees:

The project applicant indicates that all current vineyard workers currently carpool to the project site. In addition, the applicant lives within one-mile of the Winery reducing overall VMT trip lengths. The Winery applicant currently ***provides low-cost housing*** for employees both on-property and within close proximity to the Winery.

Marketing Event Operations:

The project applicant indicates that when the Winery hosts large marketing events (two events year @ 100 guests), a majority of the guests stay at local hotels in the Napa Valley.[5] The Winery then uses hire vehicles (buses and/or vans) to transport the guests safely to/from the Winery for the dinner/event. Depending on the number of vans/buses, the vehicles will stay at the Winery during the event and then transport the guests back to the hotels upon completion. The large marketing events typically occur between 7:00 p.m. and 11:00 p.m. outside of the peak traffic flows. In addition to guest transportation, the associated catering generates four (4) truck trips; one truck arrives the day prior to the event for set-up then the day after the event for tear-down. Five (5) employees (event only) drive to the gathering. With these large 100-guest event TDM measures, it is estimated that overall trip generation is reduced to approximately 25-35 vehicle trips accounting for guest, catering, and employee activities.

In addition to the employee TDM measures currently embedded in Winery operations, the following is suggested:

- Staggered employee work hours: The winery will make efforts to have employees who do not live on-site arrive and/or depart the premises outside of the peak commute periods. For example, wine production employees would be encouraged to arrive prior to 7:00 a.m. and to depart before 3:00 p.m. (before 12:00

[5] John Bremer, Applicant/Owner, Bremer Family Winery, Large event transportation demand management (TDM) measures, Personal communication, April 8, 2023.

p.m. on the weekends). The exception would be during the crush/harvest season. Employees working in the visitor-serving capacities would be encouraged to arrive after 9:00 a.m. and depart after 6:00 p.m. (after 4:00 p.m. on weekends);

- Ride Share/Car Free Operations: The winery will make efforts to encourage ride shares and "car free" tourism as described in the program of the Napa Valley Destination Council and Napa Valley Transportation Agency.

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1. Introduction

The following report provides a focused traffic impact analysis (TIA), vehicle miles traveled (VMT), and transportation demand management (TDM) plan for the proposed Bremer Family Winery Use Permit Modification project located at 975 Deer Park Road in St. Helena (see **Figure 1.1**—Project Vicinity Map). Recent comments on the initial project work-scope were provided by Napa County Planning, Building, and Environmental Services (PBES), Department of Public Works.[6] As a result of Napa County comments, the analysis has been refined to reflect their concerns and direction associated with potential transportation impacts from proposed project Use Modifications.

Based on the most recent detailed project description, the use permit modification will involve moderate increases in wine production and employment with no increase in the maximum number of *daily* and *weekly* visitation. However, the Winery's marketing plan would be modified to hold seven (7) annual events consistent with current Winery activities. Proposed project access to/from Deer Park Road would be modified to allow for alternative vehicle access to aide in dispersing overall driveway volumes associated with Winery activities. One of the key tasks of the TIA was to evaluate the overall operation of the primary project driveway opposite Sanitarium Road. With proposed project circulation improvements, it is anticipated vehicle conflicts would be reduced at this intersection improving overall delays and safety.

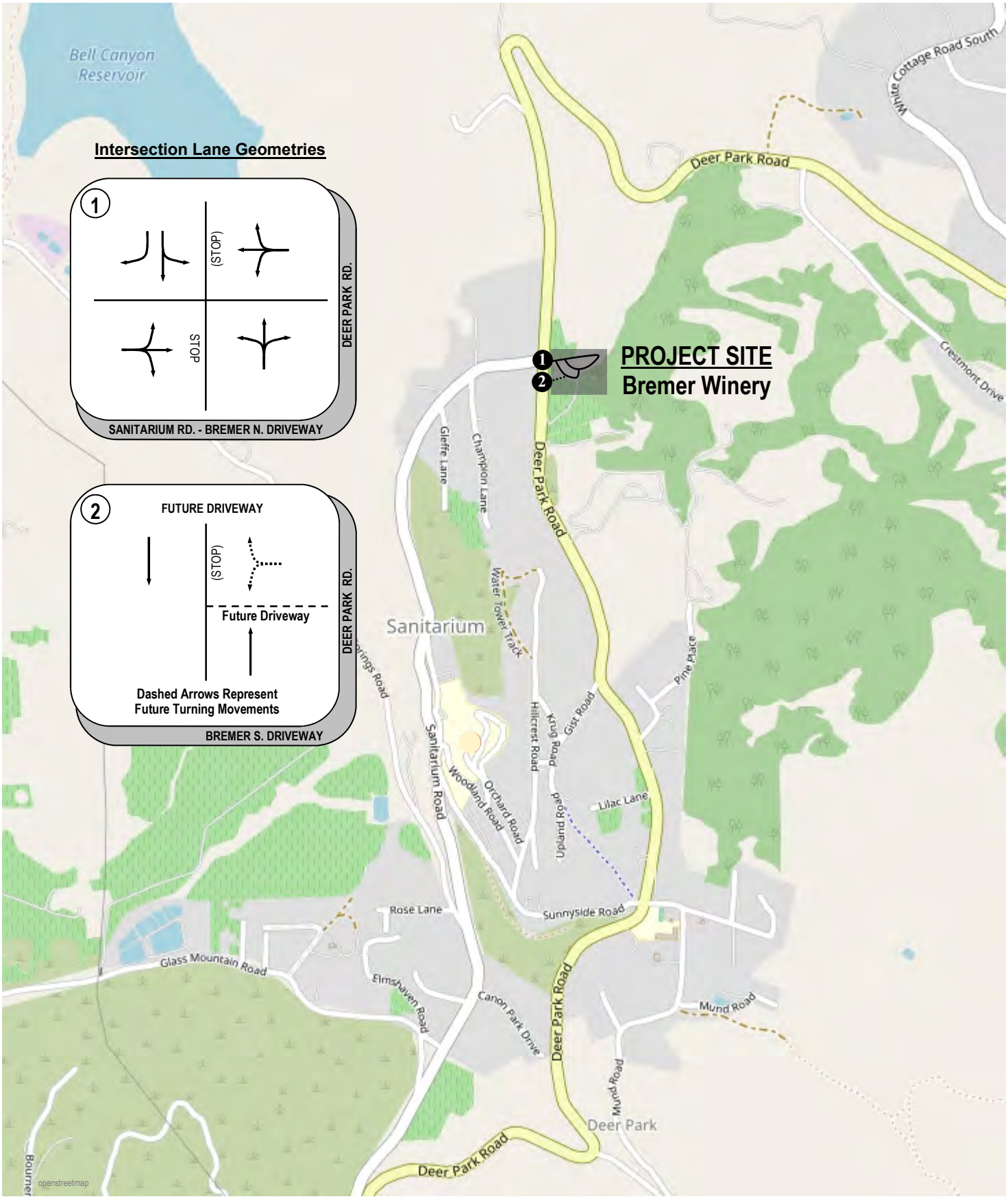
Based on Updated Napa County transportation guidelines, potential project impacts would represent the increase from current use permit activities and proposed project use modification changes. The resulting net increase in proposed project daily trip generation will guide how overall impacts are assessed and aide County staff for the proposed project's environmental review.

Using recent Napa County transportation guidelines that include TIA/VMT/TDM policies (Napa County 2022), GHD has analyzed existing, near-term (approved), and cumulative conditions with and without the proposed project. In addition, a vehicle collision analysis has been conducted focusing on Deer Park Road and Sanitarium Road at primary access intersection(s) and the along adjacent roadway segments. Project site access, circulation, and vehicle sight distance have been evaluated using County standards. Previous data and analyses conducted as part of the *Focused Traffic Analysis for the Proposed Bremer Family Winery Use Modification Project* (*Omni-Means, 2018*) has been incorporated into the draft document (to the extent possible). Consistent with County guidelines, proposed project vehicle miles traveled (VMT) was identified with recommended transportation demand management (TDM) measures.

The following key transportation components associated with project activities and transportation operations were evaluated:

- Existing Conditions (Year 2023) with/without Project: Weekday PM peak hour and weekend (Saturday) mid-day peak hour operations at the Deer Park Road/Sanitarium Road/Bremer Family Winery Driveway intersection and Deer Park Road segments;
- Near-Term (2025) with/without Project. Operating conditions reflecting other approved/pending projects in the study area encompassing Napa County and the City of St. Helena;
- Net increase in proposed project trip generation from current CEQA basis conditions to proposed project use modification conditions including production, visitation, employment, and marketing events based on accepted Napa County trip generation ratios;
- Estimated increase in project vehicle miles travelled (VMT) using recommended vehicle trips length from the Napa County transportation guidelines;
- Project site access at the winery's Deer Park Road driveway and proposed southerly driveway and circulation of vehicles within the winery areas;
- Cumulative year 2030 with/without project using growth projections along Deer Park Road based on the Napa County General Plan Update EIR;

[6] Napa County PBES, Bremer Family Winery, P22-00086 Traffic Impact Study Scope of Services, Memorandum, Sayed Fakhry, PE, TE, TJKM Transportation Consultants, October 24, 2022.



GHD

PROJECT VICINITY MAP

FIGURE 1.1

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- Transportation Demand Management (TDM) plans to reduce overall vehicle trip lengths and trip generation tailored to specific Winery activities related to visitation and employment as well as other recommended County strategies.

Executive Summary/Mitigation: Based on the findings of the operational analysis for the proposed Bremer Family Winery Use Modification project, mitigation measures are recommended to provide acceptable operations during the design peak hour conditions. Mitigations may include, but are not limited to, signalization, lane geometry changes/additions, travel lane requirements, signage and striping, additional gate service lanes, transportation demand measures, and turn restrictions/wayfinding.

The following scenarios were evaluated for transportation analyses of the Northwest Field Gate:

- Existing Conditions (Year 2022)
- Existing plus Project Conditions
- Near-Term (Year 2025) No-Project Conditions
- Near-Term (Year 2025) plus Project Conditions
- Cumulative Year 2030 No-Project Conditions
- Cumulative Year 2030 plus Project Conditions

1.1 Project Description

Using the proposed project's most recent County use permit (major modification) application for winery uses, the activities anticipated to increase over existing levels include the following:

- The annual number of visitors would increase from 3,600 persons per year to 12,500 persons per year;
- There would be no change to the maximum daily and weekly number of visitors. Maximum daily visitation would remain unchanged at 70 persons per day and 490 persons per week;
- Winery production would increase by 35,000 gallons from 15,000 gallons per year to 50,000 gallons per year;
- There would be just seven (7) marketing events per year as follows:
    - Two (2) annual events with up to 100 guests
    - Three (3) annual events with up to 50 guests
    - Two (2) annual events with up to 25 guests;
- Employment would increase by four employees from four (4) full-time employees to eight (8) full-time employees. Part-time employment would remain unchanged at two (2) employees.

In addition to the increases listed above associated with proposed Winery activities, overall circulation and access at the Winery would be modified to allow more direct flow through the winery grounds and a dispersal of project trips. Specifically, a secondary driveway (new) would be installed approximately 185-feet south of the existing main Bremer Family Winery driveway on Deer Park Road (see Section 7---Site Access/Design Parameters).

2. Transportation Network

2.1 Project Setting

This section outlines both the roadway, intersection, pedestrian/bicycle network that provides both direct and indirect access to the Bremer Family Winery, and collision history at the primary study intersection/roadway. The Winery is located at 975 Deer Park Road immediately east of the Deer Park Road/Sanitarium Road intersection. Silverado Trail and State Route 29 (SR 29) can be accessed 1-2 miles west via Deer Park Road. A brief description of each roadway follows:

2.1.1 Roadways:

Deer Park Road extends between Silverado Trail and Howell Mountain Road in the project study area in a northeast-southwest direction. A two-lane rural collector street with short radius curves (in places) due to elevation changes and topography, Deer Park Road provides access to the Deer Park and Sanitarium areas as well as Angwin further east of the project site. In the immediate project vicinity, the Deer Park roadway segment is straight with a speed limit of 45 mph.

Sanitarium Road parallels Deer Park Road to the west and has both a southerly and northerly connection to the roadway. Located approximately 0.40 miles north of Silverado Trail at Deer Park Road, Sanitarium Road extends for approximately 1.6 miles before re-connecting with Deer Park Road. At its northern intersection with Deer Park Road, Sanitarium Road extends in an east-west direction and form the west leg of the intersection (off-set from the Bremer Family Winery driveway by about 25 feet). Sanitarium Road is a two-lane road that provides access to institutional (medical), residential, and agricultural areas with a speed limit of 35 mph.

Silverado Trail is located approximately 1.2 miles southwest of the proposed project site and is one of the two primary north-south routes providing access through the Napa Valley. A two-lane rural throughway, Silverado Trail provides access to agricultural, winery, and commercial areas on the east side of the Napa Valley. Extending from the City of Napa north through St. Helena, Silverado Trail eventually extends to Calistoga with a 50-mph speed limit in the study area.

State Route 29 (SR-29) is the primary north-south route through the Napa Valley extending from the City of Vallejo north to the City of Calistoga. The highway varies from four travel lanes (between Vallejo and Yountville) narrowing to two travel lanes north of Yountville. This two-lane roadway configuration continues for the remainder of the highway. In the project study area at Deer Park Road SR-29 has two travel lanes and wide shoulder areas with a 45-mph speed limit.

2.1.2 Intersections

To update existing peak hour traffic operating conditions, new peak period multi-model counts were conducted at the Bremer Family Winery driveway at Deer Park Road intersection in January 2022[7]. Based on Napa County guidelines, vehicle counts were conducted during the Friday PM commute period and a Saturday peak afternoon period at the following intersection:

- Deer Park Road/Sanitarium Road/Bremer Family Winery Driveway

The County requires two Friday intersection counts (4:00-6:00 p.m.) and two Saturday afternoon (1:00-3:00 p.m.) counts that are then averaged to provide a representative sampling of traffic flow volumes. The resultant “peak hour” of traffic flow on Deer Park Road occurs during 4:00-5:00 p.m. (Friday) and 1:00-2:00 p.m. (Saturday). Traffic count data has been included in **Appendix A.** Peak period counts were conducted during the non-harvest/crush season (late January) and do not fully reflect peak traffic conditions on Deer Park Road. Therefore, Napa County guidelines indicate existing count volumes will be increased by 15% to represent harvest season conditions.[8] Existing (adjusted) AM and PM peak hour intersection volumes are shown in **Figure 2.1**.

[7] All Traffic Data Systems, Peak period intersection counts at the Deer Park Road/Sanitarium Road/Bremer Family Winery Driveway, Fridays (January 13 & 20, 2023) & Saturdays (January 14 & 21, 2023).
[8] Napa County PBES, Napa County Traffic Impact Study (TIS) Guidelines, February 2022.

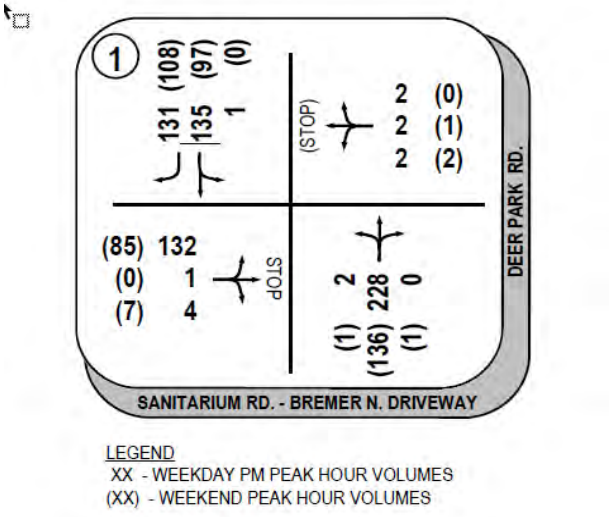


Figure 2.1 Existing Weekday PM and Weekend Midday Peak Hour Intersection Volumes

2.1.3 Intersection Field Observations

The primary Bremer Family Winery project driveway is slightly off-set from Sanitarium Road by approximately 15-20 feet on the east side of Deer Park Road However, the close proximity of the driveway to Sanitarium Road mimics the operation of a four-way intersection at this location. Both Sanitarium Road and the Bremer Family Winery driveway are minor street, stop-sign controlled approaches at Deer Park Road. The project entrance driveway is gated approximately 25 feet from the main roadway and has a travel width of about 16 feet. After passing through the gated entrance, the driveway extends east to provide access to parking, winery and residential areas. Napa County standards require a minimum driveway width of 20-feet. However, consistent with Napa County Roads and Street standards, a large wide gravel parking area (turn-out) extends along the north side of the driveway to provide for turnouts and for two-way traffic. In addition, a circular internal drive provides both motorists and delivery trucks opportunity to access the winery grounds without conflict for ingress/egress.

2.1.4 Average Daily Traffic (ADT) Volumes

In addition to intersection count volumes, ADT (24-hour) two-way roadway segment volumes were collected on Deer Park Road south of Sanitarium Road. Again, existing ADT volumes were increased by 15% to account for harvest season conditions. As recorded, the Deer Park Roadway segment is currently carrying 3,215 daily vehicles.

2.1.5 Pedestrians/Bicycles

Based on the rural nature of Deer Park Road and Sanitarium Road and their distance from the Valley floor, observed pedestrian and bicycle facilities in the project study area were limited in nature. Based on field observations during data collection, there are no pedestrian/bicycle facilities on either roadway in the project study area. Deer Park Road and Sanitarium Road have no shoulders, curb or gutter, or sidewalks in the project vicinity. Pedestrian and bicycle counts conducted at the Deer Park Road/Sanitarium Road/Bremer Family Winery driveway intersection indicate very light use by non-motorized multi-modal uses. Specifically, 1 bicyclist and zero pedestrians on Deer Park Road were counted during the AM peak period with no bicyclists or pedestrians recorded during the PM peak period as shown in **Table 2.1**.

Table 2.1 Pedestrian and Bicycle Volumes, Friday PM and Saturday Midday Peak Hours

#	Intersection	Control Type	PM Peak Hour Pedestrian/Bicyclists	MD Peak Hour Pedestrian/Bicyclists
1	Deer Park Rd./Sanitarium Rd./BFW Driveway	TWSC	1	0

Source: GHD, PM and Midday peak hour pedestrian/bicycle count data, Deer Park Road-Sanitarium Road, January 20,21, 2023.

2.1.6 Transit

Transit service in the regional area is currently provided by The Vine and is operated by the Napa Valley Transportation Authority (NVTA). The Vine operates both fixed-route and "flex route" service that provides access encompassing the City of Napa and other major towns along Highway 29 including Yountville, St. Helena, and Calistoga. . Currently, there is no direct transit service in the project vicinity along Deer Park Road. However, The Vine does operate flexible service routes and para-transit routes in St. Helena with "on-demand" door-to-door services within ¾ of a mile of St. Helena. However, no direct or on-demand transit service currently extends to the project study area.

2.2 Collision Analysis

A collision analysis was conducted for the study area to determine any trends or patterns that may indicate a safety issue at adjacent intersections and roadways in the study area. Collision rates are calculated based on records provided by the California Highway Patrol as published in their State-wide Integrated Traffic Records System (SWITRS) database. The most current five (5) year period from January 1, 2017, through December 31, 2021, was analyzed. Collision characteristics and rates for the primary existing Deer Park Road/Sanitarium Road/Bremer Family Winery driveway intersection is shown in **Table 2.2**.

There were no fatal or severe injury collisions recorded for the study location in the past five years. In addition, the calculated collision rate for the study location was compared to the average collision rate for similar facilities state-wide, as indicated in the *2019 Collision Data on California State Highways* (Caltrans). As presented in **Table 2.2**, the Deer Park Road/Sanitarium Road/Bremer Family Winery driveway intersection is experiencing a collision rate higher than the 2019 California Average for similar facilities. The majority of collisions (5) were either "rear-end" or "broadside." These types of collisions are consistent with minor-street, stop-sign control intersections and the relatively high vehicle speed limit on Deer Park Road. It is noted that vehicle sight distance is adequate along Deer Park Road from the minor streets (see Section 7—Site Access/Design Parameters).

Table 2.2 Study Intersection Collision Analysis

Intersection ID	Intersection	By Severity					By Type							By Year					Bicycle Involved Collisions	Pedestrian Involved Collisions	**Total Collisions** (2017-2021)	**24-Hr Entering Volume**	**Collision Rate** (Per Million Entering Vehicles)	**CA Average Collision Rate** (Per Million Entering Vehicles)
		Fatal	Severe Injury	Injury (Other Visible)	Injury (Complaint of Pain)	Property Damage Only	Head-On	Sideswipe	Rear End	Broadside	Hit Object	Vehicle/Pedestrian	Other	2017	2018	2019	2020	2021						
1	Deer Park Rd / Sanitarium Rd - Bremer Driveway	0	0	1	4	2	0	0	3	2	1	1	0	2	1	1	1	2	0	1	7	5390	**0.71**	0.36

In addition to intersection collision analysis, roadway segment collision analysis was also evaluated for Deer Park Road 1,000 feet north and south of Sanitarium Road. As shown in **Table 2.3,** the roadway segment experienced two (2) collisions over the past five years with a calculated collision rate below the State average. Both recorded collisions involved property damage only.

Table 2.3 Roadway Segment Collision Analysis

Segment ID	Roadway Segment	Fatal	Severe Injury	Injury (Other Visible)	Injury (Complaint of Pain)	Property Damage Only	Head-On	Sideswipe	Rear End	Broadside	Hit Object	Vehicle/Pedestrian	Other	2017	2018	2019	2020	2021	Bicycle Involved Collisions	Pedestrian Involved Collisions	**Total Collisions** (2017-2021)	**24-Hr Entering Volume**	**Collision Rate** (Per Million Vehicle Miles)	**CA Average Collision Rate** (Per Million Vehicle Miles)
1	Deer Park Rd: 1,000' N & S of Sanitarium Rd	0	0	0	0	2	0	1	1	0	0	0	0	1	0	0	0	1	0	0	2	3217	**0.90**	1.29

2.3 Analysis Methodologies

Operational design standards are established using information in the Napa County Traffic Impact Study (TIS) Guidelines (Napa County, 2022), Napa Valley General Plan Circulation Element (Napa County, 2019) and the Highway Capacity Manual (HCM), Sixth Edition (TRB, 2016) for intersection capacities.

2.3.1 Intersection LOS Methodologies

Level of Service (LOS) was calculated for all intersection control types using the methods documented in the HCM, Sixth Edition (TRB, 2016). Level of service is a qualitative measure of traffic operating conditions, whereby a letter grade “A” through “F” is assigned to an intersection or roadway segment representing progressively worsening traffic conditions.

For two-way stop-controlled (TWSC) and/or “T-type” intersections such as the Deer Park Road/Sanitarium Road/Bremer Family Winery driveway, the intersection delay and LOS are represented by the stop-sign controlled approach (worst case) and is expressed in seconds of vehicle delay with a corresponding LOS range.

All unsignalized intersection operations analyses are conducted using procedures and methodologies contained in the HCM (TRB, 2016). These methodologies are applied using the Synchro/SimTraffic simulation software (Version 11).

2.3.2 Operational Design Standards

Operational design standards for acceptable intersection operations are based on the Napa County Traffic Impact Study (TIS) Guidelines. Should intersection operations be forecasted to perform below acceptable LOS and standards, measures are recommended to improve operations to acceptable LOS and standards as follows:

Intersections:

- The operational analyses of unsignalized intersections are considered substandard if project-related traffic would cause the worst approach (i.e., greatest delay) at an intersection to operate at LOS E or worse during one or more peak hours.

All study intersections were analyzed at a threshold of LOS D. Refer to **Table 2.4** for the intersection Level-of-Service descriptions and LOS criteria for signalized and unsignalized intersections based on Transportation Research Board (TRB, 2016).

Bicycle Facilities:

- The operational analysis of bicycle facilities is considered substandard if the project would result in potentially hazardous conditions for bicyclists or otherwise would substantially interfere with bicycle accessibility to the project site and adjoining areas.

Pedestrian Facilities

- The operational analyses of pedestrian facilities are considered substandard if the project would result in substantial overcrowding on sidewalks, would create potentially hazardous conditions for pedestrians or otherwise would substantially interfere with pedestrian accessibility to the project site and adjoining areas.

Table 2.4 Intersection Level-of-Service (LOS) Delay Criteria

Level of Service	Type of Flow	Delay	Maneuverability	Stopped Delay/Vehicle		
				Signalized	Unsignalized	All-Way
A	Stable Flow	Very slight delay. Progression is very favorable, with most vehicles arriving during the green phase not stopping at all.	Turning movements are easily made and nearly all drivers find freedom of operation.	<10.0	<10.0	<10.0
B	Stable Flow	10.0Good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average delay.	Vehicle platoons are formed. Many drivers begin to feel somewhat restricted within groups of vehicles.	>10.0 and <20.0	>10.0 and <15.0	>10.0 and <15.0
C	Stable Flow	Higher delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant, although many still pass through the intersection without stopping.	Back-ups may develop behind turning vehicles. Most drivers feel somewhat restricted	>20.0 and <35.0	>15.0 and <25.0	>15.0 and <25.0
D	Approaching Unstable Flow	The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volume-to-capacity ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable	Maneuverability is severely limited during short periods due to temporary back-ups.	>35.0 and <55.0	>25.0 and <35.0	>25.0 and <35.0
E	Unstable Flow	Generally considered to be the limit of acceptable delay. Indicative of poor progression, long cycle lengths, and high volume-to-capacity ratios. Individual cycle failures are frequent occurrences.	There are typically long queues of vehicles waiting upstream of the intersection.	>55.0 and <80.0	>35.0 and <50.0	>35.0 and <50.0
F	Forced Flow	Generally considered to be unacceptable to most drivers. Often occurs with over saturation. May also occur at high volume-to-capacity ratios. There are many individual cycle failures. Poor progression and long cycle lengths may also be major contributing factors.	Jammed conditions. Back-ups from other locations restrict or prevent movement. Volumes may vary widely, depending principally on the downstream back-up conditions.	>80.0	>50.0	>50.0

2.3.3 Technical Parameters for Intersection Operations

The following technical parameters were developed for this study:

- A Peak Hour Factor (PHF) will be calculated based on the traffic counts conducted for this study for each analysis location and the HCM (TRB, 2016). Intersection PHF's are used for existing and design year conditions. A default PHF of 0.93 is used for Design Year conditions and/or calculated PHF (whichever is more conservative).
- Peak hour truck percentages were calculated based on Heavy Vehicle counts conducted as part of the Deer Park Road intersection data collection and/or 5% based on County direction (GHD, 2022).
- Speeds on Deer Park Road (used for intersection analysis) are based on the current posted speed limit.

- Deer Park Road mainline lane width of 11' will be used in the analysis.
- The intersection saturation flow rate is assumed to be 1,900 passenger cars per hour per lane based on the HCM (TRB, 2016).

All parameters not listed above should be assumed as default or calculated values based on the HCM (TRB, 2016).

2.4 Existing Intersection Operations

2.4.1 Intersection Level-of-Service

Existing weekday AM and PM peak hour study intersection operation were quantified using existing traffic volumes and existing lane geometry and control. Table 2.3 presents intersection operations for Existing Conditions. Detailed Synchro calculation sheets are included in **Appendix B**.

As presented in **Table 2.5**, the two-way-stop-controlled (TWSC) intersection of Deer Park Road/Sanitarium Road/Bremer Family Winery Driveway is currently operating at acceptable LOS D or better during the PM peak hour and Saturday Midday peak hour.

Table 2.5 Existing Intersection Level-of-Service (LOS), Weekday PM Peak & Weekend Midday Peak Hour

ID	Intersection	Peak Hour	Target LOS	Existing		
				Control	Delay	LOS
1	Deer Park Rd./Sanitarium Rd./Bremer Family Winery Driveway	PM	D	TWSC	14.2	B
		MD	D		11.2	B
BOLD Indicate LOS of E or worse 1 Intersection LOS based on Synchro-Simtraffic (Version 11.0); 2 Delay reported from HCM 6 (TRB, 2016) methodology, TWSC = Two-Way-Stop-Control, PM = Friday Weekday Peak, MD = Saturday Midday Peak						

2.4.2 Signal Warrant Evaluation

Based on the California Manual on Uniform Traffic Control Devices (CAMUTCD) peak hour signal warrant criteria, the unsignalized Deer Park Road/Sanitarium Road study intersection was evaluated for signalization.[9] The peak hour warrant(s) is one of several standards to help determine if installation of a traffic signal is appropriate. Qualifying for signalization using the peak hour warrants does not necessarily mean a signal should be installed. The decision to install a traffic signal should be based on further studies utilizing additional warrants as presented in the CAMUTCD. At this time, the project study intersection does not qualify for signalization under the peak hour warrant (the warrant graphs are provided in the **Appendix C**).

[9] California Manual on Uniform Traffic Control Devices (CAMUTCD), Chapter 4C, Peak hour signal warrant (#3), 2014 Edition (Revised March 27, 2020).

3. Near-Term (No Project) Conditions

3.1.1 Methodology

Both near-term conditions (approved, no project) and cumulative volume projections for Deer Park Road and Sanitarium Road were reviewed from the Solano - Napa Activity Based Model (SNABM). Using the growth in volumes between 2015 and 2040 in Napa County, overall growth would increase by 64% over a 25-year period or 2.56% per year.[10] Near-Term (No Project) conditions represent an approximate 2-year period (Year 2025) to allow for completion of approved projects.

In addition to the SNABM traffic growth projections, local approved/pending projects in the immediate study area have been included in overall traffic growth based on Napa County TIS Guidelines. Based on direction from Napa County Planning staff, there is oneongoing development project that could affect traffic volumes along Deer Park Road and Sanitarium Road that include the following:

- **Aloft Winery (P16-00429)**—430 Cold Springs Road, Angwin. Approximately 3.3 miles northeast of the project site, new winery with an annual production of 50,000 gallons, 6 full-time employees and 2 part-time employees, average of 20 visitors per day, with an average marketing event of 125 guests;

3.1.2 Near-Term (Approved Project) Trip Generation

Based on Napa County's Winery Trip Generation Worksheet for use modifications, the approved project's daily and peak hour vehicle trips have been calculated as follows:

Aloft Winery.	Weekday: 139 daily trips, 15 PM peak hour trips
	Weekend: 131 daily trips, 19 Midday peak hour trips

Approved project trip generation sheets are included in **Appendix D.**

The approved project site is located northeast of the proposed project site in the Angwin area. Excluding local traffic associated with employment, deliveries, and visitation; the majority of traffic flow would be to/from the southwest via Deer Park Road and Sanitarium Road. Peak hour approved project trips were assigned to the roadways based on existing traffic flows at the Deer Park Road/Sanitarium Road intersection.

Near-term (No Project) volumes for the weekday (Friday) PM peak hour and weekend (Saturday) midday peak hour are shown in **Figure 3.1**

3.1.3 Near-Term (No Project) Roadway/Intersection Operations

With Near-Term (No Project) volumes, roadway segment volumes on Deer Park Road would increase to 276 vehicles (southbound directional) reflecting operations of LOS A.

Intersection LOS at the Deer Park Road/Sanitarium Road/Bremer Winery Driveway has been calculated and shown in **Table 3.1.** As calculated, vehicle delays would remain unchanged from Existing (No Project) conditions remaining at LOS B during both the weekday PM and weekend midday peak hour conditions.

[10] Solano Transportation Authority (STA) | Napa Valley Transportation Authority (NVTA, Solano Napa Activity – Based Model (SNABM), Model Documentation, Table 28, August 27, 2020.

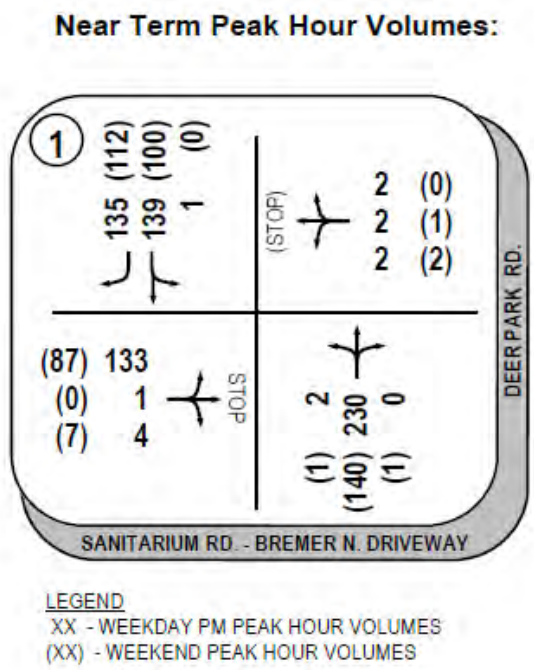


Figure 3.1 Near-Term (No Project) Weekday PM & Weekend Midday Peak Hour Intersection Volumes

Table 3.1 Near-Term (No Project) Intersection Level-of-Service (LOS), Weekday PM Peak & Weekend Midday Peak Hour

ID	Intersection	Peak Hour	Target LOS	Existing			Near-Term (NP)		
				Control	Delay	LOS	Control	Delay	LOS
1	Deer Park Rd./Sanitarium Rd./Bremer Family Winery Driveway	PM	D	TWSC	14.2	B	TWSC	14.4	B
		MD	D		11.2	B		11.3	B
BOLD Indicate LOS of E or worse 1 Intersection LOS based on Synchro-Simtraffic (Version 11.0); 2 Delay reported from HCM 6 (TRB, 2016) methodology, TWSC = Two-Way-Stop-Control, PM = Friday Weekday Peak, MD = Saturday Midday Peak									

3.1.4 Signal Warrant Evaluation

With Near-Term (No Project) volumes, the unsignalized Deer Park Road/Sanitarium Road study intersection was evaluated for signalization.[11] At this time, the project study intersection does not qualify for signalization under the peak hour warrant (the warrant graphs are provided in the **Appendix C**).

4. Cumulative Year 2030 (No Project) Conditions

4.1.1 Methodology

Cumulative Year 2030 (No Project) volume projections for Deer Park Road and Sanitarium Road were reviewed from the Solano - Napa Activity Based Model (SNABM). Using the growth in volumes between 2015 and 2040 in

[11] California Manual on Uniform Traffic Control Devices (CAMUTCD), Chapter 4C, Peak hour signal warrant (#3), 2014 Edition (Revised March 27, 2020).

Napa County, overall growth would increase by 64% over a 25-year period or 2.56% per year.[12] Existing traffic volumes were increased by 17.92% to account for an approximate 7-year growth period (Year 2030) consistent with the Napa County General Plans

Cumulative Year 2030 (No Project) volumes for the weekday (Friday) PM peak hour and weekend (Saturday) midday peak hour are shown in **Figure 4.1**

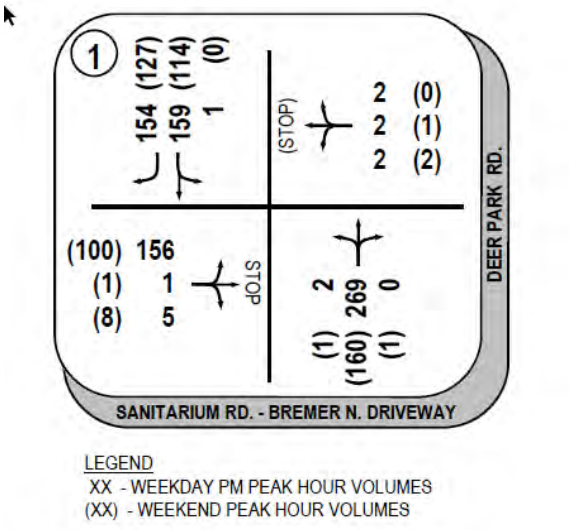


Figure 4.1 Cumulative Year 2030 (No Project) Weekday PM & Weekend Midday Peak Hour Intersection Volumes

4.1.2 Cumulative Year 2030 (No Project) Roadway/Intersection Operations

With Cumulative Year 2030 (No Project) volumes, arterial LOS would remain unchanged on Deer Park Road reflecting operations of LOS A.

Intersection LOS at the Deer Park Road/Sanitarium Road/Bremer Winery Driveway has been calculated and shown in **Table 4.1.** As calculated, vehicle delays would increase slightly changing from LOS B to LOS C during the weekday PM peak hour. Weekend (Saturday) midday peak hour conditions would remain at LOS B.

Table 4.1 Cumulative Year 2030 (No Project) Intersection LOS, Weekday PM Peak & Weekend Midday Peak Hour

ID	Intersection	Peak Hour	Target LOS	Existing			Near-Term (NP)			Cumulative Yr. 2030 (No Project)		
				Control	Delay	LOS	Control	Delay	LOS	Control	Delay	LOS
1	Deer Park Rd./Sanitarium Rd./Bremer Family Winery Driveway	PM	D	TWSC	14.2	B	TWSC	14.5	B	TWSC	16.8	C
		MD	D		11.2	B		11.4	B		11.9	B
2	Deer Park Rd./Bremer Family South Driveway	PM	D									
		MD	D									

BOLD Indicate LOS of E or worse

1 Intersection LOS based on Synchro-Simtraffic (Version 11.0);

2 Delay reported from HCM 6 (TRB, 2016) methodology, TWSC = Two-Way-Stop-Control, PM = Friday Weekday Peak, MD = Saturday Midday Peak

4.1.3 Signal Warrant Evaluation

With Cumulative Year 2030 (No Project) volumes, the unsignalized Deer Park Road/Sanitarium Road study intersection was evaluated for signalization.[13] At this time, the project study intersection does not qualify for signalization under the peak hour warrant (the warrant graphs are provided in the **Appendix C**).

[12] Solano Transportation Authority (STA) | Napa Valley Transportation Authority (NVTA, Solano Napa Activity – Based Model (SNABM), Model Documentation, Table 28, August 27, 2020.

[13] California Manual on Uniform Traffic Control Devices (CAMUTCD), Chapter 4C, Peak hour signal warrant (#3), 2014 Edition (Revised March 27, 2020).

5. Napa County Significance Criteria

The County of Napa's significance criteria has been based on the Napa County Traffic Impact Study (TIS) Guidelines (*Napa County, 2022*). Some of the key significance criteria applicable to proposed project development would be as follows as described in Table 5 of the TIS Guidelines:

On-Site Circulation

- Site design for circulation, access, and/or parking areas fail to meet County Road and Street Standards or industry standard design guidelines;
- A project fails to provide adequate or safe accessibility for service and delivery trucks on-site (including access to truck loading areas) or for passenger drop-off and pick-up areas.

Off-Site Traffic Operations

- Per Attachment B, a roadway segment or intersection operates acceptably according to Policy CIR-38 under a no project scenario, and the addition of project traffic causes overall traffic operations on the facility to operate unacceptably;
- A roadway segment or intersection operates unacceptably according to Policy CIR-38 under a no project scenario and the project adds a certain amount of traffic;
- Project-generated Vehicle Miles Traveled (VMT) exceeds the standards described in the General Plan Policy CIR-7.

Intersection Traffic Control

- The addition of project traffic causes an all-way-stop-controlled or side-street stop-controlled intersection to meet Caltrans signal warrant criteria. All such intersections will first be evaluated with roundabout intersection control. The project team should also consider potential right-of-way constraints at intersections where roundabouts are being considered.

Expanding on significance criteria for roadway segments and intersections, the following Level-of-Service (LOS) criteria would apply:

Unsignalized Intersections:

- LOS D or better deteriorates to LOS E or F with Project Trips; or
- LOS E or F, and Project trips increases the total entering volume by one percent or more. For side-street stop-controlled intersections, based on the delay for each stop-controlled approach that operates at LOS E or F

Arterial

- LOS D or better deteriorates to LOS E or F with Project Trips; or
- LOS E or F, and Project trips increases the total segment volume by one percent or more.

Cumulative

- Project contributes five percent or more to total growth in volume entering at failing intersections;
- Project contributes five percent or more to total growth in volume on a failing arterial road segment.

Vehicle Miles Traveled (VMT)

The County identifies "screening" criteria for small winery projects that generate less than 110 net new daily trips as follows:

A Project modifying an existing facility that would generate additional trips where the net cumulative result of all project modifications after January 1, 2022 would generate less than 110net new daily passenger vehicle and truck trips

- Project is not required to prepare a TIS
- Project is presumed to have a less-than-significant environmental impact for VMT

- Applicant is encouraged to describe the measures they are taking and/or plan to take that would reduce the Project's trip generation and/or VMT

Based on initial project modification estimates, it is likely the proposed project's use modification would qualify for the County's reasonable VMT screening approach (see Section 8--VMT)

6. Project Impacts

6.1 Project Description/Purpose

Based on the most recent detailed project description for the Bremer Family Winery, the use permit modification will involve moderate increases in wine production and employment with no increase in the maximum number of daily and weekly visitation. In addition, the Winery's marketing plan would be modified to hold seven (7) annual events consistent with current Winery activities. Proposed project access to/from Deer Park Road would be modified to allow for alternative vehicle access driveway to aide in dispersing overall driveway volumes associated with Winery activities. Specific project components can be described as follows:

Production: Annual production increase from 15,000 gallons/year to 50,000 gallon/year;

Employment: Existing: 4 full-time, 2 part-time, Future: 8 full-time, 2 part-time;

Visitation: Annual visitation increase from 3,600 persons to 12,500 persons. No increase in maximum or weekly visitation of 70 persons per day or 490 person per week (7 days/week)

Marketing: Annual marketing activity would total seven (7) events: two (2) events with 100 guests, three (3) events with 50 guests, and two (2) events with 25 guests.

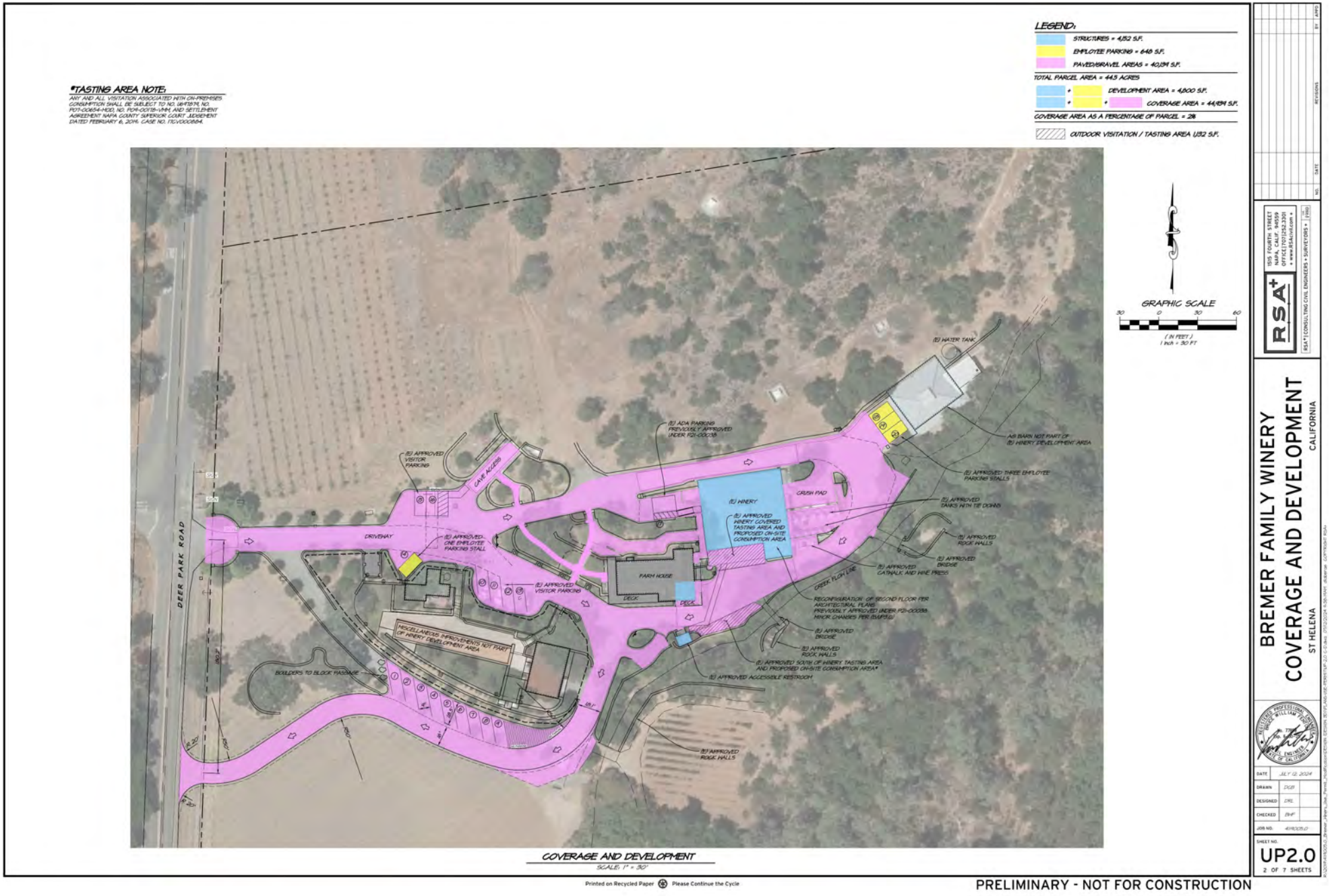
Daily operations for the proposed Bremer Family Winery project would involve an all on-site winery operation with a maximum annual production of 50,000 gallons. All fruit would be processed on-site during the year with the majority occurring during the harvest/crush season. A maximum of 70 daily visitors is expected during the Monday-Sunday period. Maximum weekly visitation for tours and tastings would not exceed 490 guests per week and would be monitored by winery staff (as they currently do now). Visitor hours would be limited between 10:00 a.m.–5:00 p.m. and would be by appointment only. Employment would increase by four (4) full-time employees. There would be no increases in part-time employment. Finally, marketing events would be limited in nature with only seven (7) annual events. The largest of these events would be held twice per year with 100 guests. In addition, the Winery participates in other off-site industry and County-wide events including the Napa Valley Auction, Napa Valley Film Festival, and other such events. Specific Bremer Family Winery marketing events would be held outside of normal peak weekday and weekend travel periods starting at 11:00 a.m. and extending through 10:00 p.m. to encourage off-peak ingress/egress.

To provide facility upgrades, a conceptual design has been developed for coverage and development purposes as shown in **Figure 6.1**.- **Project Site Plan**. As shown, a new project driveway would be provided on Deer Park Road approximately 185-feet south of the main Bremer Family Winery driveway (opposite Sanitarium Road). To improve vehicle access and safety at the main Bremer Family Winery driveway, all vehicle flow would be inbound to the Winery from Deer Park Road and Sanitarium Road. All outbound Winery traffic would use the new south driveway to access out onto Deer Park Road. Please refer to Section 7 (Site Access/Design Parameters).

6.2 Project Trip Generation

Based on proposed Use Modifications associated with Bremer Family Winery activities, the total net increase in weekday and weekend daily and peak hour traffic volumes have been calculated and are shown in **Table 6.1.** Daily and peak hour trip generation has been based on the most recent Napa County PBES Winery Trip Generation Worksheets (see **Appendix E**). County daily and peak hour trip ratios account for production, visitation, employment, and marketing components associated with proposed use modification activities.

Project trip generation has been based on the approximate 6-11 week harvest season (worst case), the proposed project is expected to generate an average of 16 weekday (Friday) daily trips with 5 PM peak hour trips. During the weekend (Saturday), the project would generate 4 daily trips with 2 midday peak hour trips. On an annual basis, the project is estimated to generate 3,646 net new trips per year. It is noted that a discussion of proposed project vehicle miles traveled (VMT) as a result of use modification activities is provided in Section 8—VMT.



COVERAGE AND DEVELOPMENT
SCALE: 1" = 30'

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PRELIMINARY - NOT FOR CONSTRUCTION

GHD

PROJECT SITE PLAN

FIGURE 6.1

N

Table 6.1 Bremer Family Winery Daily and Peak Hour Trip Generation

Net New Trips	Harvest	Non-Harvest
Maximum Weekday Traffic (Friday)		
Net New Weekday Daily Trips	16	13
Net New Weekday Peak Hour Trips	5	4
Maximum Weekend Traffic (Saturday)		
Net New Weekend Daily Trips	4	0
Net New Weekend Peak Hour Trips	2	1
Maximum Annual Traffic		
Net New Annual Trips	3,646	

Source: Napa County Planning, Building, Environmental Services (PBES), Use Permit/Major Modification Application, Winery Trip Generation Worksheets, Weekday and Weekend Daily and Peak Hour Trip Generation, March 2021 (Appendix C).

6.3 Project Trip Assignment

Based on observed turning percentages at the Deer Park Road/Sanitarium Road/Bremer Family Winery driveway intersection during both the weekday PM peak hour and Saturday mid-day peak hours; project trips were distributed 75% to/from the south on Deer Park Road and 25% to/from the west on Sanitarium Road. It is noted that no project traffic volumes were assigned to/from the north on Deer Park Road. Discussions with the project applicant indicate few if any visitation trips have been recorded coming to/from the north on Deer Park Road.[14] Unless winery guests actually live in the vicinity of White Cottage Road and/or the Angwin area, 100% of guest visitation originates through the Napa Valley via Deer Park Road and Sanitarium Road and this is confirmed by actual traffic count data at the project driveway based on recent count date (Year 2023) and historical date (Year 2017) that indicate no project-generated traffic to/from the north

Existing plus Project Friday PM peak hour and Saturday midday peak hour trips have been shown in **Figure 6.2**

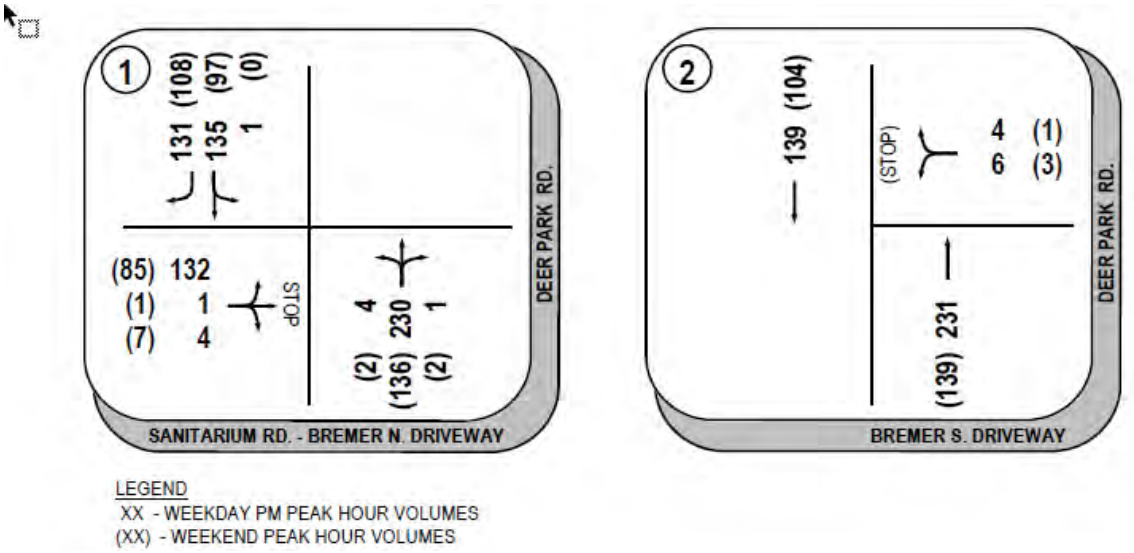

Figure 6.2 Existing plus Project Friday PM & Saturday Midday Peak Hour Intersection Volumes

[14] Mr. John Bremer, Bremer Family Winery, personal communication, Guest visitation patterns, August 15, 2017.

6.4 Project Effects on Roadway/Intersection LOS

6.4.1 Existing Plus Project Conditions

Upon project completion, the fully operational winery would be expected to generate approximately 12 additional daily trips south of the site on Deer Park Road and 4 daily trips west of the site on Sanitarium Road. This would represent a net increase of less than 1% to the daily volumes on Deer Park Road. The combined existing plus project arterial directional volume of 278 on Deer Park Road would continue to operate equivalent to LOS A.

During the peak winery activity periods, the winery would generate 5 PM peak hour weekday trips with 4 trips using Deer Park Road to/from the south and 1 trips using Sanitarium Road. During the Saturday mid-day peak hour the project would generate 2 midday peak hour trips with via Deer Park Road to/from the south and Sanitarium Road to the west. Weekday Friday PM peak hour and weekend Saturday mid-day peak hour intersection levels of service were evaluated with proposed project traffic and are shown in **Summary Table 6.2.**

As shown in Table 4, the proposed Bremer Family Use Modification project would continue to allow intersection operation of LOS B or better during both the Friday PM peak and Saturday midday peak hours.

Table 6.2 Summary Table: Existing, Near-Term, and Cumulative Year 2030 "Plus Project" Intersection LOS

ID	Intersection	Peak Hour	Target LOS	Existing Plus Project			Near-Term Plus Project			Cumulative Yr. 2030 Plus Project		
				Control	Delay	LOS	Control	Delay	LOS	Control	Delay	LOS
1	Deer Park Rd./Sanitarium Rd./Bremer Family Winery Driveway	PM	D	TWSC	14.3	B	TWSC	14.4	B	TWSC	16.8	C
		MD	D		11.1	B		11.2	B		11.8	B
2	Deer Park Road / Bremer Family Winery South Driveway	PM	D	TWSC	10.5	B	TWSC	10.5	B	TWSC	11	B
		MD	D		9.8	A		9.8	A		10.1	B

BOLD Indicate LOS of E or worse

1 Intersection LOS based on Synchro-Simtraffic (Version 11.0);

2 Delay reported from HCM 6 (TRB, 2016) methodology, TWSC = Two-Way-Stop-Control, PM = Friday Weekday Peak, MD = Saturday Midday Peak

6.4.2 Near-Term Plus Project Conditions

Near-Term Plus Project weekday Friday PM peak hour and weekend Saturday midday peak hour volumes are shown in **Figure 6.3**

With Near-Term plus Project conditions, roadway ADT and LOS would continue to operate at acceptable levels. Upon project completion, the fully operational winery would be expected to generate approximately 12 additional daily trips south of the site on Deer Park Road and 4 daily trips west of the site on Sanitarium Road. The combined Near-Term plus Project arterial directional volume of 276 on Deer Park Road would continue to operate equivalent to LOS A.

As shown in **Summary Table 6.2**, the proposed Bremer Family Use Modification project would continue to allow intersection operation of LOS B or better during both the Friday PM peak and Saturday midday peak hours with Near-Term Plus Project volumes.

6.4.3 Cumulative Year 2030 Plus Project Conditions

Cumulative Year 2030 Plus Project weekday Friday PM peak hour and weekend Saturday midday peak hour volumes are shown in **Figure 6.4**

With Cumulative Year 2030 Plus Project conditions, roadway arterial LOS would continue to operate at acceptable levels. Arterial (southbound directional) volumes on Deer Park Road would increase to 338 vehicles with an LOS of A.

As shown in **Summary Table 6.2**, the proposed Bremer Family Use Modification project would continue to allow intersection operation of LOS C or better during both the Friday PM peak and Saturday midday peak hours with Cumulative Year 2030 Plus Project volumes.

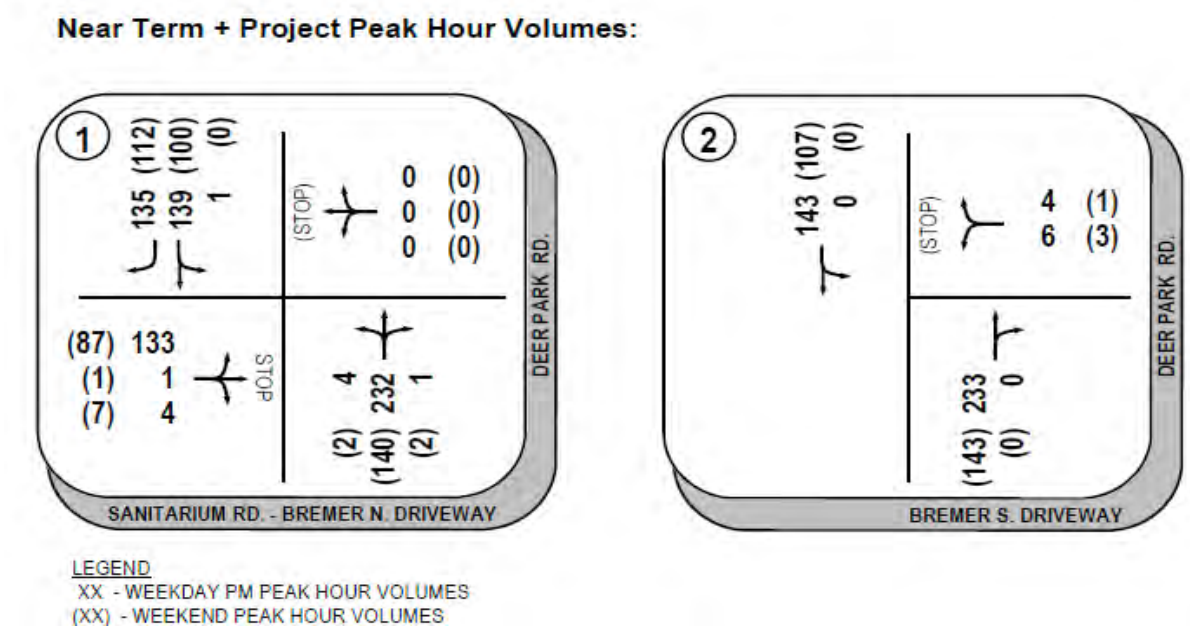

Figure 6.3 Near-Term Plus Project Friday PM & Saturday Midday Peak Hour Intersection Volumes

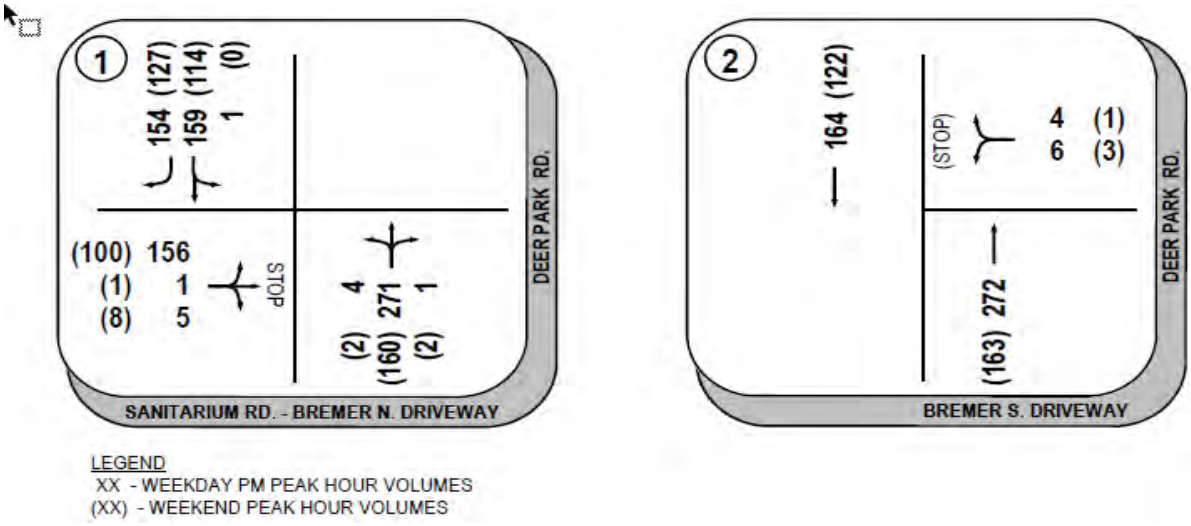

Figure 6.4 Cumulative Year 2030 Plus Project Friday PM & Saturday Midday Peak Hour Intersection Volumes

6.4.4 Signal Warrant Evaluation

Under all "with project" scenarios that in Existing, Near-Term, and Cumulative Year 2030 volumes, the unsignalized Deer Park Road/Sanitarium Road study intersection would not qualify for signalization using the peak hour warrant criteria.[15] In addition, the new south Bremer Family Winery driveway at Deer Park Road would not qualify with proposed project volumes. (the warrant graphs are provided in the **Appendix C**).

7. Site Access/Design Parameters

7.1 Driveway Access

With proposed Use Modifications, driveway access for the Bremer Family Winery would be modified to allow improved circulation to/from Deer Park Road as well as from on-site areas. Specifically, a new driveway is proposed to be constructed approximately 185-feet south of the existing Bremer Family Winery driveway that

[15] California Manual on Uniform Traffic Control Devices (CAMUTCD), Chapter 4C, Peak hour signal warrant (#3), 2014 Edition (Revised March 27, 2020).

would connect to the on-site internal drive. As shown in **Figure 6.1** (Project Site Plan), the new driveway would extend from the south on-site parking area west to Deer Park Road. The installation of a second driveway would serve to provide three purposes:

1. Disperse project-generated daily and peak hour vehicle trips;
2. Remove conflicting turning movements from the primary Bremer Family Winery driveway at its intersection with Deer Park Road-Sanitarium Road;
3. Provide more uniform traffic flow within the project site with clear inbound/outbound direction.

With the new south Bremer Family Winery driveway, all vehicle flow to the project site would be inbound from the primary (existing) project driveway opposite Sanitarium Road and out via the new driveway. This vehicle flow would serve to remove all outbound trips (westbound) from project site at the Deer Park Road/Sanitarium Road/Bremer Family Winery intersection. All outbound project trips would use the new south Bremer Family Winery driveway to access Deer Park Road in a north or south direction. In order to enforce directional turning movements and provide wayfinding for the inbound and outbound Winery driveways at Deer Park Road, the following measures are recommended for motorists approaching the project driveways from Deer Park Road:

- An "**Entrance Only**" sign should be placed at the main Bremer Family Winery driveway opposite Sanitarium Road;
- An "**Exit Only**" sign should be placed at the planned South Bremer Family Winery driveway.

It is noted that similar applications have been used in Napa Valley where one-way loop roads/driveways exist. A prime example would the existing limited access driveways serving the Oakville Grocery where similar signage exists.

7.1.1 Vehicle Sight Distance

Vehicle sight distance for the existing Bremer Family Winery driveway was evaluated as part of prior draft transportation analysis for the proposed project (*Omni-Means/GHD, June 2018*). The required vehicle visibility or "corner sight distance" is a function of travel speeds on Deer Park Road. Caltrans design standards indicate that for appropriate corner sight distance, "a substantially clear line of sight should be maintained between the driver of a vehicle waiting at the crossroad and the driver of an approaching vehicle in the right lane of the main highway". Caltrans design guidelines also indicate that the minimum corner sight distance "shall be equal to the stopping sight distance" where possible.

Radar speed surveys of Deer Park Road were conducted for the roadway in the project area.[16] The "critical" vehicle speed (the speed at which 85% of all surveyed vehicles travel at or below) along Deer Park Road was measured at 52 mph at the project driveway. The posted speed limit in the project driveway area is 45 mph. Caltrans' design standards indicate that these vehicle speeds require a stopping sight distance of 450-460 feet both north and south of the driveway measured along the travel lanes of Deer Park Road.[17] Based on field measurements, sight distance from the Bremer Family Winery driveway to the north on Deer Park Road is approximately 490 feet. Sight distance from the existing driveway to the south is in excess of 650 feet. Therefore, the sight distance recommendations would be met for the speed limit and measured vehicle speeds.

Extending to the proposed south Bremer Family Winery driveway at Deer Park Road; the driveway would be located approximately 185-feet south of the existing primary Winery driveway opposite Sanitarium Road. Given a measured sight-distance in excess of 650-feet from the existing Winery driveway would allow for 465-feet of vehicle sight-distance from the new south Winery driveway which would be adequate based on Caltrans requirements.

7.1.2 Left-Turn Lane Requirements

Existing plus Project volumes were compared with the Napa County guidelines for installing a southbound left-turn lane on Deer Park Road at the Bremer Family Winery driveways.[18] Napa County left-turn lane warrants are based on the combination of total proposed project *average* daily trips at the driveway and overall *average* daily volumes on Deer Park Road.

[16] Omni Means Engineers & Planners, Radar vehicle speed surveys, Deer Park Road, February 10, 2017.
[17] Caltrans, Highway Design Manual, Table 405.1A, Corner (Stopping) Sight Distance, July 1, 2020.
[18] Napa County Road and Street Standards, PBES, Chapter 17, Traffic Control Devices, Left-Turn Lane Graph, 2023.

As noted in the Project Description, the project would increase overall yearly visitation from 3,600 guests to 12,500 guests per year. Based on 12,500 visitors; visitation would average 34 guests per day over the course of the year. The average daily visitor total of 34 guests reflects the Winery's true activities and acknowledges that it will rarely host the maximum daily total of 70 visitors given the changing seasons, location, and overall marketing of the Winery. However, based on recent Napa County Engineering direction, the project's maximum projection of 70 daily visitors has been used to evaluate the proposed project's left-turn lane warrant requirement.[19] In addition, all daily inbound/outbound project trip generation has been focused at one project access driveway rather than the planned two access driveways.

Napa County daily trip generation ratios for full-time/part-time employees, daily visitors, and production/grape haul for the weekday (Friday—worst case) conditions have been used to calculate all winery-related activities. In addition to proposed Winery activities, there are two (2) on-site residences that would be served by the same project driveways at Deer Park Road. These residences include an existing farmhouse and a 1-bedroom second dwelling unit. Based on accepted Institute of Transportation Engineers (ITE) daily trip rates for single-family homes and Napa County guidelines, each residence would generate 10 daily trips. Total average daily trip generation for proposed project uses and on-site residences has been calculated in **Table 7.1**.

Table 7.1 Average Daily Project Trip Generation

Project Use Components	Friday	Daily Trip Generation Ratio (Napa County)	Component Daily Trips	Total Weekday Daily Trips
Daily Full-Time Employees	8	3.05 one-way trips/employee	FT employee daily trips:	24.4
Daily Part-Time Employees	2	1.90 one-way trips/employee	PT employee daily trips:	3.80
Maximum Visitors[1]	70	2.6 visitors/vehicle x 2 one-way trips	Visitor daily trips:	53.8
Maximum Event	0	2.6 visitors/vehicle x 2 one-way trips	Event daily trips:	0
Gallons of Production	50000	0.000018 truck trips	Production daily trips:	0.90
Tons of Grape Haul	312.5	0.013889 truck trips	Grape haul daily trips:	4.30
Residences	2	10 trips/residence	Residential daily trips:	20.0
			Total Weekday Trips	**107.2**

Source: Napa County, PB&ES, Winery Trip Generation Sheet, Daily trip generation ratios, 2022.
1. Maxim daily visitors based on proposed Winery visitation of 70 guests per day (Friday) and 2.6 guests per vehicle x 2 one-way trips = 53.8.

As shown in **Table 7.1**, the proposed project would be expected to generate 107.2 (or 108) daily trips during the weekday Friday period. The peak daily trip total of 108 would equate to 54 daily trips (inbound and outbound) at the Deer Park Road north driveway. Combined with 3,323 ADT on Deer Park Road (Existing plus Project Conditions), a southbound left-turn lane would be warranted on Deer Park Road at the north Sanitarium Road/Bremer Family Winery driveway based on County ADT warrant requirements (see **Appendix F**—Left-Turn Lane Warrant Graph).

In addition to the County left-turn lane volume warrant, proposed project visitation patterns and project trip distribution are also worth consideration when evaluating installation of a left-turn lane at the main (northern) project driveway as follows:

Southbound Left-Turn Volumes on Deer Park Road at the Bremer Family Driveway: Based on weekday Friday PM peak period (4:00-6:00 p.m.) and Saturday mid-day peak hour (1:00-3:00 p.m.) counts conducted at the Sanitarium Road-Bremer Family Winery Driveway/Deer Park Road; one (1) southbound left-turn movement was observed at the Bremer Family Winery driveway from Deer Park Road. Based on discussions with the project applicant, all guest visitation originates from the Napa Valley area via Deer Park Road. Visitors and guests to the winery do not typically originate from areas to the north via Deer Park Road (White Cottage Road, Angwin, & Howell Mountain Road). The vast majority of guests use Deer Park Road to/from the south and/or Sanitarium Road to/from the west to access the proposed project site. Consequently, there would be virtually no demand for a southbound left-turn lane on Deer Park Road at the Bremer Family Winery north driveway.

7.1.3 Internal Circulation

With the proposed project site plan, the existing Bremer Family Winery project driveway from Deer Park Road would be improved from existing conditions to County standards for emergency vehicle access (see Project Site Plan---Figure 6.1). The main project driveway would extend east from Deer Park Road approximately 500 feet and provide access to winery production and storage areas (to the east). As noted, all vehicle traffic traveling to the Winery would be inbound from the existing Bremer Family Winery driveway (opposite Sanitarium Road). Approximately 200-feet east of Deer Park Road, the internal driveway would split; the eastward internal leg would

[19] Anna Vickroy, PE, TE, TJKM Consultants, Bremer Family Winery, P22-00086, Conditions of Approval, Comment memorandum, August 21, 2024.

extend another 300 -feet to Winery production areas before looping around to re-join the southeast leg of the driveway. The southeast leg would extend past Winery parking areas (to the Farmhouse) before turning southwest back towards Deer Park Road. This internal loop road allows vehicles to circulate through the site to access parking areas located off the driveway and in the southeast portion of the site adjacent to vineyard areas. The vehicle circulation area in front of the main winery tasting buildings would allow access for emergency vehicles (fire trucks) and parking areas south these winery facilities. The internal southwest segment of the loop road would provide access to new guest parking areas before extending west to Deer Park Road approximately 185-feet south of Sanitarium Road.

The Napa Countywide Bicycle Plan has been completed and adopted by the Napa Valley Transportation Authority (NVTA) and the County.[20] The plan encourages new developments to incorporate bicycle friendly design. Deer Park Road is designated as a Class III bike route from Silverado Trail past the proposed project site. It is expected that some visitors may occasionally arrive by bicycle to access the proposed project. The project would provide bicycle racks for visitors to the proposed winery.

8. Vehicle Miles Traveled (VMT)

The following VMT guidelines and recommendations are sited directly from the Napa County Traffic Study (TIS) Guidelines (*Attachment C—VMT Analysis Approach for Development Projects in Napa County*).[21]

8.1.1 VMT Policies

The County's General Plan Circulation Element contains a policy statement (Policy CIR-7) indicating that the County expects development projects to achieve a 15% reduction in project-generated VMT to avoid triggering a significant environmental impact. Specifically, the policy directs project applicants to identify feasible measures that would reduce their project's VMT and to estimate the amount of VMT reduction that could be expected from each measure. The policy 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."

That policy is followed by an action item (CIR-7.1) directing the County to update its CEQA procedures to develop screening criteria for projects that "would not be considered to have a significant impact to VMT" and that could therefore be exempted from VMT reduction requirements. The approach outlined here includes a set of screening criteria intended to comply with this action item.

8.1.2 Baseline VMT Screening Process

It is common that an existing facility, whether a winery or another type of use, may apply to the County for some type of modification. Modifications may involve expansion of operating hours or of production quantities, changes to the number of events or visitors permitted, construction of new or expanded buildings, modifications to existing buildings to allow for more intensive use, and so on. In many cases, the requested modification would trigger more vehicle trips to/from the project site.

For the purposes of VMT analysis, the County will consider the baseline trip generation for all existing facilities to be the trip generation of the facility under entitled operating characteristics as of January 1,2022. When an existing facility applies for a modification, the trip generation associated with that modification will be calculated as the change between the facility's entitled operations on January 1, 2022and the expected operations once the proposed modification is complete.

At any point in the future, if the facility has added more than 110 daily passenger vehicle trips, during any period beyond the level of its trip generation on January 1, 2022, then it will be subject to the "VMT Analysis Requirements for Projects Based on Trip Generation" described below. Please note that crossing this threshold of adding 110 daily passenger vehicle trips may occur in the first project modification requested after January 1, 2022, or it may occur after multiple project modifications which will be treated cumulatively.

Given the largely rural nature of Napa County, a reasonable screening approach is to apply a combination of the concepts and guidelines expressed in both the OPR Technical Advisory and the Napa County TIS

[20] Napa County, Countywide Bicycle Plan (2019), Planning Area-North Valley, May 2019.
[21] Napa County PBES, Napa County Traffic Impact Study Guidelines, Attachment J, February 2022.

Guidelines. Development projects proposed in Napa County can use the following structure to determine what level of VMT analysis will be required:

A Project modifying an existing facility that would generate additional trips where the net cumulative result of all project modifications after January 1, 2022 would generate less than 110 net new daily passenger vehicle and truck trips.

a. Project is not required to prepare a TIS

b. Project is presumed to have a less-than-significant environmental impact for VMT

c. Applicant is encouraged to describe the measures they are taking and/or plan to take that would reduce the Project's trip generation and/or VMT

Based on the above Napa County VMT analysis and criteria, the proposed project is calculated to generate 16 net new daily trips on a weekday (maximum) and satisfies all requirements to be screened out and not require VMT analysis.

9. Transportation Demand Management (TDM)

TDM Plan

The following measures are suggested and/or occurring to further reduce the demand of vehicles to/from the site. Given the nature of the proposed Use Modification with small increases in employment and no increases in daily guest visitation, large TDM measures are not practical given the location overall size of the Winery operations. However, specific TDM measures are described in some detail below.

Tours and Tastings/Marketing Events:

- When smaller marketing events are being held at the Winery (25-50 guests), the combination of tours/tastings and marketing event shall not exceed 70 daily visitors.
- When large marketing events occur twice per year (100 guests), 25 tours/tasting visitors shall be allowed on those days. However, all marketing event guests will be transported to/from the Winery via hire car (buses and/or vans) on that day. In addition, tours and tastings shall be scheduled during the morning and early afternoon hours (10:00 a.m. – 3:00 p.m.) to avoid any conflicts with the larger marketing event that are held in the later afternoon and evening hours (see Marketing Event Operations).
- To the maximum extent feasible, scheduling of tours and tastings shall not occur during peak travel times between 4:00-6:00 p.m. (weekdays) and 1:00-3:00 p.m. (weekends).

Shuttles, Hire Car, Limousines

- To the maximum extent possible, shuttle and other high occupancy vehicles shall transport guests to marketing events or tours and tastings for groups of 15 or more persons, with all vehicles parking on-site in designated areas.

Employee/Guest Incentives:

Employees:

The project applicant indicates that all current vineyard workers currently carpool to the project site. In addition, the applicant lives within one-mile of the Winery reducing overall VMT trip lengths. The Winery applicant currently ***provides low-cost housing*** for employees both on-property and within close proximity to the Winery.

Marketing Event Operations:

The project applicant indicates that when the Winery hosts large marketing events (two events year @ 100 guests), a majority of the guests stay at local hotels in the Napa Valley.[22] The Winery then uses hire vehicles (buses and/or vans) to transport the guests safely to/from the Winery for the dinner/event. Depending on the number of vans/buses, the vehicles will stay at the Winery during the event and then transport the guests back to the hotels upon completion. The large marketing events typically occur between 7:00 p.m. and 11:00 p.m. outside

[22] John Bremer, Applicant/Owner, Bremer Family Winery, Large event transportation demand management (TDM) measures, Personal communication, April 8, 2023.

of the peak traffic flows. In addition to guest transportation, the associated catering generates four (4) truck trips; one truck arrives the day prior to the event for set-up then the day after the event for tear-down. Five (5) employees (event only) drive to the gathering. With these large 100-guest event TDM measures, it is estimated that overall trip generation is reduced to approximately 25-35 vehicle trips accounting for guest, catering, and employee activities.

In addition to the employee TDM measures currently embedded in Winery operations, the following is suggested:

- Staggered employee work hours: The winery will make efforts to have employees who do not live on-site arrive and/or depart the premises outside of the peak commute periods. For example, wine production employees would be encouraged to arrive prior to 7:00 a.m. and to depart before 3:00 p.m. (before 12:00 p.m. on the weekends). The exception would be during the crush/harvest season. Employees working in the visitor-serving capacities would be encouraged to arrive after 9:00 a.m. and depart after 6:00 p.m. (after 4:00 p.m. on weekends);
- Ride Share/Car Free Operations: The winery will make efforts to encourage ride shares and “car free” tourism as described in the program of the Napa Valley Destination Council and Napa Valley Transportation Agency.

Appendix A

Traffic Count Data

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951)268-6268

County of Napa
N/S: Deer Park Road
E/W: Sanitarium Rd/Bremer Family Winery
Weather: Clear

File Name : CNP_DP_San 1-20 PM
Site Code : 22323145
Start Date : 1/20/2023
Page No : 1

Groups Printed- Total Volume

	Deer Park Road Southbound				Bremer Family Winery Driveway Westbound				Deer Park Road Northbound				Sanitarium Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	33	25	58	0	1	1	2	1	46	0	47	29	0	1	30	137
04:15 PM	0	29	35	64	0	0	0	0	1	50	0	51	21	0	2	23	138
04:30 PM	0	32	23	55	0	0	0	0	0	47	0	47	34	0	0	34	136
04:45 PM	0	15	29	44	0	1	0	1	1	37	0	38	27	0	0	27	110
Total	0	109	112	221	0	2	1	3	3	180	0	183	111	0	3	114	521
05:00 PM	0	20	17	37	0	0	0	0	0	43	0	43	29	0	1	30	110
05:15 PM	0	15	25	40	0	0	0	0	2	33	0	35	20	0	0	20	95
05:30 PM	0	22	18	40	0	1	1	2	1	51	0	52	23	0	0	23	117
05:45 PM	0	16	21	37	0	0	0	0	0	41	0	41	30	0	0	30	108
Total	0	73	81	154	0	1	1	2	3	168	0	171	102	0	1	103	430
Grand Total	0	182	193	375	0	3	2	5	6	348	0	354	213	0	4	217	951
Apprch %	0	48.5	51.5		0	60	40		1.7	98.3	0		98.2	0	1.8		
Total %	0	19.1	20.3	39.4	0	0.3	0.2	0.5	0.6	36.6	0	37.2	22.4	0	0.4	22.8	

	Deer Park Road Southbound				Bremer Family Winery Driveway Westbound				Deer Park Road Northbound				Sanitarium Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	**33**	25	58	0	**1**	**1**	**2**	**1**	46	0	47	29	0	1	30	137
04:15 PM	0	29	**35**	**64**	0	0	0	0	1	**50**	0	**51**	21	0	**2**	23	**138**
04:30 PM	0	32	23	55	0	0	0	0	0	47	0	47	**34**	0	0	**34**	136
04:45 PM	0	15	29	44	0	1	0	1	1	37	0	38	27	0	0	27	110
Total Volume	0	109	112	221	0	2	1	3	3	180	0	183	111	0	3	114	521
% App. Total	0	49.3	50.7		0	66.7	33.3		1.6	98.4	0		97.4	0	2.6		
PHF	.000	.826	.800	.863	.000	.500	.250	.375	.750	.900	.000	.897	.816	.000	.375	.838	.944

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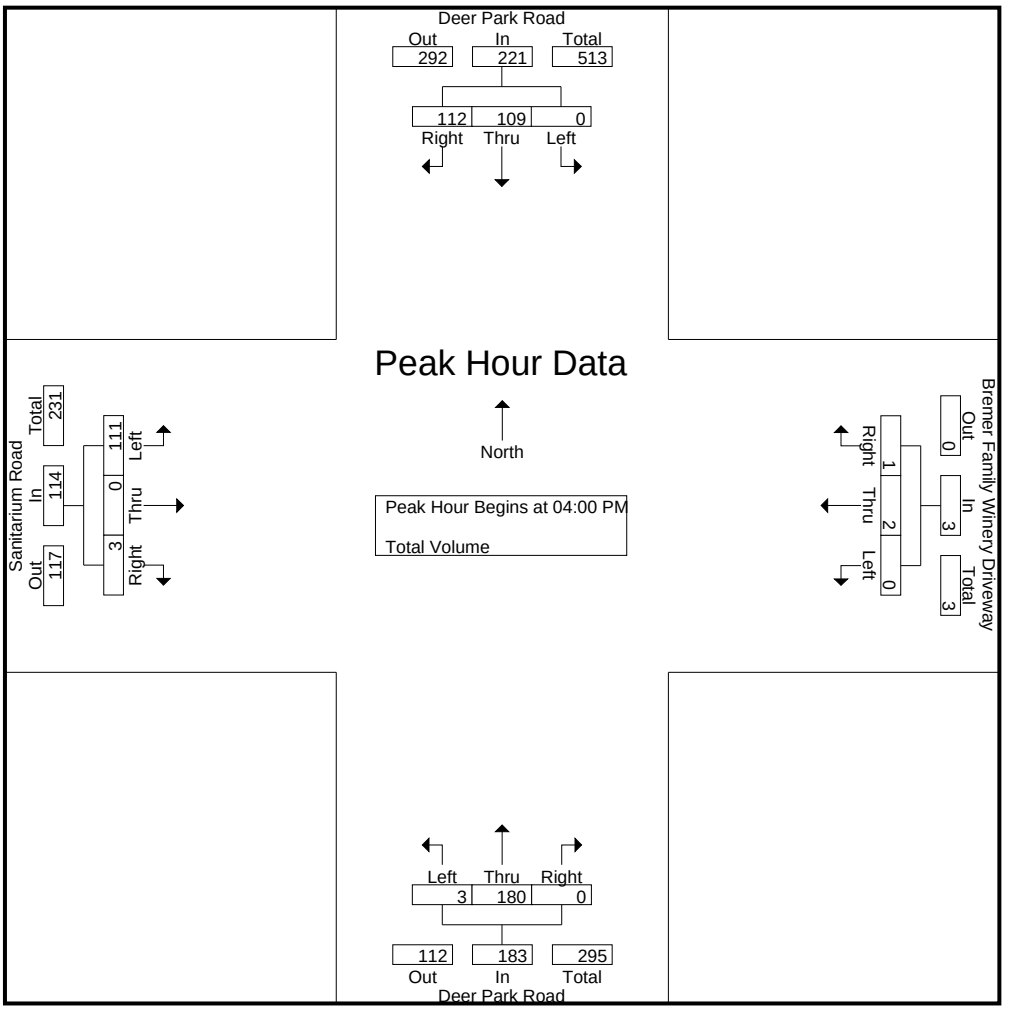
County of Napa
N/S: Deer Park Road
E/W: Sanitarium Rd/Bremer Family Winery
Weather: Clear

File Name : CNP_DP_San 1-20 PM
Site Code : 22323145
Start Date : 1/20/2023
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM				04:00 PM				04:00 PM				04:00 PM			
+0 mins.	0	**33**	25	58	0	**1**	**1**	**2**	**1**	46	0	47	29	0	1	30
+15 mins.	0	29	**35**	**64**	0	0	0	0	1	**50**	0	**51**	21	0	**2**	23
+30 mins.	0	32	23	55	0	0	0	0	0	47	0	47	**34**	0	0	**34**
+45 mins.	0	15	29	44	0	1	0	1	1	37	0	38	27	0	0	27
Total Volume	0	109	112	221	0	2	1	3	3	180	0	183	111	0	3	114
% App. Total	0	49.3	50.7		0	66.7	33.3		1.6	98.4	0		97.4	0	2.6	
PHF	.000	.826	.800	.863	.000	.500	.250	.375	.750	.900	.000	.897	.816	.000	.375	.838

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County of Napa
N/S: Deer Park Road
E/W: Sanitarium Rd/Bremer Family Winery
Weather: Clear

File Name : CNP_DP_San 1-21 MD
Site Code : 22323145
Start Date : 1/21/2023
Page No : 1

Groups Printed- Total Volume

	Deer Park Road Southbound				Bremer Family Winery Driveway Westbound				Deer Park Road Northbound				Sanitarium Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
01:00 PM	0	20	22	42	1	0	0	1	0	21	0	21	19	0	0	19	83
01:15 PM	0	20	12	32	0	0	0	0	1	27	0	28	7	0	0	7	67
01:30 PM	0	19	16	35	0	0	0	0	1	29	0	30	9	0	1	10	75
01:45 PM	0	22	18	40	1	0	0	1	1	25	1	27	22	0	0	22	90
Total	0	81	68	149	2	0	0	2	3	102	1	106	57	0	1	58	315
02:00 PM	0	22	25	47	0	0	0	0	0	21	0	21	23	0	3	26	94
02:15 PM	1	15	20	36	0	0	0	0	0	32	0	32	23	0	1	24	92
02:30 PM	0	19	24	43	0	1	0	1	0	36	1	37	18	0	2	20	101
02:45 PM	1	12	12	25	0	0	0	0	0	28	1	29	21	0	1	22	76
Total	2	68	81	151	0	1	0	1	0	117	2	119	85	0	7	92	363
Grand Total	2	149	149	300	2	1	0	3	3	219	3	225	142	0	8	150	678
Apprch %	0.7	49.7	49.7		66.7	33.3	0		1.3	97.3	1.3		94.7	0	5.3		
Total %	0.3	22	22	44.2	0.3	0.1	0	0.4	0.4	32.3	0.4	33.2	20.9	0	1.2	22.1	

	Deer Park Road Southbound				Bremer Family Winery Driveway Westbound				Deer Park Road Northbound				Sanitarium Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 01:00 PM to 02:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 01:45 PM																	
01:45 PM	0	**22**	18	40	**1**	0	0	**1**	**1**	25	**1**	27	22	0	0	22	90
02:00 PM	0	22	**25**	**47**	0	0	0	0	0	21	0	21	**23**	0	**3**	**26**	94
02:15 PM	**1**	15	20	36	0	0	0	0	0	32	0	32	23	0	1	24	92
02:30 PM	0	19	24	43	0	**1**	0	1	0	**36**	1	**37**	18	0	2	20	**101**
Total Volume	1	78	87	166	1	1	0	2	1	114	2	117	86	0	6	92	377
% App. Total	0.6	47	52.4		50	50	0		0.9	97.4	1.7		93.5	0	6.5		
PHF	.250	.886	.870	.883	.250	.250	.000	.500	.250	.792	.500	.791	.935	.000	.500	.885	.933

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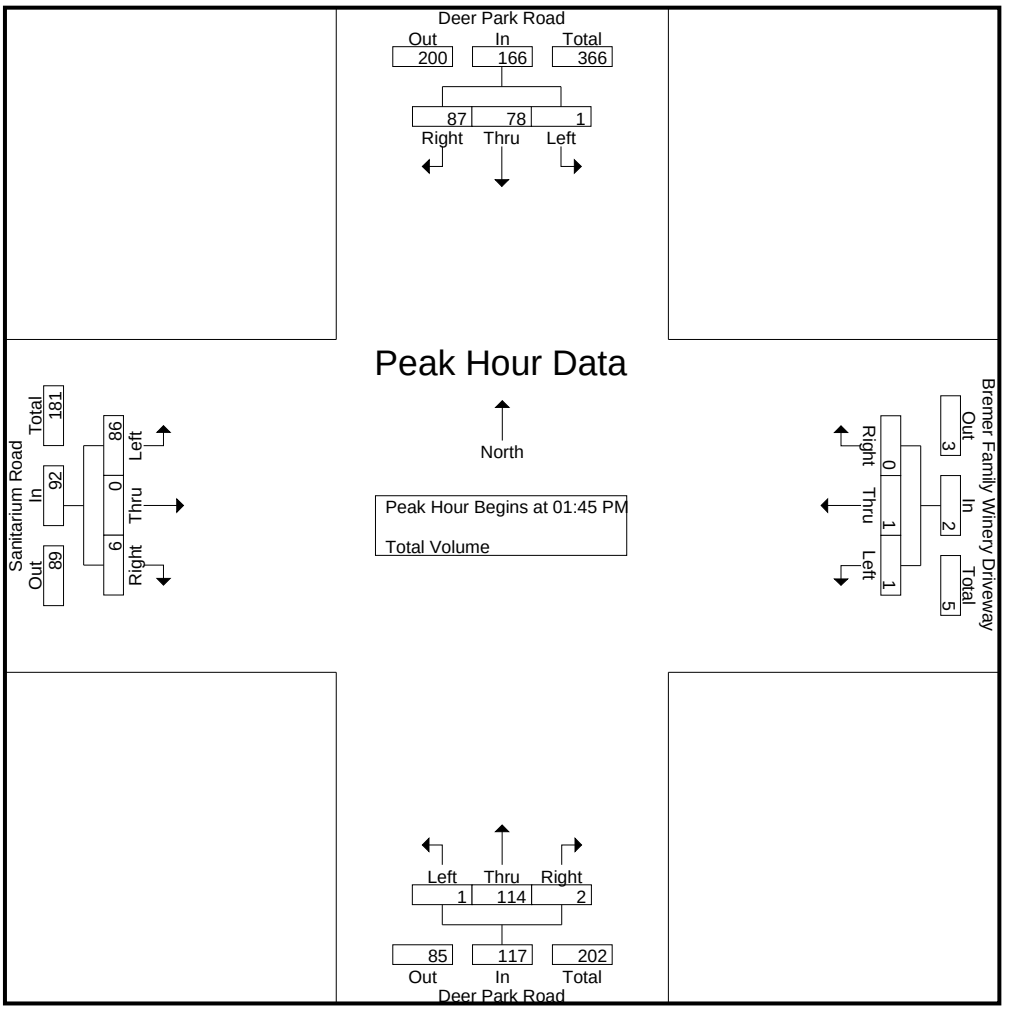

Peak Hour Analysis From 01:00 PM to 02:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	01:45 PM				01:00 PM				02:00 PM				01:45 PM			
+0 mins.	0	**22**	18	40	**1**	0	0	**1**	0	21	0	21	22	0	0	22
+15 mins.	0	22	**25**	**47**	0	0	0	0	0	32	0	32	**23**	0	**3**	**26**
+30 mins.	**1**	15	20	36	0	0	0	0	0	**36**	**1**	**37**	23	0	1	24
+45 mins.	0	19	24	43	1	0	0	1	0	28	1	29	18	0	2	20
Total Volume	1	78	87	166	2	0	0	2	0	117	2	119	86	0	6	92
% App. Total	0.6	47	52.4		100	0	0		0	98.3	1.7		93.5	0	6.5	
PHF	.250	.886	.870	.883	.500	.000	.000	.500	.000	.813	.500	.804	.935	.000	.500	.885

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County of Napa
N/S: Deer Park Road
E/W: Sanitarium Rd/Bremer Family Winery
Weather: Clear

File Name : CNP_DP_San 1-27 PM
Site Code : 22323145
Start Date : 1/27/2023

Groups Printed- Total Volume

	Deer Park Road Southbound				Bremer Family Winery Driveway Westbound				Deer Park Road Northbound				Sanitarium Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	24	23	47	0	1	0	1	0	40	0	40	20	0	2	22	110
04:15 PM	1	46	40	87	0	0	0	0	0	53	0	53	32	0	1	33	173
04:30 PM	0	32	32	64	2	0	0	2	0	66	0	66	25	0	0	25	157
04:45 PM	0	23	25	48	0	1	0	1	0	39	0	39	32	0	1	33	121
Total	1	125	120	246	2	2	0	4	0	198	0	198	109	0	4	113	561
05:00 PM	0	23	18	41	0	1	2	3	0	58	0	58	29	1	0	30	132
05:15 PM	0	21	32	53	1	0	0	1	0	44	0	44	35	0	0	35	133
05:30 PM	0	21	21	42	0	0	0	0	0	31	0	31	26	0	0	26	99
05:45 PM	0	22	18	40	0	0	0	0	0	38	0	38	32	0	0	32	110
Total	0	87	89	176	1	1	2	4	0	171	0	171	122	1	0	123	474
Grand Total	1	212	209	422	3	3	2	8	0	369	0	369	231	1	4	236	1035
Apprch %	0.2	50.2	49.5		37.5	37.5	25		0	100	0		97.9	0.4	1.7		
Total %	0.1	20.5	20.2	40.8	0.3	0.3	0.2	0.8	0	35.7	0	35.7	22.3	0.1	0.4	22.8	

	Deer Park Road Southbound				Bremer Family Winery Driveway Westbound				Deer Park Road Northbound				Sanitarium Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	**1**	**46**	**40**	**87**	0	0	0	0	0	53	0	53	**32**	0	**1**	**33**	**173**
04:30 PM	0	32	32	64	**2**	0	0	2	0	**66**	0	**66**	25	0	0	25	157
04:45 PM	0	23	25	48	0	**1**	0	1	0	39	0	39	32	0	1	33	121
05:00 PM	0	23	18	41	0	1	**2**	**3**	0	58	0	58	29	**1**	0	30	132
Total Volume	1	124	115	240	2	2	2	6	0	216	0	216	118	1	2	121	583
% App. Total	0.4	51.7	47.9		33.3	33.3	33.3		0	100	0		97.5	0.8	1.7		
PHF	.250	.674	.719	.690	.250	.500	.250	.500	.000	.818	.000	.818	.922	.250	.500	.917	.842

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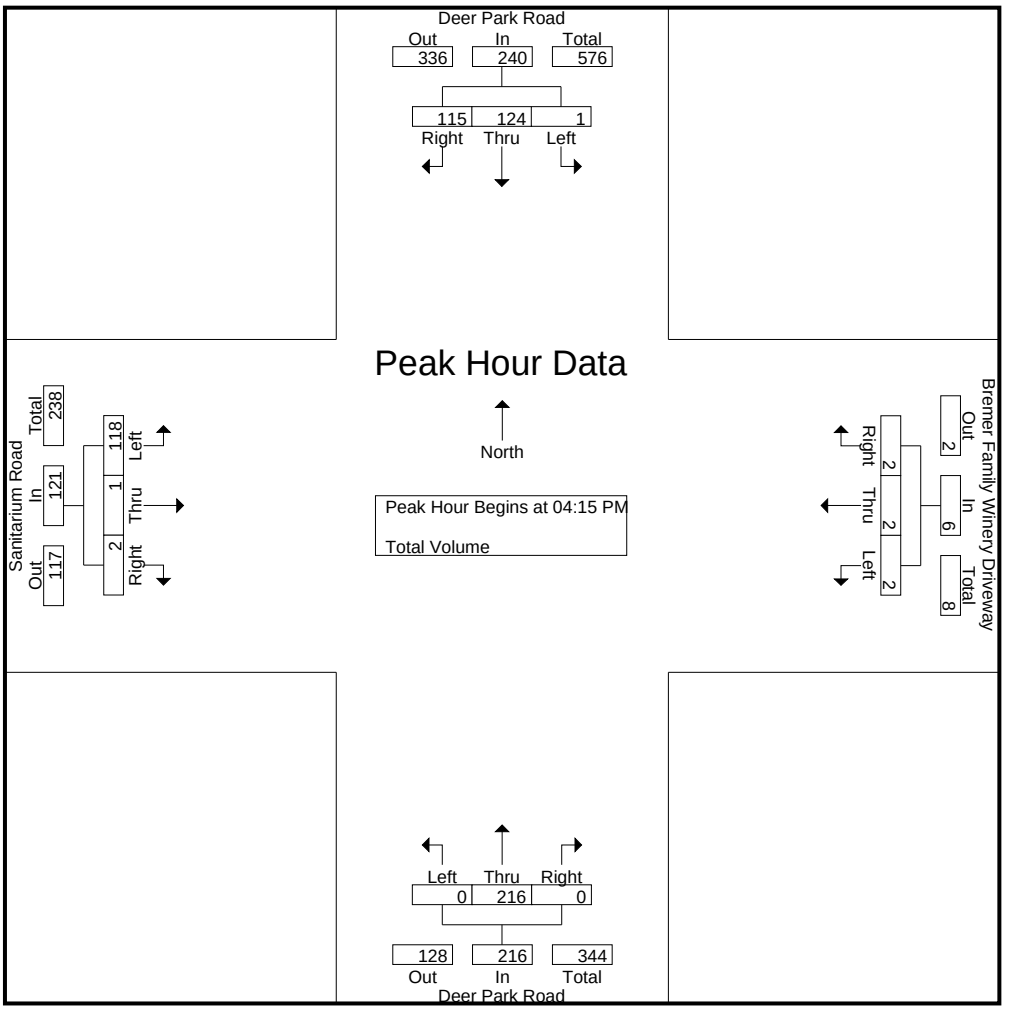
County of Napa
N/S: Deer Park Road
E/W: Sanitarium Rd/Bremer Family Winery
Weather: Clear

File Name : CNP_DP_San 1-27 PM
Site Code : 22323145
Start Date : 1/27/2023
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM				04:30 PM				04:15 PM				04:45 PM			
+0 mins.	0	24	23	47	**2**	0	0	2	0	53	0	53	32	0	**1**	33
+15 mins.	**1**	**46**	**40**	**87**	0	**1**	0	1	0	**66**	0	**66**	29	**1**	0	30
+30 mins.	0	32	32	64	0	1	**2**	**3**	0	39	0	39	**35**	0	0	**35**
+45 mins.	0	23	25	48	1	0	0	1	0	58	0	58	26	0	0	26
Total Volume	1	125	120	246	3	2	2	7	0	216	0	216	122	1	1	124
% App. Total	0.4	50.8	48.8		42.9	28.6	28.6		0	100	0		98.4	0.8	0.8	
PHF	.250	.679	.750	.707	.375	.500	.250	.583	.000	.818	.000	.818	.871	.250	.250	.886

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County of Napa
N/S: Deer Park Road
E/W: Sanitarium Rd/Bremer Family Winery
Weather: Clear

File Name : CNP_DP_San 1-28 MD
Site Code : 22323145
Start Date : 1/28/2023

Groups Printed- Total Volume

	Deer Park Road Southbound				Bremer Family Winery Driveway Westbound				Deer Park Road Northbound				Sanitarium Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
01:00 PM	0	29	29	58	1	0	0	1	0	30	0	30	18	0	1	19	108
01:15 PM	0	14	16	30	1	0	0	1	0	28	0	28	15	0	2	17	76
01:30 PM	0	26	26	52	1	0	0	1	1	36	0	37	14	0	0	14	104
01:45 PM	0	21	29	50	0	0	0	0	0	27	0	27	14	0	2	16	93
Total	0	90	100	190	3	0	0	3	1	121	0	122	61	0	5	66	381
02:00 PM	0	17	14	31	0	0	0	0	1	27	0	28	18	0	0	18	77
02:15 PM	0	14	18	32	0	0	0	0	1	17	0	18	16	0	0	16	66
02:30 PM	0	29	25	54	0	0	0	0	1	34	0	35	21	0	0	21	110
02:45 PM	0	16	22	38	0	0	0	0	0	29	1	30	17	0	1	18	86
Total	0	76	79	155	0	0	0	0	3	107	1	111	72	0	1	73	339
Grand Total	0	166	179	345	3	0	0	3	4	228	1	233	133	0	6	139	720
Apprch %	0	48.1	51.9		100	0	0		1.7	97.9	0.4		95.7	0	4.3		
Total %	0	23.1	24.9	47.9	0.4	0	0	0.4	0.6	31.7	0.1	32.4	18.5	0	0.8	19.3	

	Deer Park Road Southbound				Bremer Family Winery Driveway Westbound				Deer Park Road Northbound				Sanitarium Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 01:00 PM to 02:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 01:00 PM																	
01:00 PM	0	**29**	**29**	**58**	**1**	0	0	**1**	0	30	0	30	**18**	0	1	**19**	**108**
01:15 PM	0	14	16	30	1	0	0	1	0	28	0	28	15	0	**2**	17	76
01:30 PM	0	26	26	52	1	0	0	1	**1**	**36**	0	**37**	14	0	0	14	104
01:45 PM	0	21	29	50	0	0	0	0	0	27	0	27	14	0	2	16	93
Total Volume	0	90	100	190	3	0	0	3	1	121	0	122	61	0	5	66	381
% App. Total	0	47.4	52.6		100	0	0		0.8	99.2	0		92.4	0	7.6		
PHF	.000	.776	.862	.819	.750	.000	.000	.750	.250	.840	.000	.824	.847	.000	.625	.868	.882

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County of Napa
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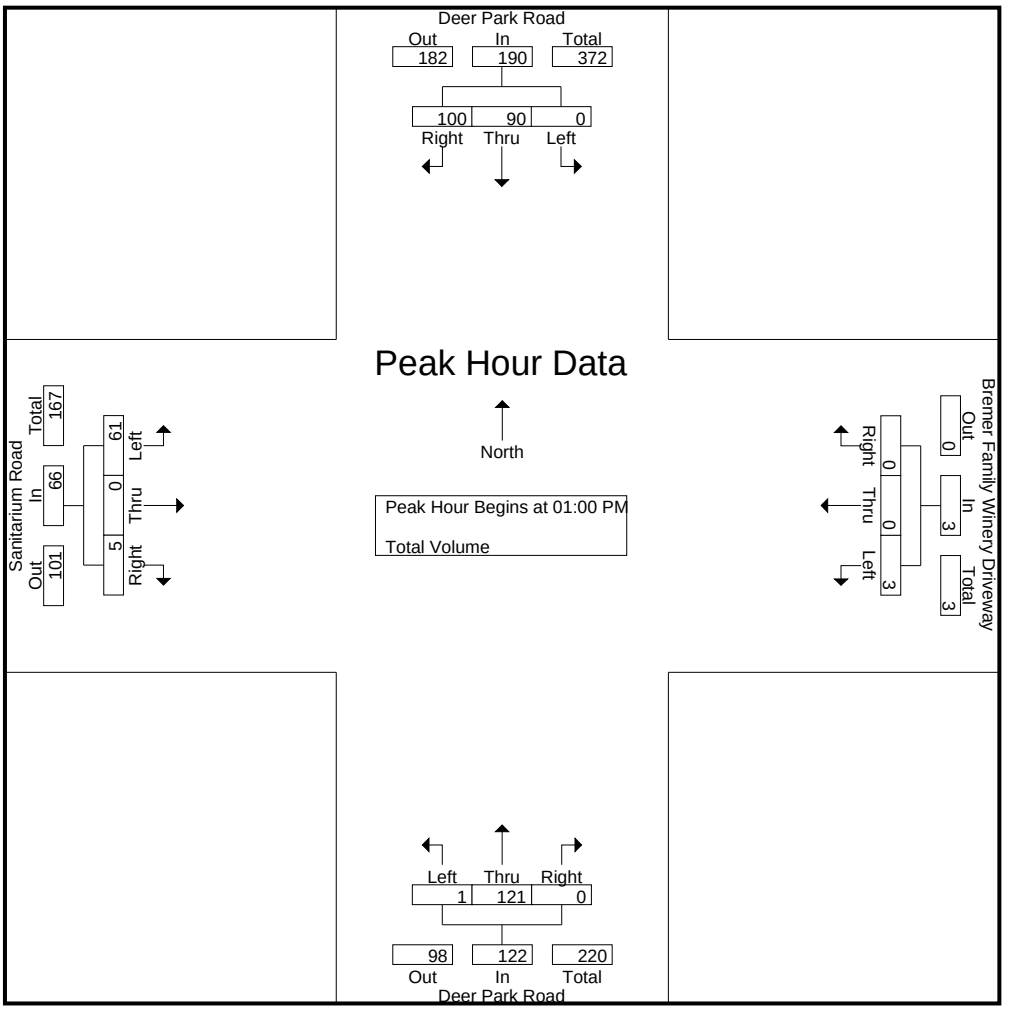
Weather: Clear

File Name : CNP_DP_San 1-28 MD
Site Code : 22323145
Start Date : 1/28/2023
Page No : 2



Peak Hour Analysis From 01:00 PM to 02:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	01:00 PM				01:00 PM				01:00 PM				02:00 PM			
+0 mins.	0	**29**	**29**	**58**	**1**	0	0	**1**	0	30	0	30	18	0	0	18
+15 mins.	0	14	16	30	1	0	0	1	0	28	0	28	16	0	0	16
+30 mins.	0	26	26	52	1	0	0	1	**1**	**36**	0	**37**	**21**	0	0	**21**
+45 mins.	0	21	29	50	0	0	0	0	0	27	0	27	17	0	**1**	18
Total Volume	0	90	100	190	3	0	0	3	1	121	0	122	72	0	1	73
% App. Total	0	47.4	52.6		100	0	0		0.8	99.2	0		98.6	0	1.4	
PHF	.000	.776	.862	.819	.750	.000	.000	.750	.250	.840	.000	.824	.857	.000	.250	.869

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County of Napa
Deer Park Road
S/ Bremer Winery Driveway / Sanitarium Road
24 Hour Directional Volume Count

CNP001
Site Code: 223-23145

Start Time	1/20/23 Fri	Northbound Morning	Northbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Southbound Morning	Southbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Combined Totals Morning	Combined Totals Afternoon
12:00		1	19			0	36				
12:15		2	25			1	28				
12:30		0	32			0	24				
12:45		3	30	6	106	1	18	2	106	8	212
01:00		0	28			0	30				
01:15		3	26			0	22				
01:30		1	16			3	22				
01:45		1	19	5	89	1	16	4	90	9	179
02:00		0	21			1	23				
02:15		0	25			0	26				
02:30		1	21			0	22				
02:45		0	27	1	94	0	**30**	1	101	2	195
03:00		0	33			0	**43**				
03:15		0	29			0	**39**				
03:30		1	34			0	**31**				
03:45		3	**30**	4	126	1	22	1	135	5	261
04:00		1	**41**			2	30				
04:15		0	**53**			2	35				
04:30		0	**42**			2	30				
04:45		0	25	1	161	2	10	8	105	9	266
05:00		0	38			3	21				
05:15		0	39			8	17				
05:30		0	50			8	25				
05:45		11	31	11	158	8	16	27	79	38	237
06:00		10	30			14	12				
06:15		14	25			25	5				
06:30		15	22			17	7				
06:45		27	22	66	99	18	10	74	34	140	133
07:00		14	11			21	4				
07:15		27	26			**30**	4				
07:30		21	15			**34**	5				
07:45		18	8	80	60	**51**	4	136	17	216	77
08:00		25	16			**44**	3				
08:15		15	6			28	5				
08:30		15	17			18	9				
08:45		15	11	70	50	21	4	111	21	181	71
09:00		**42**	16			52	1				
09:15		**18**	10			19	5				
09:30		**23**	6			27	3				
09:45		**17**	7	100	39	24	2	122	11	222	50
10:00		18	9			18	8				
10:15		15	7			27	3				
10:30		24	5			21	3				
10:45		23	4	80	25	19	2	85	16	165	41
11:00		25	6			19	2				
11:15		25	8			21	4				
11:30		25	3			24	1				
11:45		25	6	100	23	20	0	84	7	184	30
Total		524	1030	524	1030	655	722	655	722	1179	1752
Combined Total		1554		1554		1377		1377		2931	
AM Peak	-	09:00	-	-	-	07:15	-	-	-	-	-
Vol.	-	100	-	-	-	159	-	-	-	-	-
P.H.F.		0.595				0.779					
PM Peak	-	-	03:45	-	-	-	02:45	-	-	-	-
Vol.	-	-	166	-	-	-	143	-	-	-	-
P.H.F.			0.783				0.831				
Percentage		33.7%	66.3%			47.6%	52.4%				

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County of Napa
Deer Park Road
S/ Bremer Winery Driveway / Sanitarium Road
24 Hour Directional Volume Count

CNP001
Site Code: 223-23145

Start Time	1/21/23 Sat	Northbound Morning	Northbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Southbound Morning	Southbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Combined Totals Morning	Combined Totals Afternoon
12:00		1	16			1	15				
12:15		3	24			1	25				
12:30		0	21			0	21				
12:45		1	22	5	83	2	19	4	80	9	163
01:00		2	20			1	18				
01:15		2	31			0	24				
01:30		1	31			0	20				
01:45		1	26	6	108	0	23	1	85	7	193
02:00		0	24			0	26				
02:15		1	30			0	17				
02:30		0	**34**			0	21				
02:45		0	**29**	1	117	0	11	0	75	1	192
03:00		0	**26**			0	14				
03:15		1	**31**			0	28				
03:30		0	22			0	19				
03:45		0	21	1	100	0	18	0	79	1	179
04:00		1	15			0	**21**				
04:15		1	26			1	**29**				
04:30		3	17			4	**23**				
04:45		0	18	5	76	0	**21**	5	94	10	170
05:00		0	25			4	19				
05:15		0	25			2	23				
05:30		1	20			5	12				
05:45		0	16	1	86	3	8	14	62	15	148
06:00		0	21			4	13				
06:15		2	21			7	10				
06:30		0	7			5	6				
06:45		5	19	7	68	7	11	23	40	30	108
07:00		6	20			6	12				
07:15		8	11			7	5				
07:30		15	9			13	4				
07:45		6	12	35	52	11	10	37	31	72	83
08:00		10	13			10	3				
08:15		4	14			17	2				
08:30		13	7			17	2				
08:45		15	7	42	41	11	2	55	9	97	50
09:00		16	8			14	3				
09:15		7	9			**25**	1				
09:30		15	7			**33**	7				
09:45		16	14	54	38	**21**	4	93	15	147	53
10:00		15	4			**30**	0				
10:15		14	7			21	4				
10:30		**18**	5			23	2				
10:45		**23**	12	70	28	18	5	92	11	162	39
11:00		**22**	8			14	3				
11:15		**24**	6			16	0				
11:30		12	7			11	2				
11:45		15	2	73	23	25	1	66	6	139	29
Total		300	820	300	820	390	587	390	587	690	1407
Combined Total		1120		1120		977		977		2097	
AM Peak	-	10:30	-	-	-	09:15	-	-	-	-	-
Vol.	-	87	-	-	-	109	-	-	-	-	-
P.H.F.		0.906				0.826					
PM Peak	-	-	02:30	-	-	-	04:00	-	-	-	-
Vol.	-	-	120	-	-	-	94	-	-	-	-
P.H.F.			0.882				0.810				
Percentage		26.8%	73.2%			39.9%	60.1%				

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County of Napa
Deer Park Road
S/ Bremer Winery Driveway / Sanitarium Road
24 Hour Directional Volume Count

CNP001
Site Code: 223-23145

Start Time	1/22/23 Sun	Northbound Morning	Northbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Southbound Morning	Southbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Combined Totals Morning	Combined Totals Afternoon
12:00		0	23			1	14				
12:15		3	**27**			0	19				
12:30		1	**26**			0	26				
12:45		6	**28**	10	104	0	23	1	82	11	186
01:00		2	**28**			1	17				
01:15		3	21			1	18				
01:30		2	21			0	21				
01:45		0	27	7	97	0	13	2	69	9	166
02:00		2	16			0	11				
02:15		2	20			1	19				
02:30		1	25			1	**19**				
02:45		4	28	9	89	1	**23**	3	72	12	161
03:00		1	23			0	**21**				
03:15		2	26			3	**25**				
03:30		2	14			2	14				
03:45		0	18	5	81	1	18	6	78	11	159
04:00		1	17			1	13				
04:15		0	15			0	12				
04:30		1	25			0	10				
04:45		1	14	3	71	4	14	5	49	8	120
05:00		2	26			0	8				
05:15		0	13			2	11				
05:30		0	14			3	12				
05:45		0	19	2	72	2	9	7	40	9	112
06:00		1	20			1	11				
06:15		3	13			3	5				
06:30		2	15			3	4				
06:45		4	15	10	63	1	5	8	25	18	88
07:00		2	15			2	8				
07:15		5	10			4	9				
07:30		8	9			12	7				
07:45		8	10	23	44	9	2	27	26	50	70
08:00		8	11			9	3				
08:15		7	10			13	3				
08:30		8	5			12	0				
08:45		10	6	33	32	10	2	44	8	77	40
09:00		14	7			13	4				
09:15		10	9			16	1				
09:30		10	6			**22**	1				
09:45		17	5	51	27	**23**	5	74	11	125	38
10:00		13	3			**20**	0				
10:15		17	8			**25**	0				
10:30		8	12			16	2				
10:45		15	3	53	26	14	2	75	4	128	30
11:00		**20**	4			20	0				
11:15		**14**	6			23	3				
11:30		**21**	1			28	2				
11:45		**19**	1	74	12	10	0	81	5	155	17
Total		280	718	280	718	333	469	333	469	613	1187
Combined Total		998		998		802		802		1800	
AM Peak	-	11:00	-	-	-	09:30	-	-	-	-	-
Vol.	-	74	-	-	-	90	-	-	-	-	-
P.H.F.		0.881				0.900					
PM Peak	-	-	00:15	-	-	-	02:30	-	-	-	-
Vol.	-	-	109	-	-	-	88	-	-	-	-
P.H.F.			0.973				0.846				
Percentage		28.1%	71.9%			41.5%	58.5%				

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County of Napa
Deer Park Road
S/ Bremer Winery Driveway / Sanitarium Road
24 Hour Directional Volume Count

CNP001
Site Code: 223-23145

Start Time	1/23/23 Mon	Northbound Morning	Northbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Southbound Morning	Southbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Combined Totals Morning	Combined Totals Afternoon
12:00		4	18			0	28				
12:15		0	23			0	20				
12:30		4	26			0	17				
12:45		0	17	8	84	0	20	0	85	8	169
01:00		1	14			1	21				
01:15		1	13			0	24				
01:30		0	19			1	12				
01:45		1	22	3	68	0	18	2	75	5	143
02:00		1	20			0	23				
02:15		2	17			0	16				
02:30		1	26			0	18				
02:45		1	25	5	88	0	23	0	80	5	168
03:00		0	31			1	**29**				
03:15		1	40			4	**25**				
03:30		0	45			0	**43**				
03:45		1	**41**	2	157	1	**40**	6	137	8	294
04:00		0	**54**			1	27				
04:15		0	**40**			4	23				
04:30		1	**47**			4	15				
04:45		0	36	1	177	5	21	14	86	15	263
05:00		0	44			6	18				
05:15		1	35			6	30				
05:30		7	25			8	18				
05:45		5	44	13	148	10	10	30	76	43	224
06:00		13	30			19	20				
06:15		9	30			19	8				
06:30		**28**	23			27	7				
06:45		**19**	29	69	112	23	5	88	40	157	152
07:00		**23**	17			25	5				
07:15		**35**	11			28	2				
07:30		22	17			**39**	2				
07:45		22	7	102	52	**55**	5	147	14	249	66
08:00		20	14			**41**	3				
08:15		23	10			**34**	2				
08:30		21	8			31	3				
08:45		21	12	85	44	29	3	135	11	220	55
09:00		13	10			29	0				
09:15		20	7			19	3				
09:30		17	7			21	4				
09:45		19	1	69	25	29	3	98	10	167	35
10:00		17	4			16	3				
10:15		23	6			22	2				
10:30		16	6			29	2				
10:45		28	3	84	19	28	2	95	9	179	28
11:00		16	2			16	2				
11:15		13	4			16	0				
11:30		21	2			24	0				
11:45		24	2	74	10	13	1	69	3	143	13
Total		515	984	515	984	684	626	684	626	1199	1610
Combined Total		1499		1499		1310		1310		2809	
AM Peak	-	06:30	-	-	-	07:30	-	-	-	-	-
Vol.	-	105	-	-	-	169	-	-	-	-	-
P.H.F.		0.750				0.768					
PM Peak	-	-	03:45	-	-	-	03:00	-	-	-	-
Vol.	-	-	182	-	-	-	137	-	-	-	-
P.H.F.			0.843				0.797				
Percentage		34.4%	65.6%			52.2%	47.8%				

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County of Napa
Deer Park Road
S/ Bremer Winery Driveway / Sanitarium Road
24 Hour Directional Volume Count

CNP001
Site Code: 223-23145

Start Time	1/24/23 Tue	Northbound Morning	Northbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Southbound Morning	Southbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Combined Totals Morning	Combined Totals Afternoon
12:00		1	27			0	14				
12:15		0	29			1	25				
12:30		2	26			0	21				
12:45		0	14	3	96	0	14	1	74	4	170
01:00		0	17			0	26				
01:15		0	18			0	34				
01:30		0	23			0	16				
01:45		0	34	0	92	0	18	0	94	0	186
02:00		0	19			0	24				
02:15		1	23			1	18				
02:30		0	38			1	26				
02:45		0	21	1	101	1	18	3	86	4	187
03:00		2	36			0	25				
03:15		1	37			0	18				
03:30		1	46			1	28				
03:45		2	31	6	150	2	**38**	3	109	9	259
04:00		0	43			0	**28**				
04:15		2	**37**			2	**30**				
04:30		0	**36**			5	**30**				
04:45		0	**48**	2	164	5	17	12	105	14	269
05:00		2	**48**			4	14				
05:15		0	35			9	22				
05:30		3	38			8	20				
05:45		4	32	9	153	16	11	37	67	46	220
06:00		10	34			12	13				
06:15		14	20			23	9				
06:30		13	11			26	9				
06:45		29	22	66	87	19	7	80	38	146	125
07:00		22	19			33	8				
07:15		18	10			24	7				
07:30		22	20			33	7				
07:45		**32**	13	94	62	**54**	7	144	29	238	91
08:00		**32**	20			**38**	2				
08:15		**24**	9			**39**	5				
08:30		**28**	20			**56**	2				
08:45		18	7	102	56	21	3	154	12	256	68
09:00		15	16			26	4				
09:15		40	12			40	2				
09:30		11	7			28	3				
09:45		19	1	85	36	22	3	116	12	201	48
10:00		27	12			28	3				
10:15		21	6			14	0				
10:30		26	5			32	2				
10:45		23	3	97	26	21	1	95	6	192	32
11:00		27	3			23	0				
11:15		24	3			17	1				
11:30		23	1			21	1				
11:45		25	1	99	8	25	0	86	2	185	10
Total		564	1031	564	1031	731	634	731	634	1295	1665
Combined Total		1595		1595		1365		1365		2960	
AM Peak	-	07:45	-	-	-	07:45	-	-	-	-	-
Vol.	-	116	-	-	-	187	-	-	-	-	-
P.H.F.		0.906				0.835					
PM Peak	-	-	04:15	-	-	-	03:45	-	-	-	-
Vol.	-	-	169	-	-	-	126	-	-	-	-
P.H.F.			0.880				0.829				
Percentage		35.4%	64.6%			53.6%	46.4%				

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County of Napa
Deer Park Road
S/ Bremer Winery Driveway / Sanitarium Road
24 Hour Directional Volume Count

CNP001
Site Code: 223-23145

Start Time	1/25/23 Wed	Northbound Morning	Northbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Southbound Morning	Southbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Combined Totals Morning	Combined Totals Afternoon
12:00		1	22			0	23				
12:15		2	32			1	21				
12:30		1	26			0	22				
12:45		1	16	5	96	0	17	1	83	6	179
01:00		1	25			0	25				
01:15		2	19			0	21				
01:30		1	28			0	22				
01:45		0	29	4	101	0	22	0	90	4	191
02:00		0	33			0	24				
02:15		0	28			0	21				
02:30		0	33			1	21				
02:45		1	16	1	110	0	33	1	99	2	209
03:00		1	42			0	**31**				
03:15		0	33			0	**31**				
03:30		2	**58**			1	**36**				
03:45		0	**57**	3	190	1	**50**	2	148	5	338
04:00		1	**36**			0	24				
04:15		0	**51**			3	29				
04:30		1	49			3	36				
04:45		1	35	3	171	5	20	11	109	14	280
05:00		0	39			9	24				
05:15		4	53			3	21				
05:30		6	41			6	22				
05:45		4	32	14	165	9	15	27	82	41	247
06:00		4	32			14	21				
06:15		18	25			29	16				
06:30		20	21			17	6				
06:45		**27**	19	69	97	24	6	84	49	153	146
07:00		**27**	13			44	9				
07:15		**27**	20			24	9				
07:30		**27**	26			40	10				
07:45		21	12	102	71	**40**	8	148	36	250	107
08:00		27	31			**45**	5				
08:15		18	16			**36**	6				
08:30		11	14			**43**	6				
08:45		27	18	83	79	28	6	152	23	235	102
09:00		33	7			19	4				
09:15		23	17			29	6				
09:30		20	13			32	3				
09:45		18	10	94	47	23	4	103	17	197	64
10:00		19	5			29	0				
10:15		17	9			27	1				
10:30		31	8			17	1				
10:45		28	5	95	27	24	4	97	6	192	33
11:00		24	3			20	4				
11:15		23	2			26	0				
11:30		26	4			30	0				
11:45		10	1	83	10	11	2	87	6	170	16
Total		556	1164	556	1164	713	748	713	748	1269	1912
Combined Total		1720		1720		1461		1461		3181	
AM Peak	-	06:45	-	-	-	07:45	-	-	-	-	-
Vol.	-	108	-	-	-	164	-	-	-	-	-
P.H.F.		1.000				0.911					
PM Peak	-	-	03:30	-	-	-	03:00	-	-	-	-
Vol.	-	-	202	-	-	-	148	-	-	-	-
P.H.F.			0.871				0.740				
Percentage		32.3%	67.7%			48.8%	51.2%				

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County of Napa
Deer Park Road
S/ Bremer Winery Driveway / Sanitarium Road
24 Hour Directional Volume Count

CNP001
Site Code: 223-23145

Start Time	1/26/23 Thu	Northbound Morning	Northbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Southbound Morning	Southbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Combined Totals Morning	Combined Totals Afternoon
12:00		2	25			1	14				
12:15		1	20			1	27				
12:30		0	25			0	13				
12:45		0	20	3	90	1	26	3	80	6	170
01:00		1	25			0	24				
01:15		1	20			1	27				
01:30		0	38			0	28				
01:45		2	27	4	110	1	21	2	100	6	210
02:00		1	13			0	18				
02:15		0	19			0	11				
02:30		1	25			0	24				
02:45		0	23	2	80	0	23	0	76	2	156
03:00		0	36			0	26				
03:15		0	40			1	33				
03:30		1	**56**			0	**39**				
03:45		1	**33**	2	165	1	**24**	2	122	4	287
04:00		2	**46**			1	**34**				
04:15		1	**53**			2	**42**				
04:30		2	37			5	25				
04:45		1	48	6	184	4	22	12	123	18	307
05:00		0	40			6	30				
05:15		1	53			5	21				
05:30		1	41			7	22				
05:45		4	44	6	178	8	23	26	96	32	274
06:00		12	42			18	20				
06:15		12	26			20	10				
06:30		22	32			24	6				
06:45		**26**	29	72	129	21	11	83	47	155	176
07:00		**34**	27			23	16				
07:15		**22**	18			27	7				
07:30		**26**	23			27	10				
07:45		24	15	106	83	**55**	7	132	40	238	123
08:00		20	16			**45**	5				
08:15		20	20			**31**	7				
08:30		22	15			**32**	8				
08:45		23	15	85	66	27	9	135	29	220	95
09:00		25	17			31	5				
09:15		15	15			28	5				
09:30		23	11			28	2				
09:45		25	13	88	56	24	6	111	18	199	74
10:00		24	9			27	4				
10:15		23	6			27	3				
10:30		23	7			21	3				
10:45		34	4	104	26	22	2	97	12	201	38
11:00		24	4			21	4				
11:15		23	5			21	3				
11:30		22	3			17	2				
11:45		18	2	87	14	16	3	75	12	162	26
Total		565	1181	565	1181	678	755	678	755	1243	1936
Combined Total		1746		1746		1433		1433		3179	
AM Peak	-	06:45	-	-	-	07:45	-	-	-	-	-
Vol.	-	108	-	-	-	163	-	-	-	-	-
P.H.F.		0.794				0.741					
PM Peak	-	-	03:30	-	-	-	03:30	-	-	-	-
Vol.	-	-	188	-	-	-	139	-	-	-	-
P.H.F.			0.839				0.827				
Percentage		32.4%	67.6%			47.3%	52.7%				

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County of Napa
Deer Park Road
S/ Bremer Winery Driveway / Sanitarium Road
24 Hour Directional Volume Count

CNP001
Site Code: 223-23145

Start Time	1/27/23 Fri	Northbound Morning	Northbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Southbound Morning	Southbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Combined Totals Morning	Combined Totals Afternoon
12:00		2	36			3	31				
12:15		1	26			1	41				
12:30		1	39			1	30				
12:45		0	29	4	130	0	24	5	126	9	256
01:00		2	28			1	38				
01:15		1	18			2	26				
01:30		0	20			1	19				
01:45		2	25	5	91	0	29	4	112	9	203
02:00		2	34			0	29				
02:15		1	24			0	24				
02:30		1	31			1	38				
02:45		1	35	5	124	1	36	2	127	7	251
03:00		0	29			0	53				
03:15		1	31			0	37				
03:30		0	53			1	41				
03:45		1	49	2	162	0	36	1	167	3	329
04:00		0	40			2	**47**				
04:15		1	**53**			1	**87**				
04:30		1	**66**			1	**64**				
04:45		0	**39**	2	198	3	**48**	7	246	9	444
05:00		0	**58**			6	41				
05:15		1	44			5	53				
05:30		3	31			5	42				
05:45		4	38	8	171	12	40	28	176	36	347
06:00		7	32			13	11				
06:15		24	29			26	10				
06:30		31	18			28	14				
06:45		23	22	85	101	21	13	88	48	173	149
07:00		24	19			26	8				
07:15		26	15			19	6				
07:30		26	16			**41**	6				
07:45		27	15	103	65	**53**	5	139	25	242	90
08:00		24	12			**46**	4				
08:15		20	17			**40**	5				
08:30		**36**	15			36	2				
08:45		**30**	13	110	57	35	3	157	14	267	71
09:00		**26**	17			27	5				
09:15		**31**	12			31	5				
09:30		14	11			31	7				
09:45		16	10	87	50	24	3	113	20	200	70
10:00		26	12			19	6				
10:15		30	9			32	5				
10:30		30	6			32	7				
10:45		34	6	120	33	23	2	106	20	226	53
11:00		21	7			38	3				
11:15		25	3			30	3				
11:30		19	5			30	2				
11:45		33	5	98	20	25	1	123	9	221	29
Total		629	1202	629	1202	773	1090	773	1090	1402	2292
Combined Total		1831		1831		1863		1863		3694	
AM Peak	-	08:30	-	-	-	07:30	-	-	-	-	-
Vol.	-	123	-	-	-	180	-	-	-	-	-
P.H.F.		0.854				0.849					
PM Peak	-	-	04:15	-	-	-	04:00	-	-	-	-
Vol.	-	-	216	-	-	-	246	-	-	-	-
P.H.F.			0.818				0.707				
Percentage		34.4%	65.6%			41.5%	58.5%				

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County of Napa
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24 Hour Directional Volume Count

CNP001
Site Code: 223-23145

Start Time	1/28/23 Sat	Northbound Morning	Northbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Southbound Morning	Southbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Combined Totals Morning	Combined Totals Afternoon
12:00		2	22			2	19				
12:15		2	26			0	42				
12:30		1	34			1	25				
12:45		4	**29**	9	111	1	31	4	117	13	228
01:00		3	**30**			0	**58**				
01:15		1	**28**			1	**30**				
01:30		0	**37**			0	**52**				
01:45		1	27	5	122	1	**50**	2	190	7	312
02:00		2	28			1	31				
02:15		2	18			0	32				
02:30		1	35			0	54				
02:45		0	29	5	110	1	38	2	155	7	265
03:00		1	28			0	23				
03:15		0	28			1	22				
03:30		0	35			0	29				
03:45		1	15	2	106	0	24	1	98	3	204
04:00		1	19			0	17				
04:15		0	19			0	20				
04:30		2	25			2	15				
04:45		1	25	4	88	1	20	3	72	7	160
05:00		0	25			1	20				
05:15		0	25			0	21				
05:30		2	23			5	12				
05:45		2	27	4	100	1	14	7	67	11	167
06:00		0	20			0	15				
06:15		3	26			8	11				
06:30		4	17			6	11				
06:45		4	19	11	82	4	11	18	48	29	130
07:00		7	26			6	7				
07:15		7	18			5	9				
07:30		8	21			10	11				
07:45		20	5	42	70	22	0	43	27	85	97
08:00		9	19			16	8				
08:15		8	11			17	6				
08:30		10	10			8	4				
08:45		14	12	41	52	**21**	4	62	22	103	74
09:00		10	8			**18**	7				
09:15		16	10			**30**	7				
09:30		14	9			**35**	8				
09:45		17	11	57	38	16	1	99	23	156	61
10:00		**24**	9			23	5				
10:15		**17**	6			24	3				
10:30		**22**	8			24	2				
10:45		**26**	5	89	28	19	2	90	12	179	40
11:00		17	7			19	4				
11:15		19	6			23	2				
11:30		18	5			27	1				
11:45		12	3	66	21	20	2	89	9	155	30
Total		335	928	335	928	420	840	420	840	755	1768
Combined Total		1263		1263		1260		1260		2523	
AM Peak	-	10:00	-	-	-	08:45	-	-	-	-	-
Vol.	-	89	-	-	-	104	-	-	-	-	-
P.H.F.		0.856				0.743					
PM Peak	-	-	00:45	-	-	-	01:00	-	-	-	-
Vol.	-	-	124	-	-	-	190	-	-	-	-
P.H.F.			0.838				0.819				
Percentage		26.5%	73.5%			33.3%	66.7%				
ADT/AADT		ADT 2,797		AADT 2,797							

Appendix B

Synchro Intersection LOS Results

Intersection	
Int Delay, s/veh	3.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	132	1	4	2	2	2	2	228	0	1	135	131
Future Vol, veh/h	132	1	4	2	2	2	2	228	0	1	135	131
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	175
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	148	1	4	2	2	2	2	256	0	1	152	147

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	416	414	152	490	561	256	299	0	0	256	0	0
Stage 1	154	154	-	260	260	-	-	-	-	-	-	-
Stage 2	262	260	-	230	301	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.15	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	542	524	886	484	432	775	1245	-	-	1292	-	-
Stage 1	841	764	-	738	687	-	-	-	-	-	-	-
Stage 2	736	687	-	766	660	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	537	522	886	480	431	775	1245	-	-	1292	-	-
Mov Cap-2 Maneuver	537	522	-	480	431	-	-	-	-	-	-	-
Stage 1	839	763	-	737	686	-	-	-	-	-	-	-
Stage 2	730	686	-	760	659	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.2	11.9	0.1	0
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1245	-	-	543	527	1292	-	-
HCM Lane V/C Ratio	0.002	-	-	0.283	0.013	0.001	-	-
HCM Control Delay (s)	7.9	0	-	14.2	11.9	7.8	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	1.2	0	0	-	-

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	85	0	7	2	1	0	1	136	1	0	97	108
Future Vol, veh/h	85	0	7	2	1	0	1	136	1	0	97	108
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	175
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	96	0	8	2	1	0	1	153	1	0	109	121

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	265	265	109	330	386	154	230	0	0	154	0	0
Stage 1	109	109	-	156	156	-	-	-	-	-	-	-
Stage 2	156	156	-	174	230	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.15	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	682	635	937	618	543	884	1320	-	-	1408	-	-
Stage 1	889	799	-	839	763	-	-	-	-	-	-	-
Stage 2	839	763	-	821	708	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	681	634	937	612	542	884	1320	-	-	1408	-	-
Mov Cap-2 Maneuver	681	634	-	612	542	-	-	-	-	-	-	-
Stage 1	888	799	-	838	762	-	-	-	-	-	-	-
Stage 2	837	762	-	814	708	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.1	11.2	0.1	0
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1320	-	-	695	587	1408	-	-
HCM Lane V/C Ratio	0.001	-	-	0.149	0.006	-	-	-
HCM Control Delay (s)	7.7	0	-	11.1	11.2	0	-	-
HCM Lane LOS	A	A	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.5	0	0	-	-

Intersection	
Int Delay, s/veh	3.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	133	1	4	2	2	2	2	230	0	1	139	135
Future Vol, veh/h	133	1	4	2	2	2	2	230	0	1	139	135
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	175
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	149	1	4	2	2	2	2	258	0	1	156	152

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	422	420	156	499	572	258	308	0	0	258	0	0
Stage 1	158	158	-	262	262	-	-	-	-	-	-	-
Stage 2	264	262	-	237	310	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.15	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	537	520	882	477	426	773	1236	-	-	1289	-	-
Stage 1	837	761	-	736	686	-	-	-	-	-	-	-
Stage 2	735	686	-	760	654	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	532	518	882	473	425	773	1236	-	-	1289	-	-
Mov Cap-2 Maneuver	532	518	-	473	425	-	-	-	-	-	-	-
Stage 1	835	760	-	735	685	-	-	-	-	-	-	-
Stage 2	729	685	-	754	653	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.4	12	0.1	0
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1236	-	-	538	521	1289	-	-
HCM Lane V/C Ratio	0.002	-	-	0.288	0.013	0.001	-	-
HCM Control Delay (s)	7.9	0	-	14.4	12	7.8	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	1.2	0	0	-	-

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	87	0	7	2	1	0	1	140	1	0	100	112
Future Vol, veh/h	87	0	7	2	1	0	1	140	1	0	100	112
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	175
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	98	0	8	2	1	0	1	157	1	0	112	126

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	272	272	112	339	398	158	238	0	0	158	0	0
Stage 1	112	112	-	160	160	-	-	-	-	-	-	-
Stage 2	160	160	-	179	238	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.15	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	674	630	933	609	535	880	1311	-	-	1403	-	-
Stage 1	886	797	-	835	760	-	-	-	-	-	-	-
Stage 2	835	760	-	816	703	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	673	629	933	604	534	880	1311	-	-	1403	-	-
Mov Cap-2 Maneuver	673	629	-	604	534	-	-	-	-	-	-	-
Stage 1	885	797	-	834	759	-	-	-	-	-	-	-
Stage 2	833	759	-	809	703	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.2	11.3	0.1	0
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1311	-	-	687	579	1403	-	-
HCM Lane V/C Ratio	0.001	-	-	0.154	0.006	-	-	-
HCM Control Delay (s)	7.7	0	-	11.2	11.3	0	-	-
HCM Lane LOS	A	A	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.5	0	0	-	-

Intersection	
Int Delay, s/veh	3.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		⇕			⇕			⇕			⇕	↱
Traffic Vol, veh/h	156	1	5	2	2	2	2	269	0	1	159	154
Future Vol, veh/h	156	1	5	2	2	2	2	269	0	1	159	154
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	175
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	175	1	6	2	2	2	2	302	0	1	179	173

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	489	487	179	577	660	302	352	0	0	302	0	0
Stage 1	181	181	-	306	306	-	-	-	-	-	-	-
Stage 2	308	306	-	271	354	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.15	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	484	476	856	423	379	731	1190	-	-	1242	-	-
Stage 1	814	744	-	697	656	-	-	-	-	-	-	-
Stage 2	696	656	-	728	625	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	479	475	856	418	378	731	1190	-	-	1242	-	-
Mov Cap-2 Maneuver	479	475	-	418	378	-	-	-	-	-	-	-
Stage 1	812	743	-	696	655	-	-	-	-	-	-	-
Stage 2	690	655	-	721	624	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.8	12.8	0.1	0
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1190	-	-	486	468	1242	-	-
HCM Lane V/C Ratio	0.002	-	-	0.375	0.014	0.001	-	-
HCM Control Delay (s)	8	0	-	16.8	12.8	7.9	0	-
HCM Lane LOS	A	A	-	C	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	1.7	0	0	-	-

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↰	↱
Traffic Vol, veh/h	100	0	8	2	1	0	1	160	1	0	114	127
Future Vol, veh/h	100	0	8	2	1	0	1	160	1	0	114	127
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	175
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	112	0	9	2	1	0	1	180	1	0	128	143

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	311	311	128	387	454	181	271	0	0	181	0	0
Stage 1	128	128	-	183	183	-	-	-	-	-	-	-
Stage 2	183	183	-	204	271	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.15	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	636	599	914	566	497	854	1275	-	-	1376	-	-
Stage 1	869	784	-	812	743	-	-	-	-	-	-	-
Stage 2	812	743	-	791	680	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	635	598	914	560	497	854	1275	-	-	1376	-	-
Mov Cap-2 Maneuver	635	598	-	560	497	-	-	-	-	-	-	-
Stage 1	868	784	-	811	742	-	-	-	-	-	-	-
Stage 2	810	742	-	783	680	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.8	11.7	0	0
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1275	-	-	650	537	1376	-	-
HCM Lane V/C Ratio	0.001	-	-	0.187	0.006	-	-	-
HCM Control Delay (s)	7.8	0	-	11.8	11.7	0	-	-
HCM Lane LOS	A	A	-	B	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.7	0	0	-	-

Intersection	
Int Delay, s/veh	3.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↰	↱
Traffic Vol, veh/h	132	1	4	0	0	0	4	230	1	1	135	131
Future Vol, veh/h	132	1	4	0	0	0	4	230	1	1	135	131
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	175
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	148	1	4	0	0	0	4	258	1	1	152	147

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	421	421	152	497	568	259	299	0	0	259	0	0
Stage 1	154	154	-	267	267	-	-	-	-	-	-	-
Stage 2	267	267	-	230	301	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.15	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	538	519	886	479	428	772	1245	-	-	1288	-	-
Stage 1	841	764	-	732	683	-	-	-	-	-	-	-
Stage 2	732	683	-	766	660	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	536	516	886	474	426	772	1245	-	-	1288	-	-
Mov Cap-2 Maneuver	536	516	-	474	426	-	-	-	-	-	-	-
Stage 1	838	763	-	729	680	-	-	-	-	-	-	-
Stage 2	729	680	-	760	659	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.3	0	0.1	0
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1245	-	-	542	-	1288	-	-
HCM Lane V/C Ratio	0.004	-	-	0.284	-	0.001	-	-
HCM Control Delay (s)	7.9	0	-	14.3	0	7.8	0	-
HCM Lane LOS	A	A	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	1.2	-	0	-	-

Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	6	4	231	0	0	139
Future Vol, veh/h	6	4	231	0	0	139
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	4	251	0	0	151

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	402	251	0	0	251	0
Stage 1	251	-	-	-	-	-
Stage 2	151	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	604	788	-	-	1314	-
Stage 1	791	-	-	-	-	-
Stage 2	877	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	604	788	-	-	1314	-
Mov Cap-2 Maneuver	604	-	-	-	-	-
Stage 1	791	-	-	-	-	-
Stage 2	877	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.5	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	666	1314	-
HCM Lane V/C Ratio	-	-	0.016	-	-
HCM Control Delay (s)	-	-	10.5	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	85	1	7	0	0	0	2	136	2	0	97	108
Future Vol, veh/h	85	1	7	0	0	0	2	136	2	0	97	108
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	175
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	96	1	8	0	0	0	2	153	2	0	109	121

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	267	268	109	332	388	154	230	0	0	155	0	0
Stage 1	109	109	-	158	158	-	-	-	-	-	-	-
Stage 2	158	159	-	174	230	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.15	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	680	633	937	616	542	884	1320	-	-	1407	-	-
Stage 1	889	799	-	837	761	-	-	-	-	-	-	-
Stage 2	837	761	-	821	708	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	679	632	937	609	541	884	1320	-	-	1407	-	-
Mov Cap-2 Maneuver	679	632	-	609	541	-	-	-	-	-	-	-
Stage 1	887	799	-	835	759	-	-	-	-	-	-	-
Stage 2	835	759	-	813	708	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.1	0	0.1	0
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1320	-	-	693	-	1407	-	-
HCM Lane V/C Ratio	0.002	-	-	0.151	-	-	-	-
HCM Control Delay (s)	7.7	0	-	11.1	0	0	-	-
HCM Lane LOS	A	A	-	B	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.5	-	0	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	3	1	139	0	0	104
Future Vol, veh/h	3	1	139	0	0	104
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	1	151	0	0	113

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	264	151	0	0	151	0
Stage 1	151	-	-	-	-	-
Stage 2	113	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	725	895	-	-	1430	-
Stage 1	877	-	-	-	-	-
Stage 2	912	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	725	895	-	-	1430	-
Mov Cap-2 Maneuver	725	-	-	-	-	-
Stage 1	877	-	-	-	-	-
Stage 2	912	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.8	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	761	1430	-
HCM Lane V/C Ratio	-	-	0.006	-	-
HCM Control Delay (s)	-	-	9.8	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	3.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	133	1	4	0	0	0	4	232	1	1	139	135
Future Vol, veh/h	133	1	4	0	0	0	4	232	1	1	139	135
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	175
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	149	1	4	0	0	0	4	261	1	1	156	152

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	428	428	156	507	580	262	308	0	0	262	0	0
Stage 1	158	158	-	270	270	-	-	-	-	-	-	-
Stage 2	270	270	-	237	310	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.15	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	532	515	882	471	422	769	1236	-	-	1285	-	-
Stage 1	837	761	-	729	680	-	-	-	-	-	-	-
Stage 2	729	680	-	760	654	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	530	512	882	466	420	769	1236	-	-	1285	-	-
Mov Cap-2 Maneuver	530	512	-	466	420	-	-	-	-	-	-	-
Stage 1	834	760	-	726	677	-	-	-	-	-	-	-
Stage 2	726	677	-	754	653	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.4	0	0.1	0
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1236	-	-	536	-	1285	-	-
HCM Lane V/C Ratio	0.004	-	-	0.289	-	0.001	-	-
HCM Control Delay (s)	7.9	0	-	14.4	0	7.8	0	-
HCM Lane LOS	A	A	-	B	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	1.2	-	0	-	-

Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	6	4	233	0	0	143
Future Vol, veh/h	6	4	233	0	0	143
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	4	253	0	0	155

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	408	253	0	0	253	0
Stage 1	253	-	-	-	-	-
Stage 2	155	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	599	786	-	-	1312	-
Stage 1	789	-	-	-	-	-
Stage 2	873	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	599	786	-	-	1312	-
Mov Cap-2 Maneuver	599	-	-	-	-	-
Stage 1	789	-	-	-	-	-
Stage 2	873	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.5	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	662	1312	-
HCM Lane V/C Ratio	-	-	0.016	-	-
HCM Control Delay (s)	-	-	10.5	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	89	1	7	0	0	0	2	144	2	0	103	115
Future Vol, veh/h	89	1	7	0	0	0	2	144	2	0	103	115
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	175
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	100	1	8	0	0	0	2	162	2	0	116	129

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	283	284	116	352	412	163	245	0	0	164	0	0
Stage 1	116	116	-	167	167	-	-	-	-	-	-	-
Stage 2	167	168	-	185	245	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.15	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	663	620	928	597	525	874	1304	-	-	1396	-	-
Stage 1	881	794	-	828	755	-	-	-	-	-	-	-
Stage 2	828	754	-	810	698	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	662	619	928	590	524	874	1304	-	-	1396	-	-
Mov Cap-2 Maneuver	662	619	-	590	524	-	-	-	-	-	-	-
Stage 1	879	794	-	826	753	-	-	-	-	-	-	-
Stage 2	826	752	-	802	698	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.4	0	0.1	0
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1304	-	-	675	-	1396	-	-
HCM Lane V/C Ratio	0.002	-	-	0.161	-	-	-	-
HCM Control Delay (s)	7.8	0	-	11.4	0	0	-	-
HCM Lane LOS	A	A	-	B	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.6	-	0	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	3	1	147	0	0	110
Future Vol, veh/h	3	1	147	0	0	110
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	1	160	0	0	120

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	280	160	0	0	160	0
Stage 1	160	-	-	-	-	-
Stage 2	120	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	710	885	-	-	1419	-
Stage 1	869	-	-	-	-	-
Stage 2	905	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	710	885	-	-	1419	-
Mov Cap-2 Maneuver	710	-	-	-	-	-
Stage 1	869	-	-	-	-	-
Stage 2	905	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.8	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	747	1419	-
HCM Lane V/C Ratio	-	-	0.006	-	-
HCM Control Delay (s)	-	-	9.8	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	3.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	↱
Traffic Vol, veh/h	156	1	5	0	0	0	4	271	1	1	159	154
Future Vol, veh/h	156	1	5	0	0	0	4	271	1	1	159	154
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	175
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	175	1	6	0	0	0	4	304	1	1	179	173

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	494	494	179	584	667	305	352	0	0	305	0	0
Stage 1	181	181	-	313	313	-	-	-	-	-	-	-
Stage 2	313	313	-	271	354	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.15	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	481	472	856	419	376	728	1190	-	-	1239	-	-
Stage 1	814	744	-	691	652	-	-	-	-	-	-	-
Stage 2	691	652	-	728	625	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	479	470	856	414	374	728	1190	-	-	1239	-	-
Mov Cap-2 Maneuver	479	470	-	414	374	-	-	-	-	-	-	-
Stage 1	811	743	-	688	649	-	-	-	-	-	-	-
Stage 2	688	649	-	721	624	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	16.8	0	0.1	0
HCM LOS	C	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1190	-	-	486	-	1239	-	-
HCM Lane V/C Ratio	0.004	-	-	0.375	-	0.001	-	-
HCM Control Delay (s)	8	0	-	16.8	0	7.9	0	-
HCM Lane LOS	A	A	-	C	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	1.7	-	0	-	-

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	6	4	272	0	0	164
Future Vol, veh/h	6	4	272	0	0	164
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	4	296	0	0	178

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	474	296	0	0	296	0
Stage 1	296	-	-	-	-	-
Stage 2	178	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	549	743	-	-	1265	-
Stage 1	755	-	-	-	-	-
Stage 2	853	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	549	743	-	-	1265	-
Mov Cap-2 Maneuver	549	-	-	-	-	-
Stage 1	755	-	-	-	-	-
Stage 2	853	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	613	1265	-
HCM Lane V/C Ratio	-	-	0.018	-	-
HCM Control Delay (s)	-	-	11	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↰	↱
Traffic Vol, veh/h	100	1	8	0	0	0	2	160	2	0	114	127
Future Vol, veh/h	100	1	8	0	0	0	2	160	2	0	114	127
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	175
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	5	5	5	5	5	5	5	5	5	5	5	5
Mvmt Flow	112	1	9	0	0	0	2	180	2	0	128	143

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	313	314	128	390	456	181	271	0	0	182	0	0
Stage 1	128	128	-	185	185	-	-	-	-	-	-	-
Stage 2	185	186	-	205	271	-	-	-	-	-	-	-
Critical Hdwy	7.15	6.55	6.25	7.15	6.55	6.25	4.15	-	-	4.15	-	-
Critical Hdwy Stg 1	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.15	5.55	-	6.15	5.55	-	-	-	-	-	-	-
Follow-up Hdwy	3.545	4.045	3.345	3.545	4.045	3.345	2.245	-	-	2.245	-	-
Pot Cap-1 Maneuver	634	597	914	564	496	854	1275	-	-	1375	-	-
Stage 1	869	784	-	810	741	-	-	-	-	-	-	-
Stage 2	810	740	-	790	680	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	633	596	914	557	495	854	1275	-	-	1375	-	-
Mov Cap-2 Maneuver	633	596	-	557	495	-	-	-	-	-	-	-
Stage 1	867	784	-	808	740	-	-	-	-	-	-	-
Stage 2	808	739	-	781	680	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.9	0	0.1	0
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1275	-	-	647	-	1375	-	-
HCM Lane V/C Ratio	0.002	-	-	0.189	-	-	-	-
HCM Control Delay (s)	7.8	0	-	11.9	0	0	-	-
HCM Lane LOS	A	A	-	B	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.7	-	0	-	-

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	3	1	163	0	0	122
Future Vol, veh/h	3	1	163	0	0	122
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	1	177	0	0	133

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	310	177	0	0	177	0
Stage 1	177	-	-	-	-	-
Stage 2	133	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	682	866	-	-	1399	-
Stage 1	854	-	-	-	-	-
Stage 2	893	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	682	866	-	-	1399	-
Mov Cap-2 Maneuver	682	-	-	-	-	-
Stage 1	854	-	-	-	-	-
Stage 2	893	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10	0	0
HCM LOS	B		

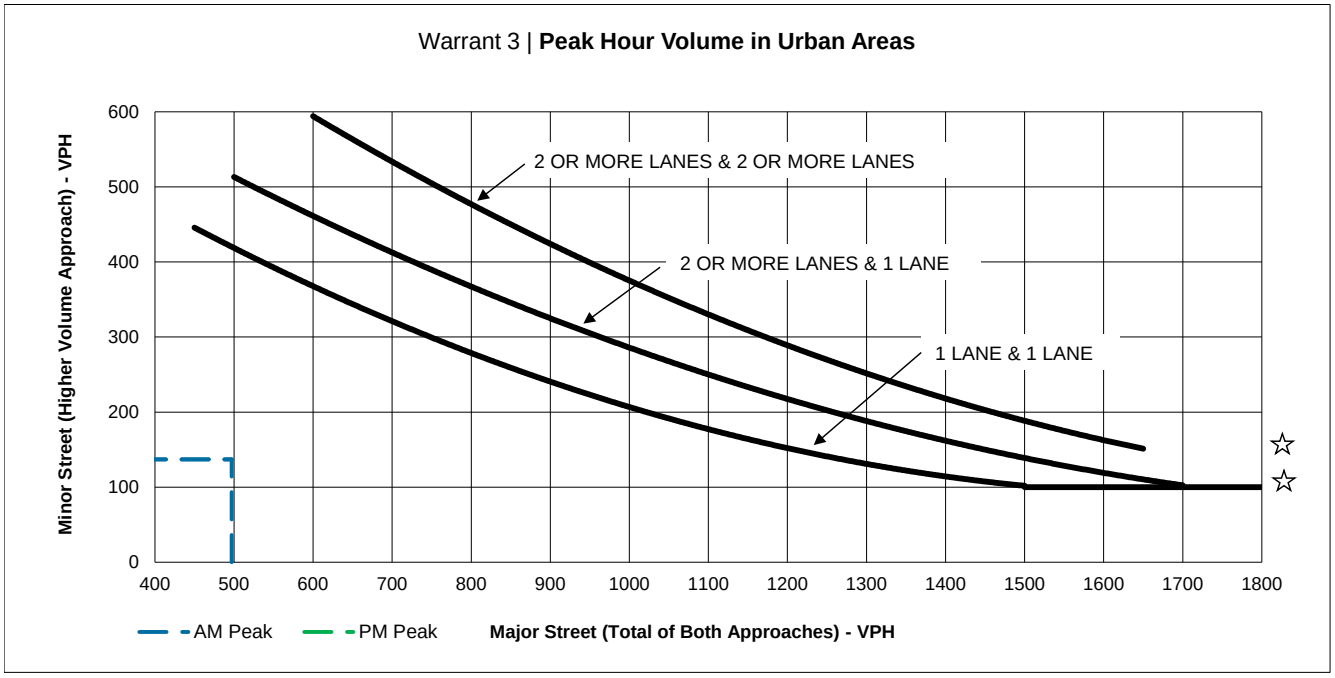
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	720	1399	-
HCM Lane V/C Ratio	-	-	0.006	-	-
HCM Control Delay (s)	-	-	10	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0	0	-

Appendix C

Signal Warrant Sheets

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

** Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation*



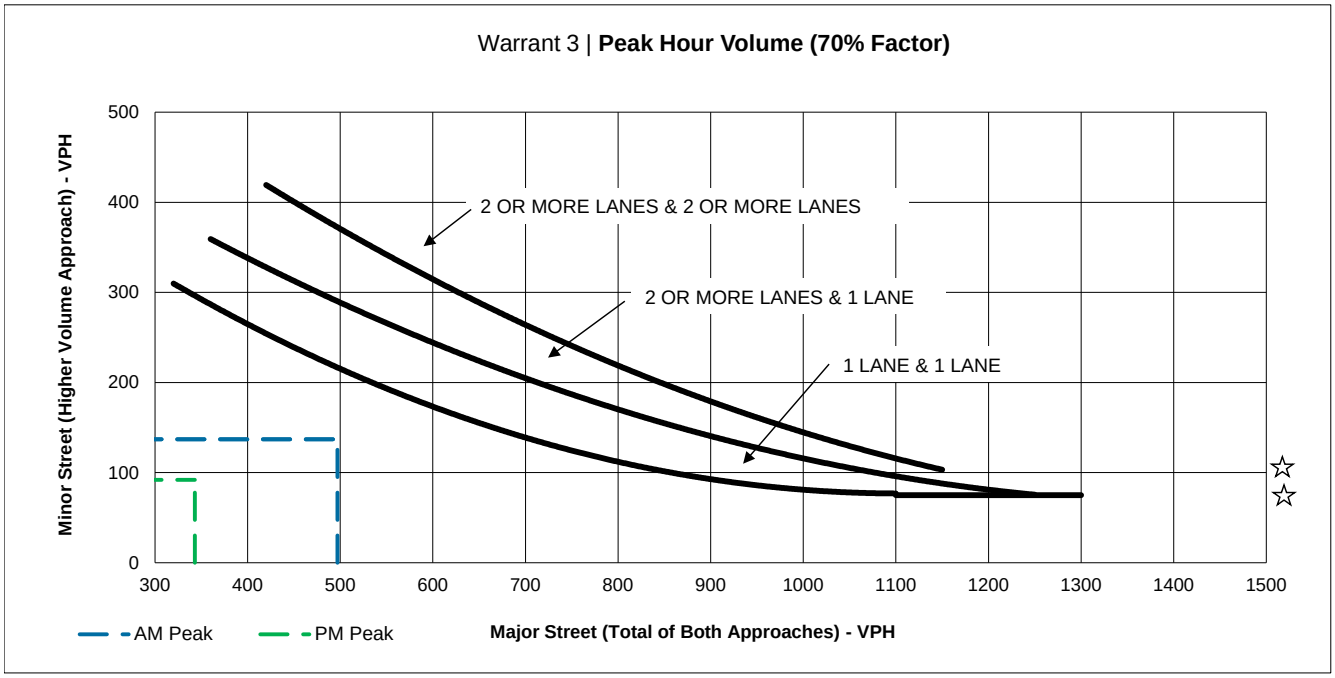
☆ **NOTE:**
150 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR MINOR STREET APPROACH WITH TWO OR MORE LANES AND 100 VPH APPLIES AS THE LOWER THRESHOLD VOLUME FOR A MINOR STREET APPROACHING WITH ONE LANE.

SCENARIO (AM/PM)	Existing (NP)	
		Number of Lanes
Major Approach	Deer Park Road	1
Minor Approach	Sanitarium Road	1
	PM Peak	MD Peak
Major St. Volume (both approaches):	497	343
Minor St. Volume (higher volume approach):	137	92
Warrant Met?:		

Volumes for higher minor street

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
400	265	400	340	400	N/A
500	210	500	290	500	375
600	180	600	240	600	310
700	150	700	200	700	260
800	90	800	175	800	220
900	100	900	140	900	180
1000	85	1000	120	1000	150
1100	75	1100	95	1150	100
1200	75	1200	80	1200	100
1300	75	1250	75	1300	100

** Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation*



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SCENARIO (AM/PM)	Existing (NP)	
		Number of Lanes
Major Approach	Deer Park Road	1
Minor Approach	Sanitarium Rod	1
	AM Peak	PM Peak
Major St. Volume (both approaches):	497	343
Minor St. Volume (higher volume approach):	137	92
Warrant Met?:		

Volumes for higher minor street

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
700	325	700	420	700	540
800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

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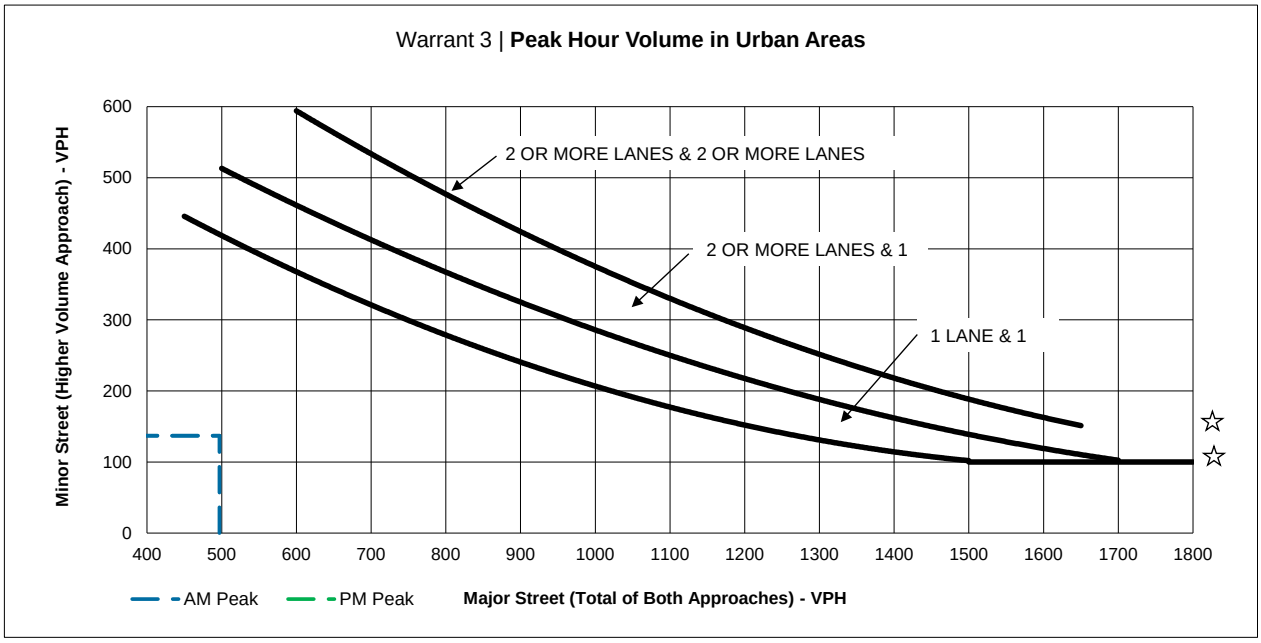

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SCENARIO (AM/PM)	Cumulative (NP)	
		Number of Lanes
Major Approach	Deer Park Road	1
Minor Approach	Sanitarium Road	1
	PM Peak	MD Peak
Major St. Volume (both approaches):	585	364
Minor St. Volume (higher volume approach):	162	109
Warrant Met?:		

Volumes for higher minor street

AM Peak	X	Y
Series 1	0	162
	585	162
Series 2	585	0
	585	162

PM Peak	X	Y
Series 1	0	109
	364	109
Series 2	364	0
	364	109

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
400	265	400	340	400	N/A
500	210	500	290	500	375
600	180	600	240	600	310
700	150	700	200	700	260
800	90	800	175	800	220
900	100	900	140	900	180
1000	85	1000	120	1000	150
1100	75	1100	95	1150	100
1200	75	1200	80	1200	100
1300	75	1250	75	1300	100

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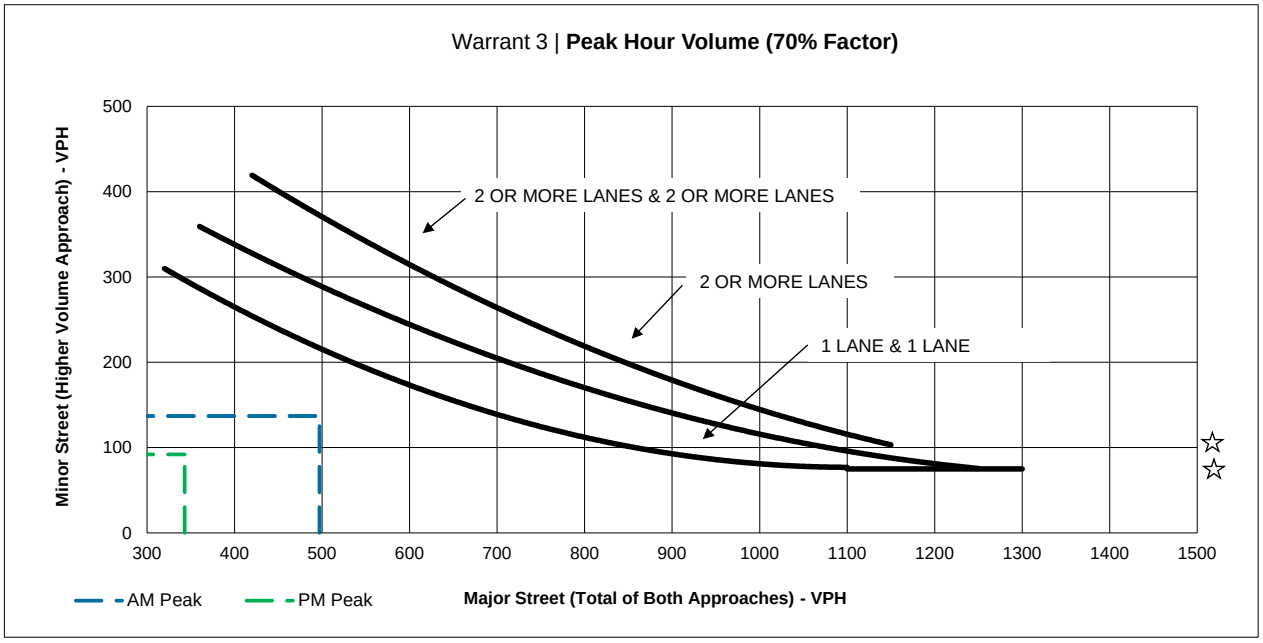

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SCENARIO (AM/PM)	Cumulative (NP)	
		Number of Lanes
Major Approach	Deer Park Road	1
Minor Approach	Sanitarium Rod	1
	AM Peak	PM Peak
Major St. Volume (both approaches):	585	364
Minor St. Volume (higher volume approach):	162	109
Warrant Met?:		

Volumes for higher minor street

AM Peak	X	Y
Series 1	0	162
	585	162
Series 2	585	0
	585	162

PM Peak	X	Y
Series 1	0	109
	364	109
Series 2	364	0
	364	109

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
500	420	500	505	500	N/A
600	360	600	460	600	590
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800	285	800	360	800	475
900	245	900	325	900	425
1000	200	1000	285	1000	370
1100	175	1100	250	1100	340
1200	150	1200	220	1200	285
1300	130	1300	190	1300	250
1400	120	1400	155	1400	220
1500	100	1500	145	1500	180
1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

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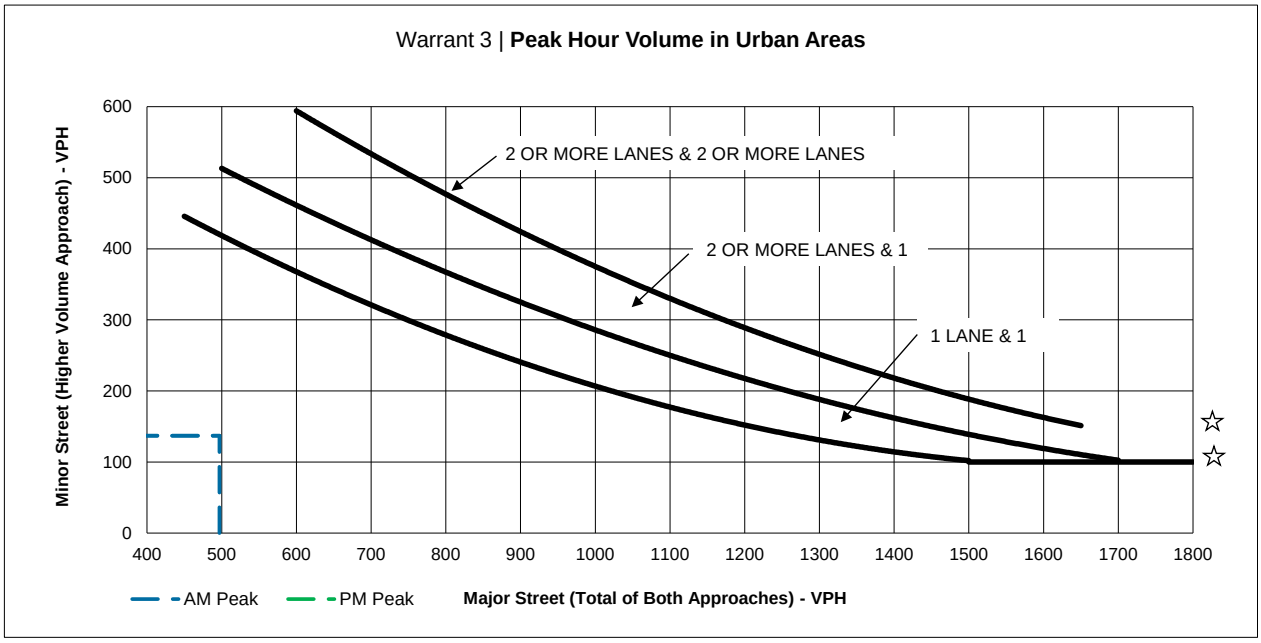

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SCENARIO (AM/PM)	**Exist + Project**	
		Number of Lanes
Major Approach	Deer Park Road	1
Minor Approach	Sanitarium Road	1
	PM Peak	MD Peak
Major St. Volume (both approaches):	502	345
Minor St. Volume (higher volume approach):	137	93
Warrant Met?:		

Volumes for higher minor street

AM Peak	X	Y
Series 1	0	137
	502	137
Series 2	502	0
	502	137

PM Peak	X	Y
Series 1	0	93
	345	93
Series 2	345	0
	345	93

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
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900	100	900	140	900	180
1000	85	1000	120	1000	150
1100	75	1100	95	1150	100
1200	75	1200	80	1200	100
1300	75	1250	75	1300	100

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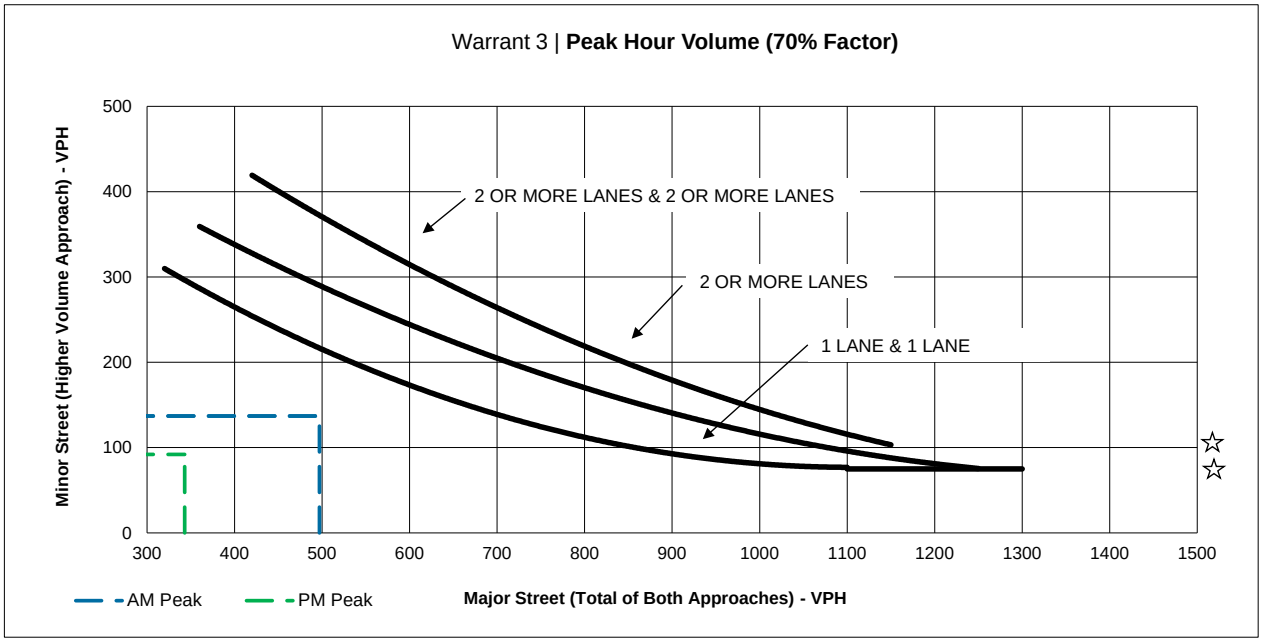

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SCENARIO (AM/PM)	Exist + Project		
		Number of Lanes	
Major Approach	Deer Park Road	1	
Minor Approach	Sanitarium Rod	1	
	AM Peak	PM Peak	**Volumes for higher minor street**
Major St. Volume (both approaches):	502	345	
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Warrant Met?:			

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Series 2	502	0
	502	137

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Series 1	0	93
	345	93
Series 2	345	0
	345	93

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
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1400	120	1400	155	1400	220
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1600	100	1600	120	1600	170
1700	100	1700	100	1650	150
1800	100	1800	100	1800	150

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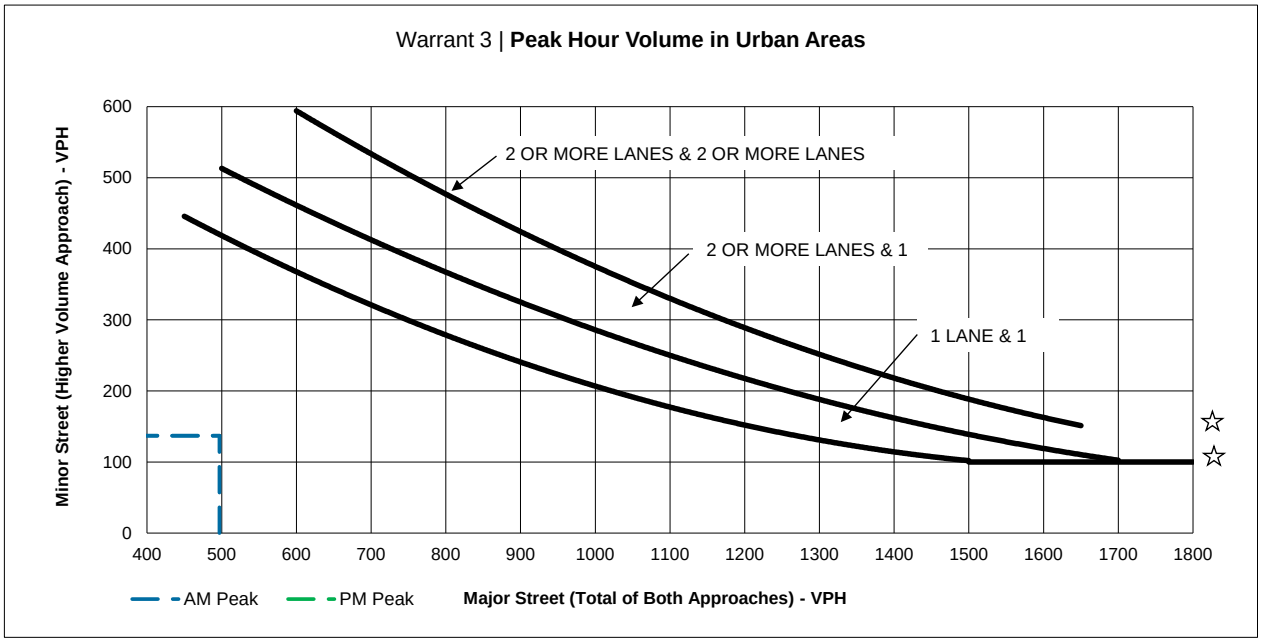

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SCENARIO (AM/PM)	**Cumulative + Project**	
		Number of Lanes
Major Approach	Deer Park Road	1
Minor Approach	Sanitarium Road	1
	PM Peak	MD Peak
Major St. Volume (both approaches):	590	405
Minor St. Volume (higher volume approach):	162	109
Warrant Met?:		

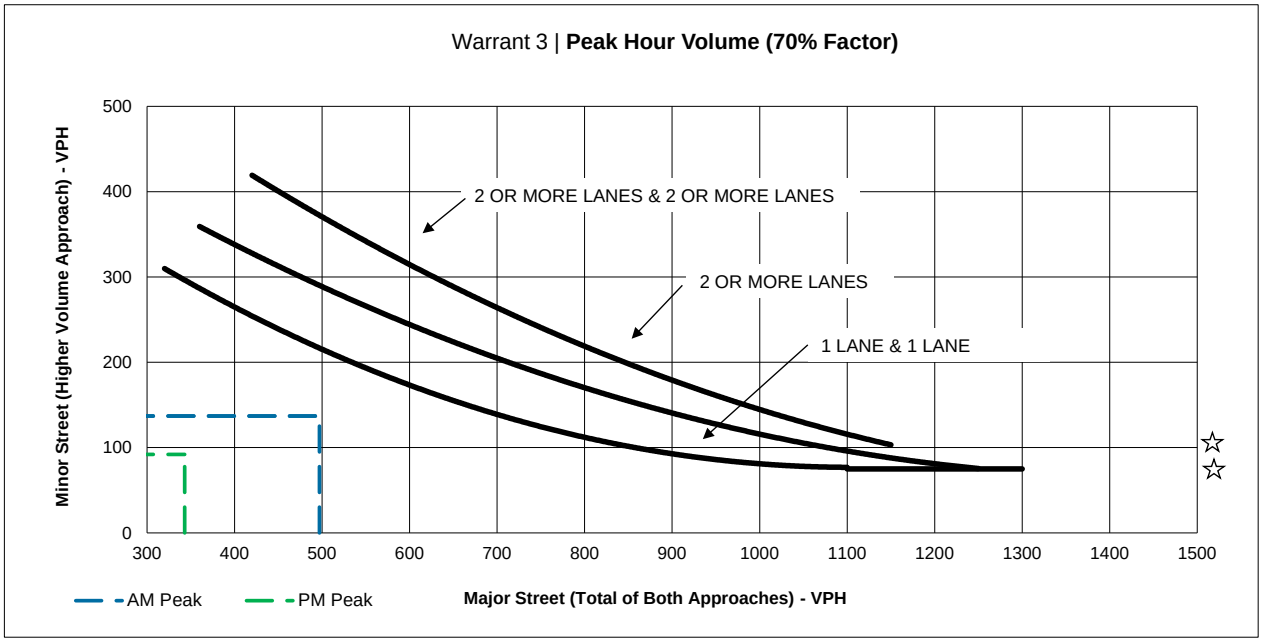
Volumes for higher minor street

AM Peak	X	Y
Series 1	0	162
	590	162
Series 2	590	0
	590	162

PM Peak	X	Y
Series 1	0	109
	405	109
Series 2	405	0
	405	109

Both 1 Lane Approaches		2 or more Lane and One Lane Approaches		Both 2 or more Lane Approaches	
Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach	Major Street Total of Both Approaches	Minor Street High Volume Approach
400	265	400	340	400	N/A
500	210	500	290	500	375
600	180	600	240	600	310
700	150	700	200	700	260
800	90	800	175	800	220
900	100	900	140	900	180
1000	85	1000	120	1000	150
1100	75	1100	95	1150	100
1200	75	1200	80	1200	100
1300	75	1250	75	1300	100

** Note: Values in Table are approximate, actual curves based upon 2nd order polynomial equation*



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SCENARIO (AM/PM)	Exist + Project		
		Number of Lanes	
Major Approach	Deer Park Road	1	
Minor Approach	Sanitarium Rod	1	
	AM Peak	PM Peak	**Volumes for higher minor street**
Major St. Volume (both approaches):	590	405	
Minor St. Volume (higher volume approach):	162	109	
Warrant Met?:			

AM Peak	X	Y
Series 1	0	162
	590	162
Series 2	590	0
	590	162

PM Peak	X	Y
Series 1	0	109
	405	109
Series 2	405	0
	405	109

Appendix D

Approved Project Trip Generation

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: ALOFT WINERY (P16-00429) **Date Prepared:** 2/6/23

Existing Entitled Winery		Harvest	Non-Harvest
Number of Full Time Employees*	Weekday	0	
	Weekend	0	
Number of Part Time Employees*	Weekday	0	
	Weekend	0	
Maximum Daily Visitation	Weekday	0	
	Weekend	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	
	Weekend	0	

Proposed Winery		Harvest	Non-Harvest
Number of Full Time Employees*	Weekday	6	
	Weekend	6	
Number of Part Time Employees*	Weekday	2	
	Weekend	2	
Maximum Daily Visitation	Weekday	20	
	Weekend	20	
Annual Gallons of Production		50,000	50,000
Annual Tons of Grape Haul		312.5	N/A
Number of Visitors at the Largest Event that occurs two or more times per month, on average	Weekday	125	
	Weekend	125	

*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).

ALOFT WINERY (P16-00429)
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	6	0	3.05 one way trips/employee	FT Employee Daily Trips	18.3	0.0
PT Employees	2	0	1.9 one way trips/employee	PT Employee Daily Trips	3.8	0.0
Max Visitors	20	0	2.6 visitors/vehicle for 2 one way trips	Max Visitor Daily Trips	15.4	0.0
Max Event	125	0	2.6 visitors/vehicle for 2 one way trips	Max Event Daily Trips	96.2	0.0
Gallons of Production	50,000		0.000018 truck trips	Production Daily Trips	0.9	0.9
Tons of Grape Haul#	312.5		0.013889 truck trips	Grape Haul Daily Trips	4.3	0.0
				Total Weekday Daily Trips	139	1
				Total Weekday Peak Hour Trips*	15	1
Maximum Daily Weekend Traffic (Saturday)						
	Harvest	*Non-Harvest*				
FT Employees	6	0	3.05 one way trips/employee	FT Employee Daily Trips	18.3	0.0
PT Employees	2	0	1.9 one way trips/employee	PT Employee Daily Trips	3.8	0.0
Max Visitors	20	0	2.8 visitors/vehicle for 2 one way trips	Max Visitor Daily Trips	14.3	0.0
Max Event	125	0	2.8 visitors/vehicle for 2 one way trips	Max Event Daily Trips	89.3	0.0
Gallons of Production	50,000		0.000018 truck trips	Production Daily Trips	0.9	0.9
Tons of Grape Haul#	312.5		0.013889 truck trips	Grape Haul Daily Trips	4.3	0.0
				Total Weekend Daily Trips	131	1
				Total Weekend Peak Hour Trips*	19	1
Maximum Annual Traffic						
				Total Annual Trips**	10,815	

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**	139	1
	Net New Weekday Peak Hour Trips*	15	1
Maximum Weekend Traffic (Saturday)			
If total net new daily trips is greater than 40, a TIS is required	**Net New Weekend Daily Trips**	131	1
	Net New Weekend Peak Hour Trips*	19	1
Maximum Annual Traffic			
Please Prepare a Traffic Impact Study	**Net New Annual Trips****	10,815	

#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.

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: RED LAKE WINERY (P18-00267) **Date Prepared:** 2/6/23

Existing Entitled Winery		Harvest	Non-Harvest
Number of Full Time Employees*	Weekday	0	
	Weekend	0	
Number of Part Time Employees*	Weekday	0	
	Weekend	0	
Maximum Daily Visitation	Weekday	0	
	Weekend	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	
	Weekend	0	

Proposed Winery		Harvest	Non-Harvest
Number of Full Time Employees*	Weekday	4	
	Weekend	4	
Number of Part Time Employees*	Weekday	1	
	Weekend	1	
Maximum Daily Visitation	Weekday	12	
	Weekend	12	
Annual Gallons of Production		30,000	30,000
Annual Tons of Grape Haul		187.5	N/A
Number of Visitors at the Largest Event that occurs two or more times per month, on average	Weekday	75	
	Weekend	75	

*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).

RED LAKE WINERY (P18-00267)
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	4	0	3.05 one way trips/employee	FT Employee Daily Trips	12.2	0.0
PT Employees	1	0	1.9 one way trips/employee	PT Employee Daily Trips	1.9	0.0
Max Visitors	12	0	2.6 visitors/vehicle for 2 one way trips	Max Visitor Daily Trips	9.2	0.0
Max Event	75	0	2.6 visitors/vehicle for 2 one way trips	Max Event Daily Trips	57.7	0.0
Gallons of Production	30,000		0.000018 truck trips	Production Daily Trips	0.5	0.5
Tons of Grape Haul#	187.5		0.013889 truck trips	Grape Haul Daily Trips	2.6	0.0
				Total Weekday Daily Trips	85	1
				Total Weekday Peak Hour Trips*	10	1
Maximum Daily Weekend Traffic (Saturday)						
	Harvest	*Non-Harvest*				
FT Employees	4	0	3.05 one way trips/employee	FT Employee Daily Trips	12.2	0.0
PT Employees	1	0	1.9 one way trips/employee	PT Employee Daily Trips	1.9	0.0
Max Visitors	12	0	2.8 visitors/vehicle for 2 one way trips	Max Visitor Daily Trips	8.6	0.0
Max Event	75	0	2.8 visitors/vehicle for 2 one way trips	Max Event Daily Trips	53.6	0.0
Gallons of Production	30,000		0.000018 truck trips	Production Daily Trips	0.5	0.5
Tons of Grape Haul#	187.5		0.013889 truck trips	Grape Haul Daily Trips	2.6	0.0
				Total Weekend Daily Trips	80	1
				Total Weekend Peak Hour Trips*	12	1
Maximum Annual Traffic						
				Total Annual Trips**	6,723	

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**	85	1
	Net New Weekday Peak Hour Trips*	10	1
Maximum Weekend Traffic (Saturday)			
If total net new daily trips is greater than 40, a TIS is required	**Net New Weekend Daily Trips**	80	1
	Net New Weekend Peak Hour Trips*	12	1
Maximum Annual Traffic			
Please Prepare a Traffic Impact Study	**Net New Annual Trips****	6,723	

#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 E

Bremer Family Winery Trip Generation

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: BREMER FAMILY WINERY USE MODIFICATION (GHD Prepared) **Date Prepared:** 2/14/23

Existing Entitled Winery		Harvest	Non-Harvest
Number of Full Time Employees*	Weekday	4	4
	Weekend	2	2
Number of Part Time Employees*	Weekday	2	0
	Weekend	2	0
Maximum Daily Visitation	Weekday	70	70
	Weekend	70	70
Annual Gallons of Production		15,000	15,000
Annual Tons of Grape Haul		93.8	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	8	8
	Weekend	2	2
Number of Part Time Employees*	Weekday	2	0
	Weekend	2	0
Maximum Daily Visitation	Weekday	70	70
	Weekend	70	70
Annual Gallons of Production		50,000	50,000
Annual Tons of Grape Haul		312.5	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

*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).

BREMER FAMILY WINERY USE MODIFICATION (GHD Prepared)

TRIP GENERATION

Existing Winery					Harvest	Non-Harvest
Maximum Daily Weekday Traffic (Friday)						
	Harvest	*Non-Harvest*				
FT Employees	4	4	3.05 one way trips/employee	FT Employee Daily Trips	12.2	12.2
PT Employees	2	0	1.9 one way trips/employee	PT Employee Daily Trips	3.8	0.0
Max Visitors	70	70	2.6 visitors/vehicle for 2 one way trips	Max Visitor Daily Trips	53.8	53.8
Max Event	0	0	2.6 visitors/vehicle for 2 one way trips	Max Event Daily Trips	0.0	0.0
Gallons of Production	15,000		0.000018 truck trips	Production Daily Trips	0.3	0.3
Tons of Grape Haul#	93.8		0.013889 truck trips	Grape Haul Daily Trips	1.3	0.0
				Total Weekday Daily Trips	72	67
				Total Weekday Peak Hour Trips*	27	25
Maximum Daily Weekend Traffic (Saturday)						
	Harvest	*Non-Harvest*				
FT Employees	2	2	3.05 one way trips/employee	FT Employee Daily Trips	6.1	6.1
PT Employees	2	0	1.9 one way trips/employee	PT Employee Daily Trips	3.8	0.0
Max Visitors	70	70	2.8 visitors/vehicle for 2 one way trips	Max Visitor Daily Trips	50.0	50.0
Max Event	0	0	2.8 visitors/vehicle for 2 one way trips	Max Event Daily Trips	0.0	0.0
Gallons of Production	15,000		0.000018 truck trips	Production Daily Trips	0.3	0.3
Tons of Grape Haul#	93.8		0.013889 truck trips	Grape Haul Daily Trips	1.3	0.0
				Total Weekend Daily Trips	62	57
				Total Weekend Peak Hour Trips*	33	31
Maximum Annual Traffic						
				Total Annual Trips**	23,800	

Proposed Winery					Harvest	Non-Harvest
Maximum Daily Weekday Traffic (Friday)						
	Harvest	*Non-Harvest*				
FT Employees	8	8	3.05 one way trips/employee	FT Employee Daily Trips	24.4	24.4
PT Employees	2	0	1.9 one way trips/employee	PT Employee Daily Trips	3.8	0.0
Max Visitors	70	70	2.6 visitors/vehicle for 2 one way trips	Max Visitor Daily Trips	53.8	53.8
Max Event	0	0	2.6 visitors/vehicle for 2 one way trips	Max Event Daily Trips	0.0	0.0
Gallons of Production	50,000		0.000018 truck trips	Production Daily Trips	0.9	0.9
Tons of Grape Haul#	312.5		0.013889 truck trips	Grape Haul Daily Trips	4.3	0.0
				Total Weekday Daily Trips	88	80
				Total Weekday Peak Hour Trips*	32	29
Maximum Daily Weekend Traffic (Saturday)						
	Harvest	*Non-Harvest*				
FT Employees	2	2	3.05 one way trips/employee	FT Employee Daily Trips	6.1	6.1
PT Employees	2	0	1.9 one way trips/employee	PT Employee Daily Trips	3.8	0.0
Max Visitors	70	70	2.8 visitors/vehicle for 2 one way trips	Max Visitor Daily Trips	50.0	50.0
Max Event	0	0	2.8 visitors/vehicle for 2 one way trips	Max Event Daily Trips	0.0	0.0
Gallons of Production	50,000		0.000018 truck trips	Production Daily Trips	0.9	0.9
Tons of Grape Haul#	312.5		0.013889 truck trips	Grape Haul Daily Trips	4.3	0.0
				Total Weekend Daily Trips	66	57
				Total Weekend Peak Hour Trips*	35	32
Maximum Annual Traffic						
				Total Annual Trips**	27,446	

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**	16	13
	Net New Weekday Peak Hour Trips*	5	4
Maximum Weekend Traffic (Saturday)			
If total net new daily trips is greater than 40, a TIS is required	**Net New Weekend Daily Trips**	4	0
	Net New Weekend Peak Hour Trips*	2	1
Maximum Annual Traffic			
A Traffic Impact Study is NOT Required	**Net New Annual Trips****	3,646	

#Trips associated with Grape Haul represent harvest season only.

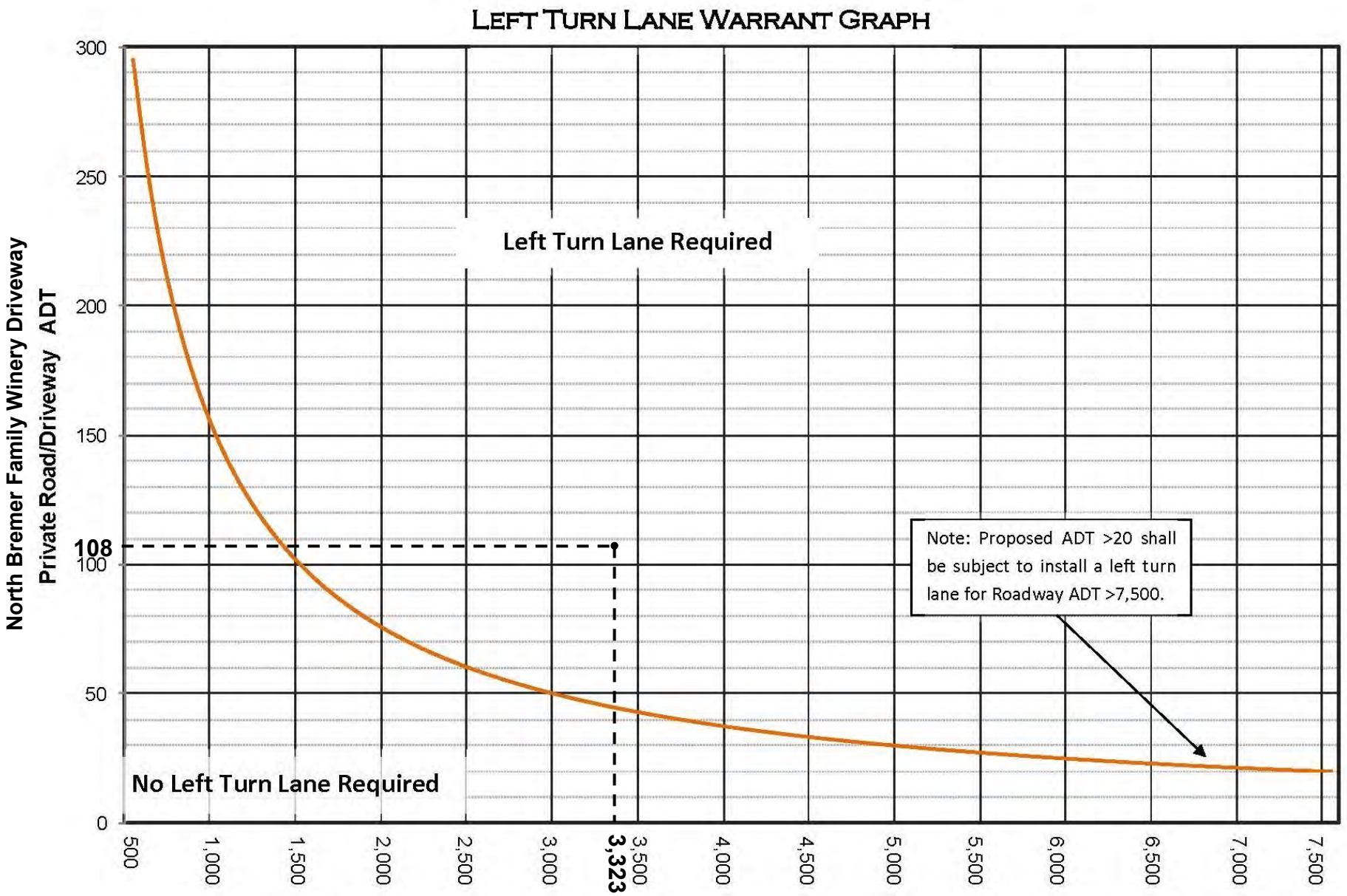
*Weekday peak hour trips are calculated as 38% of daily trips associated with visitors and production plus one trip per employee. Weekend peak hour trips are calculated as 57% of daily trips associated with visitors and production plus one trip per employee.

**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 F

Left-Turn Lane Warrant Sheets

Bremer Family Winery North Driveway
Existing Plus Project Conditions:



Bremer Family Winery Project:
Existing Plus Project Conditions:
Left Turn Lane Is Warranted

Source: Napa County Road & Street Standards, 2023