



Updated Traffic Impact Study for the VJB Vineyard and Cellars



Prepared for the County of Sonoma

Submitted by
W-Trans

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Project Information

File Number: UPE05-0009

Address: 60 Shaw Avenue, Kenwood

APN: 050-275-028 and 050-275-052

Project Name: VJB Vineyard and Cellars

Applicant Name: Vittorio and Henry Belmonte

Property Owner Name: Vittorio and Henry Belmonte



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Executive Summary

The VJB Vineyard and Cellar opened in 2012 under a Conditional Use Permit (CUP) approved in 2009. The current proposal would modify some aspects of this 2009 CUP to better fit with operation as it has evolved over time. While the continued operation is essentially unchanged, the application would limit operating hours to 10:00 a.m. to 4:00 p.m., would limit the number of employees, would modify access by limiting the Maple Avenue driveway to egress only, would adjust the parking supply to include a lot on the opposite side of Shaw Avenue, and would eliminate some requirements for off-site improvements to the adjacent street system.

Based on counts performed at the site, the project currently generates 25 trips during the morning peak hour, 36 trips during the evening peak hour, and 64 trips during the weekend peak hour. Although the weekday peak hour trips would be reduced to only those associated with employees with the proposed operating hours, upon conservatively adding these existing trips to existing and future volumes without the project, the study intersections are expected to operate acceptably except for the northbound Shaw Avenue approach to SR 12, which is expected to operate at LOS E under future p.m. peak hour volumes with the project. Because the increase in delay associated with adding project trips is less than five seconds, the project has a less-than-significant impact in terms of traffic operation. It is further noted that the analysis was based on the current trip generation, while the trip generation with the proposed changes to the CUP would be less, making this a conservative analysis that overstates the project's impact.

Under the current Conditions of Approval (COA), the project was required to install a left-turn lane on SR 12 at Shaw Avenue and a right-turn lane on Shaw Avenue at SR 12. While the project as proposed would provide the northbound right-turn lane, based on the analysis performed, and given the proposed limits to operating hours, it is recommended that the left-turn lane requirement be rescinded. It is recommended that in lieu of the left-turn pocket the applicant install improvements along the northerly side of SR 12 by widening the shoulder to provide space that could be used to pass a vehicle waiting to turn into Shaw Avenue.

The project is expected to generate a nominal number of pedestrian trips, though visitors will need to walk across Shaw Avenue to get to the site from the off-site parking lot. Given the low volumes and low speed on Shaw Avenue, installation of a mid-block crosswalk, as has been suggested by staff, is not recommended. The project should, however, include provision of pedestrian facilities connecting the site's entrance to the off-site parking lot. It is recommended that the site provide at least 18 bicycle parking spaces to accommodate visitors on bicycles.

Introduction

This report presents an analysis of the potential traffic impacts associated with the proposed modifications to the existing Use Permit for VJB Vineyards and Cellars located at 60 Shaw Avenue in the community of Kenwood in the County of Sonoma. The traffic study was completed in accordance with the criteria established by the County of Sonoma and is consistent with standard traffic engineering techniques.

Prelude

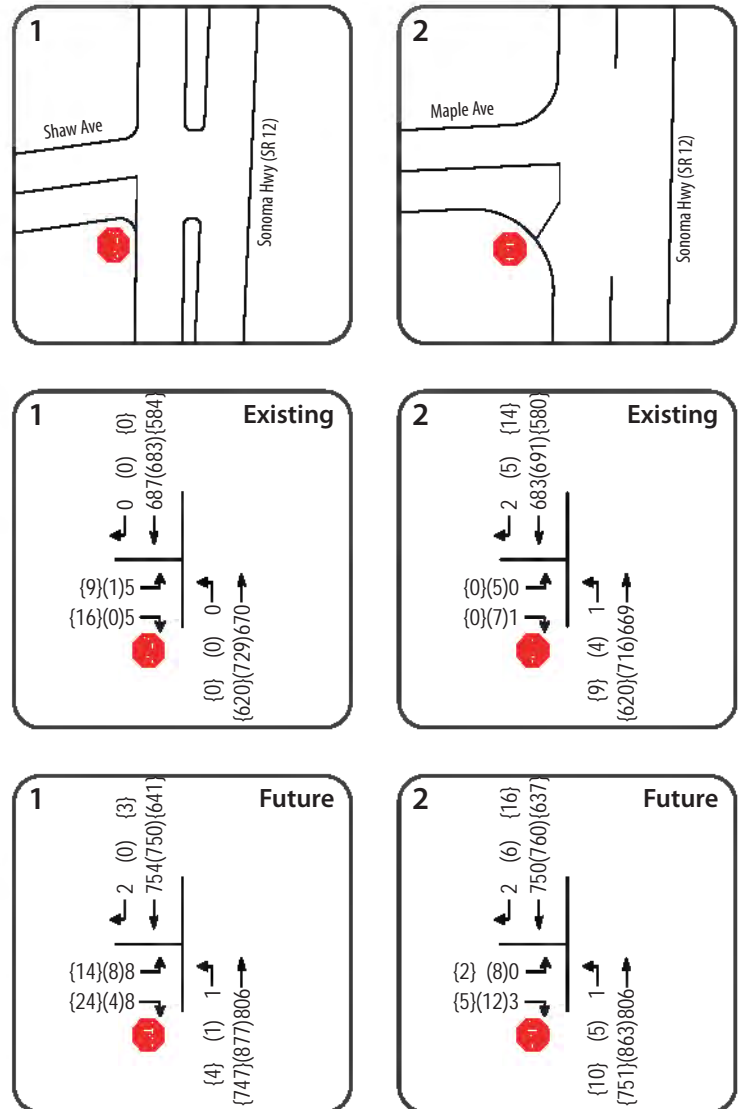
The purpose of a traffic impact study is to provide County staff and policy makers with data that they can use to make an informed decision regarding the potential traffic impacts of a proposed project, and any associated improvements that would be required to mitigate these impacts to a level of insignificance as defined by the County's General Plan or other policies. Vehicular traffic impacts are typically evaluated by determining the number of new trips that the proposed use would be expected to generate, distributing these trips to the surrounding street system based on existing travel patterns or anticipated travel patterns specific to the proposed project, then analyzing the impact the new traffic would be expected to have on critical intersections or roadway segments. Impacts relative to access for pedestrians, bicyclists, and to transit are also addressed.

Project Profile

The project site is developed with the uses as approved in 2009 and as interpreted by the Permits and Resource Management Department (PRMD) since that date, including an outdoor pizza oven and barbeque; outdoor picnic/dining area; food and wine pairing; and retail store, gelato shop and office. Various modifications to the Use Permit as approved are requested, as follows.

- Elimination of the requirement for a left-turn lane on the westbound SR 12 approach to Shaw Avenue and widening of the north shoulder across from the intersection as an alternative.
- The opening of Maple Avenue for egress, only, per Sonoma County Fire Marshall.
- The reduction of off-site parking along Shaw Avenue through paving of the east side of Shaw Avenue back 50 feet from the stop sign to the entrance and signage as outlined in the conditions of approval.
- The development of an off-site parking lot, providing 53 spaces, at 75 Shaw Avenue for the exclusive use of VJB Vineyards & Cellars.
- A maximum of 6 employees (full time equivalent) Monday through Thursday; 9 employees on Friday and 16 employees Saturday and Sunday.
- Change the hours of operation to 10 a.m. to 4 p.m. daily.

The project site location is shown in Figure 1.



LEGEND	
	Study Intersection
xx	Weekday AM Peak Hour Volume
(xx)	Weekday PM Peak Hour Volume
{xx}	Weekend MD Peak Hour Volume

Transportation Setting

Operational Analysis

Study Area and Periods

The study area consists of the following intersections:

1. SR 12/Shaw Avenue
2. SR 12/Maple Avenue

Operating conditions during the weekday a.m. and p.m. peak periods as well as the weekend midday peak period were evaluated to capture the highest potential impacts for the proposed project as well as the highest volumes on the local transportation network. The morning peak hour occurs between 7:00 and 9:00 a.m. and reflects conditions during the home to work or school commute, while the p.m. peak hour occurs between 4:00 and 6:00 p.m. and typically reflects the highest level of congestion during the homeward bound commute. The weekend midday peak period occurs between noon and 2:00 p.m.

Study Intersections

SR 12/Shaw Avenue is a tee intersection with the Shaw Avenue approach stop-controlled.

SR 12/Maple Avenue is a stop-controlled tee intersection.

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

Study Roadways

SR 12 in the vicinity of the proposed project is a two-lane road running in a north-south alignment with narrow shoulders and a posted speed limit of 45 miles per hour (mph). Traffic volumes published by Caltrans on their website indicate an average daily volume of approximately 16,900 vehicles per day. There is an existing center/left-turn lane on SR 12 for about 350 feet near Randolph Avenue, northwest of Shaw Avenue.

Shaw Avenue and Maple Avenue have posted speed limits of 25 mph and are unimproved residential two-lane roads with limited room for parking on the shoulders.

Collision History

The collision history for the study area was reviewed to determine any trends or patterns that may indicate a safety issue. Collision rates were calculated based on records available from the California Highway Patrol as published in their Statewide Integrated Traffic Records System (SWITRS) reports. The most current five-year period available is January 1, 2012 through December 31, 2016.

As presented in Table 1, the calculated collision rates for the study intersections were compared to average collision rates for similar facilities statewide, as indicated in *2014 Collision Data on California State Highways*, California Department of Transportation (Caltrans). Both study intersections have actual rates that are lower than the corresponding Statewide rates, indicating that operation is generally consistent with anticipated safety conditions. The collision rate calculations are provided in Appendix A.

Table 1 – Collision Rates at the Study Intersections

Study Intersection	Number of Collisions (2012-2016)	Calculated Collision Rate (c/mve)	Statewide Average Collision Rate (c/mve)	Number with Injuries	Percent with Injuries	Statewide Average Percent with Injuries
1. SR 12/Shaw Ave	3	0.11	0.14	0	0.0%	38.0%
2. SR 12/Maple Ave	2	0.08	0.14	0	0.0%	38.0%

Note: c/mve = collisions per million vehicles entering

Alternative Modes

Pedestrian Facilities

Pedestrian facilities include sidewalks, crosswalks, pedestrian signal phases, curb ramps, curb extensions, and various streetscape amenities such as lighting, benches, etc. In general, there are limited pedestrian facilities near the project site. Existing gaps and obstacles along the connecting roadways impact convenient and continuous access for pedestrians and present safety concerns in those locations where appropriate pedestrian infrastructure would address potential conflict points.

- **SR 12** – Six- to eight-foot shoulders exist on both sides of SR 12 and are used by pedestrians to access bus stops near the intersections of SR 12 and Laurel Avenue and SR 12 and Greene Street.
- **Shaw Avenue** – There are no sidewalks on Shaw Avenue, so pedestrians walk along the shoulder, where such exists, or in the roadway. Given the low speed, low volume, and straight, flat alignment that provides good sight distance, the current conditions are adequate to serve the limited volume of pedestrian traffic.

Bicycle Facilities

The *Highway Design Manual*, Caltrans, 2017, classifies bikeways into four categories:

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

There are currently no designated bicycle facilities in the immediate vicinity of the winery, though SR 12 has shoulders of at least six feet in width delineated by an edgeline stripe that is used by cyclists. The roadway is identified as having a Class I bike path in the future per the *2014 Sonoma County Bicycle Pedestrian Master Plan*, and the existing right-of-way width appears to be adequate to accommodate this planned future widening.

Transit Facilities

Sonoma County Transit (SCT) provides fixed route bus service in the County of Sonoma. SCT Routes 30 and 34 provide regional service to destinations throughout Santa Rosa and Sonoma Valley and stop on both sides of Sonoma Highway at Greene Street, approximately 1,200 feet west of the site. Route 30 operates seven days a week with approximately one-and-a-half hour headways on weekdays between 6:00 a.m. and 9:00 p.m. and approximately 3-hour headways on weekends from 7:00 a.m. to 7:00 p.m.

Two to three bicycles can be carried on most SCT buses. Bike rack space is on a first come, first served basis. Additional bicycles are allowed on SCT buses at the discretion of the driver.

Dial-a-ride, also known as paratransit, or door-to-door service, is available for those who are unable to independently use the transit system due to a physical or mental disability. SCT Paratransit is designed to serve the needs of individuals with disabilities within Santa Rosa and the greater County of Sonoma area.

Capacity Analysis

Intersection Level of Service Methodologies

Level of Service (LOS) is used to rank traffic operation on various types of facilities based on traffic volumes and roadway capacity using a series of letter designations ranging from A to F. Generally, Level of Service A represents free flow conditions and Level of Service F represents forced flow or breakdown conditions. A unit of measure that indicates a level of delay generally accompanies the LOS designation. The study intersections were analyzed using the unsignalized methodology for two-way stop-controlled intersections published in the *Highway Capacity Manual* (HCM), Transportation Research Board, 2010. This source contains methodologies for various types of intersection control, all of which are related to a measurement of delay in average number of seconds per vehicle.

The “Two-Way Stop-Controlled” intersection capacity method determines a level of service for each minor turning movement by estimating the level of average delay in seconds per vehicle. Results are presented for individual movements together with the weighted overall average delay for the intersection. The ranges of delay associated with the various levels of service are indicated in Table 2.

Table 2 – Two-Way Stop-Controlled Intersection Level of Service Criteria

LOS A	Delay of 0 to 10 seconds. Gaps in traffic are readily available for drivers exiting the minor street.
LOS B	Delay of 10 to 15 seconds. Gaps in traffic are somewhat less readily available than with LOS A, but no queuing occurs on the minor street.
LOS C	Delay of 15 to 25 seconds. Acceptable gaps in traffic are less frequent, and drivers may approach while another vehicle is already waiting to exit the side street.
LOS D	Delay of 25 to 35 seconds. There are fewer acceptable gaps in traffic, and drivers may enter a queue of one or two vehicles on the side street.
LOS E	Delay of 35 to 50 seconds. Few acceptable gaps in traffic are available, and longer queues may form on the side street.
LOS F	Delay of more than 50 seconds. Drivers may wait for long periods before there is an acceptable gap in traffic for exiting the side streets, creating long queues.

Reference: *Highway Capacity Manual*, Transportation Research Board, 2010

Traffic Operation Standards

Because SR 12 and its intersections are under the jurisdiction of Caltrans, the applicable standards for both agencies were considered.

County of Sonoma

Based on the most recent criteria published by the County of Sonoma in May 2016, as updated in June 2019, the project would have a significant traffic impact if it results in any of the following conditions.

1. **On-site roads and frontage improvements** – Proposed on-site circulation and street frontage would not meet the County’s minimum standards for roadway or driveway design, or potentially result in safety hazards, as determined by the County in consultation with a registered Traffic Engineer or Civil Engineer.
2. **Parking** – Proposed on-site parking supply does not meet County standards and does not adequately accommodate parking demand.

3. **Emergency Access** – The project site would have inadequate emergency access.
4. **Alternative Transportation** – The project provides inadequate facilities for alternative transportation modes (e.g., bus turnouts, bicycle racks, pedestrian pathways) and/or the project creates potential conflicts with the County's Complete Streets Policy, other adopted policies, plans, or programs supporting alternative transportation.
5. **Road Hazards** – Road design features that do not meet standards (e.g., sharp curves or skewed intersections) or any perceived incompatible uses (e.g., farm equipment, major bicycle route, rail or pedestrian crossings).
6. **Vehicle Queues** – An impact on projected 95th percentile queues shall be considered significant when any of the following occur:
 - A. The projected queue can be accommodated within the available stacking in a dedicated turn lane (defined as the length of the channelized turn pocket together plus 8 feet in length) but would exceed the available stacking upon adding project-generated traffic. Where a left-turn lane transitions into a two-way left-turn lane, the center turn lane is to be considered part of the available stacking space.
 - B. There is adequate sight distance between the end of the queue and following traffic without the project, and the addition of project traffic increases the queue to a point where sight lines are no longer adequate to meet stopping sight distance criteria.
7. **Signal Warrants** – The addition of the project's vehicle or pedestrian traffic causes an intersection to meet or exceed Caltrans or CA-MUTCD signal warrant criteria.
8. **Turn Lanes** – The addition of project traffic causes an intersection to meet or exceed criteria for provision of a right or left turn lane on an intersection approach.
9. **Sight Lines** – The project constructs an unsignalized intersection (including driveways) and/or adds traffic to an existing unsignalized intersection approach that does not have adequate sight lines based upon Caltrans criteria for State highway intersections and AASHTO criteria for County roadway intersections.
10. **County Intersection Operations** – The County level of service standard for County intersection operations is to maintain a Level of Service D or better pursuant to General Plan Policy CT-4.2. The project would have a significant traffic impact if the project's traffic would cause an intersection currently operating at an acceptable level of service (LOS D or better) to operate at an unacceptable level (LOS E or worse).

If the intersection currently operates or is projected to operate below the County standard, the project's impact is considered significant and cumulatively considerable if it causes the average delay to increase by five seconds or more. The delay will be determined by comparing intersection operations with and without the project's traffic for both the existing baseline and projected future conditions.

The above criteria applies to all controlled intersections except for driveways and minor side streets that have less than 30 vehicle trips per hour per approach or exclusive left turn movement.

11. **County Roadway Operations** – The County level of service standard for County roadway operations is to maintain a Level of Service C pursuant to General Plan Policy CT-4.1; or, for specific roadway segments, the level of service standard adopted in the General Plan Figure CT-3. The project would have a significant traffic impact if the project's traffic would cause a road currently operating at an acceptable level of service (LOS C or better) to operate at an unacceptable level (LOS D or worse).

If a road segment currently operates or is projected to operate below the County standard, the project's impact is considered significant and cumulatively considerable if it causes the average speed to decrease by 2 mph for a roadway operating at LOS D without the project, 1 mph if existing operation is LOS E, and any

reduction in travel speed is significant for a roadway operating at LOS F. The change will be determined by comparing roadway conditions with and without the project's traffic for both the existing baseline and projected future conditions.

12. **State Highways** – Caltrans' general level of service policy on State highways is to maintain the level of service at the transition between LOS C and LOS D. However, level of service goals for specific Caltrans facilities should be taken from transportation planning documents for that facility. A project would have a significant impact if the project traffic would cause the operation of a State highway to operate below LOS C. If a State highway currently operates or is projected to operate below the standard, the project's impact is considered significant and cumulatively considerable if it does not maintain the existing "measure of effectiveness." Measures of effectiveness are: (a) control delay per vehicle for signalized intersections; (b) average control delay per vehicle for unsignalized intersections; (c) average speed for two-lane highways, and (d) density for multi-lane highways.
13. **Mitigation Measures** – In order to reduce project impacts to levels of insignificance, the proposed mitigation measures must result in post-development affected intersections and roadways that have an LOS that is no worse than the County General Plan LOS standard for roadways and intersections, reduce safety impacts to insignificance by bringing the site up to Caltrans or AASHTO design standards, and provide adequate parking and alternative transportation facilities consistent with County plans and policies. The scope of the mitigation measures must reduce the project impacts below the identifiable thresholds mentioned.

The payment of County wide traffic impact fees in and of itself may not be adequate to mitigate a project's local impacts if the existing facilities are already below standard, and the required improvements are not fully funded or programmed to be operational at the time of project completion. The timing of the mitigation measure implementation may require construction of off-site improvements by the developer using a Reimbursement Agreement to pay for any oversized facilities associated with the public share of the improvement pursuant to Section 26-670 of the Sonoma County Code. Traffic impact fees do not address specific impacts related to a particular project. Payment of the traffic impact fee only mitigates or addresses cumulative countywide impacts related to projects that are programmed or listed to be funded by the fees on file with DTPW.

The project's contribution to cumulative impacts must also be addressed in proportion to the project's impact. A proportional fair share contribution to a traffic improvement related to a cumulative impact may be required based on the "Methodology for Calculating Equitable Mitigation Measures" included in Caltrans' *Guide for the Preparation of Traffic Impact Studies* as referenced above. Mitigation measures for both project impacts and cumulative impacts must be implemented prior to occurrence of the impact. An analysis of the timing, funding and responsibilities for implementation of mitigation measures should be included in the traffic study.

Caltrans

Caltrans indicates that they endeavor to maintain operation at the transition from LOS C to LOS D. Based on previous discussions with Caltrans staff, it is understood that the standard is to be applied to the overall average intersection delay and *not* that associated with any single movement or approach. Under this approach, if one movement experiences very high delay and has moderate to high traffic volumes, the overall delay and level of service should reflect the critical nature of the condition. However, if one movement is expected to experience high delay, but has very low traffic volumes, the overall intersection operation will likely still meet Caltrans standards.

Existing Conditions

The Existing Conditions scenario provides an evaluation of current operation based on existing traffic volumes during the three study periods. This condition does not include project-generated traffic volumes, which were

subtracted out of volume data collected on September 16 and 21, 2017 because all the activities associated with the proposed Conditional Use Permit modification are already occurring, so their traffic is included in current traffic streams. Copies of the counts, including those of both vehicles and pedestrians used to derive the site-generated trips deducted from existing counts, are provided in Appendix B.

Intersection Levels of Service

Under existing conditions with project traffic excluded, both study intersections are operating at LOS D or better both overall and on the stop-controlled approach. The existing traffic volumes are shown in Figure 1. A summary of the intersection level of service calculations is contained in Table 3, and copies of the Level of Service calculations are provided in Appendix C. It is noted that the delay indicated for the minor street approaches reflects the average for both left and right turns as neither intersection has separate turn lanes. The output provided in Appendix C presents the delay for the highest movement, but this result is not used for purposes of the evaluation as it represents a single movement on a shared-movement approach and that movement has less than 30 vehicles an hour under any scenario evaluated, so falls below the County's minimum threshold for application of the Level of Service standard.

Table 3 – Existing Peak Hour Intersection Levels of Service

Study Intersection <i>Approach</i>	AM Peak		PM Peak		Weekend Peak	
	Delay	LOS	Delay	LOS	Delay	LOS
1. SR 12/Shaw Ave	0.2	A	0.0	A	0.3	A
<i>NB (Shaw Ave) Approach</i>	<i>23.2</i>	<i>C</i>	<i>29.3</i>	<i>D</i>	<i>17.1</i>	<i>C</i>
2. SR 12/Maple Ave	0.0	A	0.2	A	0.1	A
<i>NB (Maple Ave) Approach</i>	<i>13.5</i>	<i>B</i>	<i>21.7</i>	<i>C</i>	<i>18.2</i>	<i>C</i>

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics*

Future Conditions

Segment volumes for the horizon year of 2040 were obtained from the County's gravity demand model as maintained by the Sonoma County Transportation Authority and translated to turning movement volumes at the study intersections of SR 12/Shaw Avenue and SR 12/Maple Avenue. Because there were no volumes available for Shaw Avenue and Maple Avenue in the County's model, growth factors per approach were calculated based on 2010 and 2040 model volumes on Warm Springs Road and applied to existing volumes at the Shaw and Maple Avenue approaches to arrive at future volumes. The growth factor calculation is provided with the counts in Appendix B.

Under the anticipated Future volumes, the study intersections are expected to operate acceptably at LOS A overall, and at LOS D or better on the side-street approaches. Future volumes are shown in Figure 1 and operating conditions are summarized in Table 4.

Table 4 – Future Peak Hour Intersection Levels of Service

Study Intersection Approach	AM Peak		PM Peak		Weekend Peak	
	Delay	LOS	Delay	LOS	Delay	LOS
1. SR 12/Shaw Ave	0.3	A	0.2	A	0.6	A
NB (Shaw Ave) Approach	30.5	D	31.6	D	21.2	C
2. SR 12/Maple Ave	0.0	A	0.4	A	0.2	A
NB (Maple Ave) Approach	14.4	B	27.0	D	18.1	C

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics*

Project Description

The project consists of changes to the Conditional Use Permit for the VJB Vineyards and Cellars to reflect operation as it has evolved over time and to address requests to modify several Conditions of Approval placed on the project. The specific components of the project addressed in the analysis include the actual current trip generation, the opening of Maple Avenue for egress only, the request not to provide a left-turn lane on SR 12 at Shaw Avenue, and the development of an off-site parking lot, providing 53 spaces, at 75 Shaw Avenue for the exclusive use of VJB Vineyards & Cellars. It is noted that a separate right-turn lane would be provided on Shaw Avenue at SR 12 through elimination of four parking spaces on the east side of Shaw Avenue north of the project entrance. This change to the configuration has not been included as part of the project for analysis purposes to provide a more direct comparison between conditions without and with the project. Operational changes include limiting staff to a maximum of six full-time equivalent employees Monday through Thursday; nine on Friday and 16 Saturday and Sunday, and revision of the hours of operation to 10 a.m. to 4 p.m. daily. Because the changes to the Use Permit would bring the current operation into compliance with existing conditions, the project trips are already on the street network. The actual counts obtained on Thursday, September 21, 2017 and Saturday, September 16, 2017 were therefore used to represent “plus Project” conditions.

Trip Generation

The trip generation for the project was developed based on counts obtained at the site during each of the peak periods. All persons entering or leaving the site either by vehicle to and from the parking lot or walking to nearby parking spaces were observed, and inbound and outbound vehicle counts determined, with outbound trips via the driveway to Maple Avenue counted separately. Based on the counts obtained, the site is currently generating 25 trips during the a.m. peak hour, 36 during the p.m. peak hour, and 64 during the weekend peak hour. These results are shown in Table 5, and these are the volumes that were subtracted from the actual counts to arrive at the volumes used to evaluate “Existing” conditions.

Table 5 – Trip Generation Summary

Land Use	AM Peak Hour			PM Peak Hour			Weekend Peak Hour		
	Trips	In	Out	Trips	In	Out	Trips	In	Out
VJB	25	18	7	36	9	27	64	46	18

Notes: Trip generation based on count of actual site-generated trips.

Trip Distribution

As the actual numbers of trips were counted for each peak period while the turning movement counts were being collected, the pattern used to allocate the project trips to the street network was determined based on the turning

movement counts. Based on the site counts, 55 percent of outbound trips were assigned to Maple Avenue, with the remaining 45 percent using Shaw Avenue. All inbound trips were assigned to Shaw Avenue.

Intersection Operation

Existing plus Project Conditions

Upon the addition of project-related traffic to the Existing volumes, the study intersections are expected to continue operating acceptably at LOS D or better both overall and on the side-street approaches. It is noted that while the project as proposed would result in the addition of a separate right-turn lane on the Shaw Avenue approach to SR 12 that would increase capacity and reduce delay, the intersections was conservatively evaluated with the existing single-lane approach. These results are summarized in Table 6. Project traffic volumes and the resulting Existing plus Project volumes are shown in Figure 2.

Table 6 – Existing plus Project Peak Hour Intersection Levels of Service

Study Intersection Approach	AM Peak		PM Peak		Weekend Peak	
	Delay	LOS	Delay	LOS	Delay	LOS
1. SR 12/Shaw Ave <i>NB (Shaw Ave) Approach</i>	0.3 <i>25.1</i>	A <i>D</i>	0.5 <i>25.9</i>	A <i>D</i>	0.6 <i>19.0</i>	A <i>C</i>
3. SR 12/Maple Ave <i>NB (Maple Ave) Approach</i>	0.1 <i>17.0</i>	A <i>C</i>	0.3 <i>22.4</i>	A <i>C</i>	0.3 <i>17.0</i>	A <i>C</i>

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics*

Finding – The study intersections are expected to continue operating acceptably at the same levels of service upon the addition of project-generated traffic.

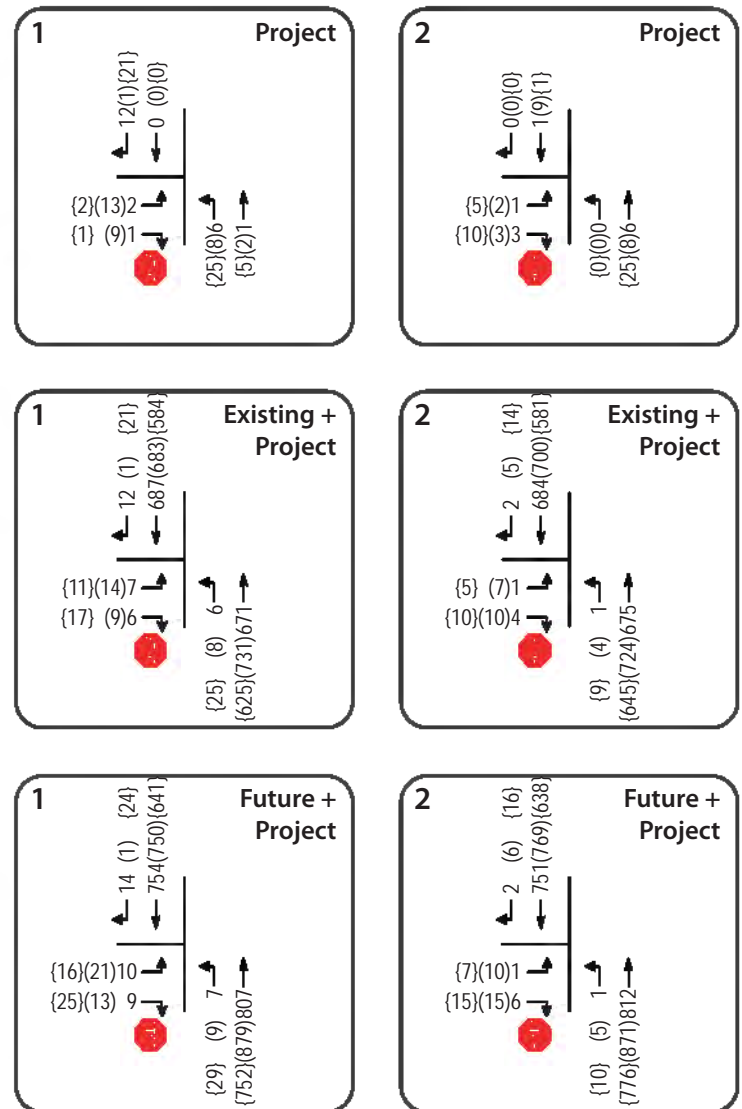
Future plus Project Conditions

Upon the addition of project-generated traffic to the anticipated Future volumes, the study intersections are expected to operate acceptably at LOS A overall and LOS D or better on the side-street approaches, again conservatively treating the Shaw Avenue approach to SR 12 as a single lane and not accounting for the added capacity associated with the separate right-turn lane to be provided by the project. The Future plus Project operating conditions are summarized in Table 7 and the volumes are shown on Figure 2.

Table 7 – Future plus Project Peak Hour Intersection Levels of Service

Study Intersection Approach	AM Peak		PM Peak		Weekend Peak	
	Delay	LOS	Delay	LOS	Delay	LOS
1. SR 12/Shaw Ave <i>NB (Shaw Ave) Approach</i>	0.4 <i>33.1</i>	A <i>D</i>	0.7 <i>34.2</i>	A <i>D</i>	0.8 <i>24.0</i>	A <i>C</i>
2. SR 12/Maple Ave <i>NB (Maple Ave) Approach</i>	0.1 <i>18.2</i>	A <i>C</i>	0.5 <i>28.4</i>	A <i>D</i>	0.4 <i>19.9</i>	A <i>C</i>

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; Results for minor approaches to two-way stop-controlled intersections are indicated in *italics*



LEGEND	
	Study Intersection
xx	Weekday AM Peak Hour Volume
(xx)	Weekday PM Peak Hour Volume
{xx}	Weekend MD Peak Hour Volume

Finding – The study intersections will continue operating acceptably with project traffic added to Future volumes, at the same Levels of Service as without it, indicating a less-than-significant impact on traffic operation.

Travel Demand Analysis

Senate Bill (SB) 743 established a change in the metric to be applied to determining traffic impacts associated with development projects. Rather than the delay-based criteria associated with a Level of Service analysis, the increase in vehicle-miles-travelled (VMT) as a result of a project will be the basis for determining impacts once this new metric is fully vetted and adopted. While the specific methodologies and standards of significance are still under development, consideration was given to the extent to which this project results in increased VMT.

As proposed, many of the visitors to VJB Winery would arrive in limousines or buses, resulting in fewer trips to and from the site than might otherwise occur. The site is located along SR 12, a route that serves numerous other wineries and tasting rooms, so the project is likely to attract a substantial amount of pass-by traffic from guests visiting multiple tasting rooms in the area rather than generating new trips associated with the project itself. SR 12 also attracts a substantial number of bicyclists, and bicycle traffic reduces the VMT. The project would be expected to draw from this bicycle traffic as well, especially when the Class I trail is constructed parallel to SR 12.

Alternative Modes

Pedestrian Facilities

Given the proximity of agricultural and residential land uses, it is reasonable to assume that most winery visitors and employees will travel to and from the site by motor vehicle. Therefore, the winery is expected to generate little to no pedestrian travel except between the buildings and parking lots. The existing parking lot is located to the south of the buildings and provides the accessible parking for the project. Visitors can enter the site directly from the parking lot through a gate at the southeast corner of the outdoor patio. This route provides a virtually flat access route from the accessible parking spaces.

To achieve adequate parking for the uses at the site and avoid use of street parking, it is understood that the parcel at 75 Shaw Avenue has been purchased, and the plan is to use the vacant lot for parking. County staff has expressed concerns regarding pedestrian access between the project site and the off-site parking lot, so the need for a mid-block pedestrian crosswalk was evaluated.

Shaw Avenue has a paved width of about 25 feet south of the project site and narrow shoulders on one or both sides that are used for parking and pedestrian travel. Near SR 12 the road widens to approximately 35 feet. Counts performed in 2017 at the intersection of SR 12/Shaw Avenue indicate that the daily volume on Shaw Avenue is about 340 trips per day, including project-generated traffic. Even with project trips added, the average daily traffic volume on Shaw Avenue remains well below 400 vehicles per day, a volume that is considered “very low” by the American Association of State Highway and Transportation Officials (AASHTO). The speed limit on this short road segment is 25 mph, and field observations indicate that drivers are traveling at or below this speed. Given that sight distance is adequate to allow sufficient visibility between motorists and pedestrians, at this low volume pedestrians should be able to find an adequate gap in traffic to safely cross from the parking lot directly to the VJB site.

Consideration was given to the need for a mid-block crosswalk as a channelizing device and not a safety device. Given that most pedestrians will want to cross in a relatively straight line between the parking lot and the site entrance, there is little need for these walking trips to be channelized. Further, the presence of a mid-block crosswalk may provide pedestrians with a false sense of security and discourage them from waiting for traffic to clear prior to entering the street. It is recommended that a crosswalk be installed at the intersection with SR 12, including provision of space along both sides of Shaw Avenue for pedestrian travel. A copy of the plan showing the proposed improvements is provided in Appendix D. It is noted that this would result in out-of-the way travel, and some pedestrians would be unwilling to increase their trip length by 200 feet so would continue walking directly across Shaw Avenue. However, because this is a local street, pedestrians crossing between the project site and the parking lot would be similar to neighbors walking across to visit one another, an activity that would be normal and well within driver expectation. As a result, while the volume of pedestrian traffic would be greater than normally encountered on a local street, given the geometric and operational characteristics of the street, with adequate facilities provided for those pedestrians who wish to use a specified pathway, facilities would be adequate.

Finding – The project is expected to generate limited pedestrian traffic except between the project and on-site and off-site parking lots. Facilities should be provided to connect the project to the on- and off-site parking lots; this could consist of dedicated paved shoulder areas outside the travel lanes. Given the operational characteristics of Shaw Avenue, it is expected that those pedestrians that wish to do so will be able to cross safely directly between the off-site parking lot and VJB Marketplace.

Recommendation – Installation of the mid-block crosswalk from the site to the parking lot at 75 Shaw Avenue should not be required, though it is recommended that a crosswalk be installed across Shaw Avenue at SR 12 with

space dedicated to pedestrians marked connecting the project entrance to the off-site parking lot via the crosswalk.

Bicycle Facilities

Existing and planned future bicycle facilities, including the future Sonoma Valley Trail paralleling SR 12, together with shared use of minor streets provide adequate access for bicyclists.

Bicycle Storage

The project site plan does not identify the provision of bicycle parking or storage facilities; however, the project should provide bicycle parking consistent with the requirements for the specific uses outlined in Article 86 of the County of Sonoma Code of Ordinances which states that one bicycle parking space should be provided for every five required automobile parking spaces. With a proposed supply of 89 spaces, parking for 18 bicycles is needed.

Finding – Bicycle facilities are adequate to serve the expected demand and would be improved upon installation of the planned Sonoma Valley Trail paralleling SR 12.

Recommendation – Parking to secure at least eighteen bicycles should be provided on-site.

Transit

Existing transit routes are adequate to accommodate project-generated transit trips. Existing stops are within acceptable walking distance of the site.

Finding – Transit facilities serving the project site are adequate.

Access and Circulation

Site Access

Access to the parking lot located on the project site is via a two-way driveway on Shaw Street and a one-way egress to Maple Street. Additional parking is provided in a lot on the opposite side of Shaw Street that is accessed by a two-way driveway.

Sight Distance

Sight distance along Shaw Avenue from the project driveway was evaluated based on sight distance criteria contained in *A Policy on Geometric Design on Highways and Streets* published by American Association of State Highway and Transportation Officials (AASHTO). For drivers exiting a driveway, stopping sight distance recommendations are typically applied. Given the 25-mph speed on both Shaw and Maple avenues, the applicable stopping sight distance recommendation is 155 feet. The available sight lines from all three driveways exceed this and are therefore adequate.

Access Analysis

Left-Turn Lane Warrants

The need for left-turn lanes on SR 12 at Shaw Avenue was evaluated based on criteria contained in the *Intersection Channelization Design Guide*, National Cooperative Highway Research Program (NCHRP) Report No. 279, Transportation Research Board, 1985, as well as a more recent update of the methodology developed by the Washington State Department of Transportation. The NCHRP report references a methodology developed by M. D. Harmelink that includes equations that can be applied to expected or actual traffic volumes to determine the need for a left-turn pocket based on safety issues. Based on our research and discussions with Caltrans staff, this methodology is consistent with the "Guidelines for Reconstruction of Intersections," August 1985, which was referenced in Section 405.2, Left-turn Channelization, of previous editions of the Caltrans *Highway Design Manual*, though this reference has been deleted from the most recent edition of this manual.

Based on the volume warrants alone, a left-turn lane is warranted on SR 12 at Shaw Avenue based on Existing volumes during the p.m. and midday peak periods. However, a review of the collision history for the intersection of SR 12/ Shaw Avenue indicates that only one crash involving a left-turning vehicle (July 2012) was reported during the eight-year period reviewed (2009-2016), indicating that there is not a safety problem at the intersection that would need to be addressed by installing a left-turn lane. Additionally, there are significant construction constraints affecting the design of a left-turn pocket, such as the relocation of existing utility poles and shoulder and drainage facilities. The lack of sufficient right-of-way makes it infeasible for a private party to construct a left-turn pocket. A preliminary design showing the right-of-way that would need to be obtained is provided in Appendix D.

Further, Condition of Approval 41e as set forth for the project in 2007 indicated that the left-turn lane needed to be constructed to allow operation past the hour of 4:00 p.m. Until the left-turn lane was constructed, operation was limited to 10:00 a.m. to 4:00 p.m. Since operation outside of these hours is not currently proposed, there would not be an extension of operating hours that would trigger the need for the left-turn lane, so the left-turn lane should not be required at this time.

However, County staff suggested an alternative improvement that would achieve the desired result of providing space so that following vehicles could pass around a left-turning vehicle if necessary, and improving safety, especially in the case of an inattentive driver approaching a vehicle stopped and waiting to turn left having insufficient time to avoid colliding with the stopped vehicle despite the adequacy of sight distance. The County

has, on numerous occasions, placed a condition that applicants construct a wider shoulder on the opposite side of the street from their driveway, or in this case a side street, so that approaching drivers have adequate space to move around the vehicle stopped before turning left. This alternative improvement has been applied in other places along state highways, including SR 116 and 121. Under this alternative the shoulder on the northeast side of the roadway would need to be widened to a minimum of eight feet for a total distance of 200 feet: 100 feet on each side of the centerline of Shaw Avenue. The widening of the shoulder results in conditions that are an improvement over existing conditions, leading to better operation with the project than without it, regardless of any increase in left turns associated with the project, and therefore a less-than-significant impact due to the project. While not required to accommodate the project as currently proposed, the applicant has agreed to construct this improvement.

Parking

The project was analyzed to determine whether the proposed parking supply would be sufficient for the anticipated parking demand. This analysis provides an update to the previous parking study conducted in a report titled, *Revised Traffic and Parking Analysis for VJB Marketplace Modification*, July 16, 2015. The proposed project's parking supply consists of 37 spaces on site and an additional 53 spaces in an off-site parking lot at 75 Shaw Avenue for the exclusive use of VJB Vineyards & Cellars, for a total supply of 90 spaces.

Required Parking

Based on the Sonoma County Zoning Code, Section 26-86-010, one parking space is required per 60 square feet of dining area, one space per 200 square feet of general retail, and one space per 250 square feet of office space. Project plans include 3,654 square feet of dining area (including the picnic area, bar, covered area adjacent to the wine cellar, and area in front of the gelato bar), 425 square feet of retail space, which includes the market, and 306 square feet of office space. This equates to a parking requirement of 65 spaces. With plans to provide 90 spaces, the supply is adequate to meet County codes with a surplus of 25 spaces. Table 8 provides a summary of the County's parking requirements.

Table 8 – Parking Requirements per Sonoma County Municipal Code			
Land Use	Units	County Requirements	
		Rate	Spaces Required
Dining	3,654 sf	1.0 per 60 sf	61
Market (retail)	425 sf	1.0 per 200 sf	2
Office	414 sf	1.0 per 250 sf	2
Total Parking Required			65

Notes: sf = square feet

The proposed project also includes an on-site limousine and bus drop off which would also reduce the parking demand generated by the project by increasing the vehicle occupancy above the typical 2.5 persons per vehicle.

Finding – The proposed parking supply would accommodate the anticipated parking demand with a surplus of 25 spaces.

Conclusions and Recommendations

Conclusions

- Based on the counts obtained, the site currently generates 25 trips during the a.m. peak hour, 36 during the p.m. peak hour, and 64 during the weekend peak hour.
- Under existing conditions with project traffic excluded, both study intersections are operating at LOS A overall and at LOS D or better on the stop-controlled approaches.
- Under anticipated Future volumes, both study intersections are expected to operate at acceptable service levels overall and on the side-street approaches.
- Upon the addition of project-related traffic to the Existing and Future volumes, the study intersections are expected to continue operating acceptably at LOS D or better both overall and on the side-street approaches.
- Pedestrian traffic associated with the project is expected to be minimal and comprised primarily of visitors walking from and to the off-site parking lot (there is a direct connection from the patio to the on-site parking lot). There are safety concerns related to the mid-block crosswalk proposed by the County, especially the potential for pedestrians to walk out in front of oncoming traffic due to a false sense of security. Given the availability of adequate sight distance and low speeds and volumes on Shaw Avenue, pedestrians are expected to be able to cross relatively easily and safely. However, dedicated space for pedestrians should be provided between the project entrance and the off-site parking lot.
- There are no bicycle facilities serving the project site. However, striped eight-foot shoulders on SR 12 are used by bicycles and a bike trail parallel to SR 12 is planned for the future.
- Transit facilities connect the site to Santa Rosa to the west and Sonoma to the east, and the site is served by bus stops near the intersection of SR 12/Greene Street. While few transit trips to and from the site are expected, the available transit facilities are adequate to serve those that may occur.
- The available sight lines for all three project driveways exceed the recommended 155 feet for roads with 25 mph speed limits and are therefore adequate.
- A left-turn lane is not warranted on westbound SR 12 at the intersection with Shaw Avenue due to construction constraints and safe operation of the intersection indicated by the lack of collisions for the past nine years.

Recommendations

- While the volume at the intersection of SR 12/Shaw Avenue indicates that a left-turn lane for the westbound approach may be warranted, the incidence of only one reported collision in nine years indicates that there is not a safety problem that warrants attention. As a result, and in consideration of the geometric, right-of-way and utility constraints associated with adding a left-turn pocket as well as the current proposal to limit operating hours and closing at 4:00 p.m., it is recommended that the requirement for the left-turn pocket be eliminated.
- It is recommended that the applicant widen the shoulder on the north side of SR 12 for 200 feet (100 feet on either side of Shaw Avenue) to provide recovery space if a driver needs to pass around a vehicle waiting to turn left into Shaw Avenue.
- A mid-block crosswalk between the off-site parking lot and the VJB site may pose safety concerns to pedestrians and is therefore not recommended.
- The project should mark space that can be used by pedestrians connecting the entrance to the off-site parking lot, including a crosswalk on Shaw Avenue at SR 12.
- Secure parking facilities for at least 18 bicycles should be provided on site.

Study Participants and References

Study Participants

Principal in Charge	Dalene J. Whitlock, PE, PTOE
Assistant Engineer	Cameron Nye, EIT, Kevin Rangel, EIT
Graphics	Hannah Yung-Boxdell
Editing/Formatting	Alex Scrobonia

References

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A Policy on Geometric Design of Highways and Streets, 6th Edition, American Association of State Highway and Transportation Officials, 2011
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SOX227





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Appendix A

Collision Rate Calculations



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Intersection Collision Rate Calculations

VJB Marketplace Modification

Intersection # 1: SR 12 & Shaw Avenue

Date of Count: Thursday, September 21, 2017

Number of Collisions: 3

Number of Injuries: 0

Number of Fatalities: 0

ADT: 14500

Start Date: January 1, 2012

End Date: December 31, 2016

Number of Years: 5

Intersection Type: Tee

Control Type: Stop & Yield Controls

Area: Suburban

$$\text{collision rate} = \frac{\text{Number of Collisions} \times 1 \text{ Million}}{\text{ADT} \times 365 \text{ Days per Year} \times \text{Number of Years}}$$

$$\text{collision rate} = \frac{3}{14,500} \times \frac{1,000,000}{365 \times 5}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Intersection	0.11 c/mve	0.0%	0.0%
Statewide Average*	0.14 c/mve	0.7%	38.0%

ADT = average daily total vehicles entering intersection

c/mve = collisions per million vehicles entering intersection

* 2013 Collision Data on California State Highways, Caltrans

Intersection # 2: State Route 12 & Maple Avenue

Date of Count: Thursday, September 21, 2017

Number of Collisions: 2

Number of Injuries: 0

Number of Fatalities: 0

ADT: 14500

Start Date: January 1, 2012

End Date: December 31, 2016

Number of Years: 5

Intersection Type: Tee

Control Type: Stop & Yield Controls

Area: Suburban

$$\text{collision rate} = \frac{\text{Number of Collisions} \times 1 \text{ Million}}{\text{ADT} \times 365 \text{ Days per Year} \times \text{Number of Years}}$$

$$\text{collision rate} = \frac{2}{14,500} \times \frac{1,000,000}{365 \times 5}$$

	Collision Rate	Fatality Rate	Injury Rate
Study Intersection	0.08 c/mve	0.0%	0.0%
Statewide Average*	0.14 c/mve	0.7%	38.0%

ADT = average daily total vehicles entering intersection

c/mve = collisions per million vehicles entering intersection

* 2013 Collision Data on California State Highways, Caltrans



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Appendix B

Intersection Turning Movement Counts



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National Data & Surveying Services

Intersection Turning Movement Count

Location: SR 12 & Shaw Ave
City: Kenwood
Control:

Project ID: 17-07753-001
Date: 9/21/2017

Total

NS/EW Streets:	SR 12				SR 12				Shaw Ave				Shaw Ave				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	
7:00 AM	3	134	0	0	0	141	1	0	1	0	0	0	0	0	0	0	280
7:15 AM	1	162	0	0	0	139	3	0	2	0	0	0	0	0	0	0	307
7:30 AM	0	142	0	0	0	174	0	0	2	0	0	0	0	0	0	0	318
7:45 AM	0	169	0	0	0	182	3	0	2	0	1	0	0	0	0	0	357
8:00 AM	3	179	0	0	0	149	1	0	1	0	3	0	0	0	0	0	336
8:15 AM	2	188	0	0	0	181	3	0	2	0	0	0	0	0	0	0	376
8:30 AM	1	135	0	0	0	175	5	0	2	0	2	0	0	0	0	0	320
8:45 AM	1	121	0	0	0	168	3	0	2	0	2	0	0	0	0	0	297
TOTAL VOLUMES :	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
APPROACH %'s :	11	1230	0	0	0	1309	19	0	14	0	8	0	0	0	0	0	2591
PEAK HR :	07:45 AM - 08:45 AM																TOTAL
PEAK HR VOL :	6	671	0	0	0	687	12	0	7	0	6	0	0	0	0	0	1389
PEAK HR FACTOR :	0.500	0.892	0.000	0.000	0.000	0.944	0.600	0.000	0.875	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.924
	0.891				0.945				0.813								

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	
4:00 PM	4	184	0	0	0	171	0	0	5	0	0	0	0	0	0	0	364
4:15 PM	2	193	0	0	0	153	0	0	6	0	2	0	0	0	0	0	356
4:30 PM	2	169	0	0	0	184	1	0	1	0	4	0	0	0	0	0	361
4:45 PM	0	185	0	0	0	175	0	0	2	0	3	0	0	0	0	0	365
5:00 PM	2	164	0	0	0	166	1	0	5	0	1	0	0	0	0	0	339
5:15 PM	1	210	0	0	0	150	0	0	2	0	1	0	0	0	0	0	364
5:30 PM	0	178	0	0	0	183	0	0	1	0	0	0	0	0	0	0	362
5:45 PM	1	160	0	0	0	167	3	0	1	0	0	0	0	0	0	0	332
TOTAL VOLUMES :	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
APPROACH %'s :	12	1443	0	0	0	1349	5	0	23	0	11	0	0	0	0	0	2843
PEAK HR :	04:00 PM - 05:00 PM																TOTAL
PEAK HR VOL :	8	731	0	0	0	683	1	0	14	0	9	0	0	0	0	0	1446
PEAK HR FACTOR :	0.500	0.947	0.000	0.000	0.000	0.928	0.250	0.000	0.583	0.000	0.563	0.000	0.000	0.000	0.000	0.000	0.990
	0.947				0.924				0.719								

National Data & Surveying Services

Intersection Turning Movement Count

Location: SR 12 & Shaw Ave
City: Kenwood
Control:

Project ID: 17-07753-001
Date: 2017-09-16

Total

NS/EW Streets:	SR 12				SR 12				Shaw Ave				Shaw Ave				
NOON	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	0 NL	0 NT	0 NR	0 NU	0 SL	0 ST	0 SR	0 SU	0 EL	0 ET	0 ER	0 EU	0 WL	0 WT	0 WR	0 WU	
12:00 PM	10	161	0	0	0	127	3	0	0	0	0	0	0	0	0	0	301
12:15 PM	3	159	0	0	0	127	4	0	2	0	3	0	0	0	0	0	298
12:30 PM	9	144	0	0	0	154	5	0	2	0	1	0	0	0	0	0	315
12:45 PM	5	164	0	0	0	134	6	0	5	0	6	0	0	0	0	0	320
1:00 PM	5	161	0	0	0	146	6	0	2	0	6	0	0	0	0	0	326
1:15 PM	6	156	0	0	0	150	4	0	2	0	4	0	0	0	0	0	322
1:30 PM	7	163	0	0	0	116	5	1	7	0	4	0	0	0	0	0	303
1:45 PM	6	143	0	1	0	156	8	0	6	0	7	0	0	0	0	0	327
TOTAL VOLUMES :	NL 51	NT 1251	NR 0	NU 1	SL 0	ST 1110	SR 41	SU 1	EL 26	ET 0	ER 31	EU 0	WL 0	WT 0	WR 0	WU 0	TOTAL 2512
APPROACH %'s :	3.91%	96.01%	0.00%	0.08%	0.00%	96.35%	3.56%	0.09%	45.61%	0.00%	54.39%	0.00%					
PEAK HR :	12:30 PM - 01:30 PM																TOTAL
PEAK HR VOL :	25	625	0	0	0	584	21	0	11	0	17	0	0	0	0	0	1283
PEAK HR FACTOR :	0.694	0.953	0.000	0.000	0.000	0.948	0.875	0.000	0.550	0.000	0.708	0.000	0.000	0.000	0.000	0.000	0.984
	0.962				0.951				0.636								

National Data & Surveying Services

Intersection Turning Movement Count

Location: SR 12 & Maple Ave
City: Kenwood
Control:

Project ID: 17-07753-002
Date: 9/21/2017

Total

NS/EW Streets:	SR 12				SR 12				Maple Ave				Maple Ave				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	
7:00 AM	0	135	0	0	0	142	0	0	1	0	1	0	0	0	0	0	279
7:15 AM	0	160	0	0	0	139	1	0	0	0	0	0	0	0	0	0	300
7:30 AM	0	143	0	0	0	170	0	0	2	0	1	0	0	0	0	0	316
7:45 AM	0	170	0	0	0	189	1	0	0	0	2	0	0	0	0	0	362
8:00 AM	1	173	0	0	0	144	0	0	0	0	0	0	0	0	0	0	318
8:15 AM	0	190	0	0	0	172	0	0	1	0	1	0	0	0	0	0	364
8:30 AM	0	142	0	0	0	179	1	0	0	0	1	0	0	0	0	0	323
8:45 AM	2	117	0	0	0	178	0	0	0	0	3	0	0	0	0	0	300
TOTAL VOLUMES :	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
APPROACH %'s :	3	1230	0	0	0	1313	3	0	4	0	9	0	0	0	0	0	2562
PEAK HR :	07:45 AM - 08:45 AM																TOTAL
PEAK HR VOL :	1	675	0	0	0	684	2	0	1	0	4	0	0	0	0	0	1367
PEAK HR FACTOR :	0.250	0.888	0.000	0.000	0.000	0.905	0.500	0.000	0.250	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.939
	0.889				0.903				0.625								

NS/EW Streets:	SR 12				SR 12				Maple Ave				Maple Ave				
PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	
4:00 PM	1	179	0	0	0	169	3	0	4	0	4	0	0	0	0	0	360
4:15 PM	1	191	0	0	0	151	0	0	2	0	3	0	0	0	0	0	348
4:30 PM	1	169	0	0	0	189	1	0	1	0	2	0	0	0	0	0	363
4:45 PM	1	185	0	0	0	191	1	0	0	0	1	0	0	0	0	0	379
5:00 PM	1	165	0	0	0	166	1	0	1	0	0	0	0	0	0	0	334
5:15 PM	2	203	0	0	0	140	1	0	1	0	1	0	0	0	0	0	348
5:30 PM	1	181	0	0	0	189	0	0	2	0	2	0	0	0	0	0	375
5:45 PM	0	154	0	0	0	162	0	0	0	0	0	0	0	0	0	0	316
TOTAL VOLUMES :	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
APPROACH %'s :	8	1427	0	0	0	1357	7	0	11	0	13	0	0	0	0	0	2823
PEAK HR :	04:00 PM - 05:00 PM																TOTAL
PEAK HR VOL :	4	724	0	0	0	700	5	0	7	0	10	0	0	0	0	0	1450
PEAK HR FACTOR :	1.000	0.948	0.000	0.000	0.000	0.916	0.417	0.000	0.438	0.000	0.625	0.000	0.000	0.000	0.000	0.000	0.956
	0.948				0.918				0.531								

National Data & Surveying Services

Intersection Turning Movement Count

Location: SR 12 & Maple Ave
City: Kenwood
Control:

Project ID: 17-07753-002
Date: 2017-09-16

Total

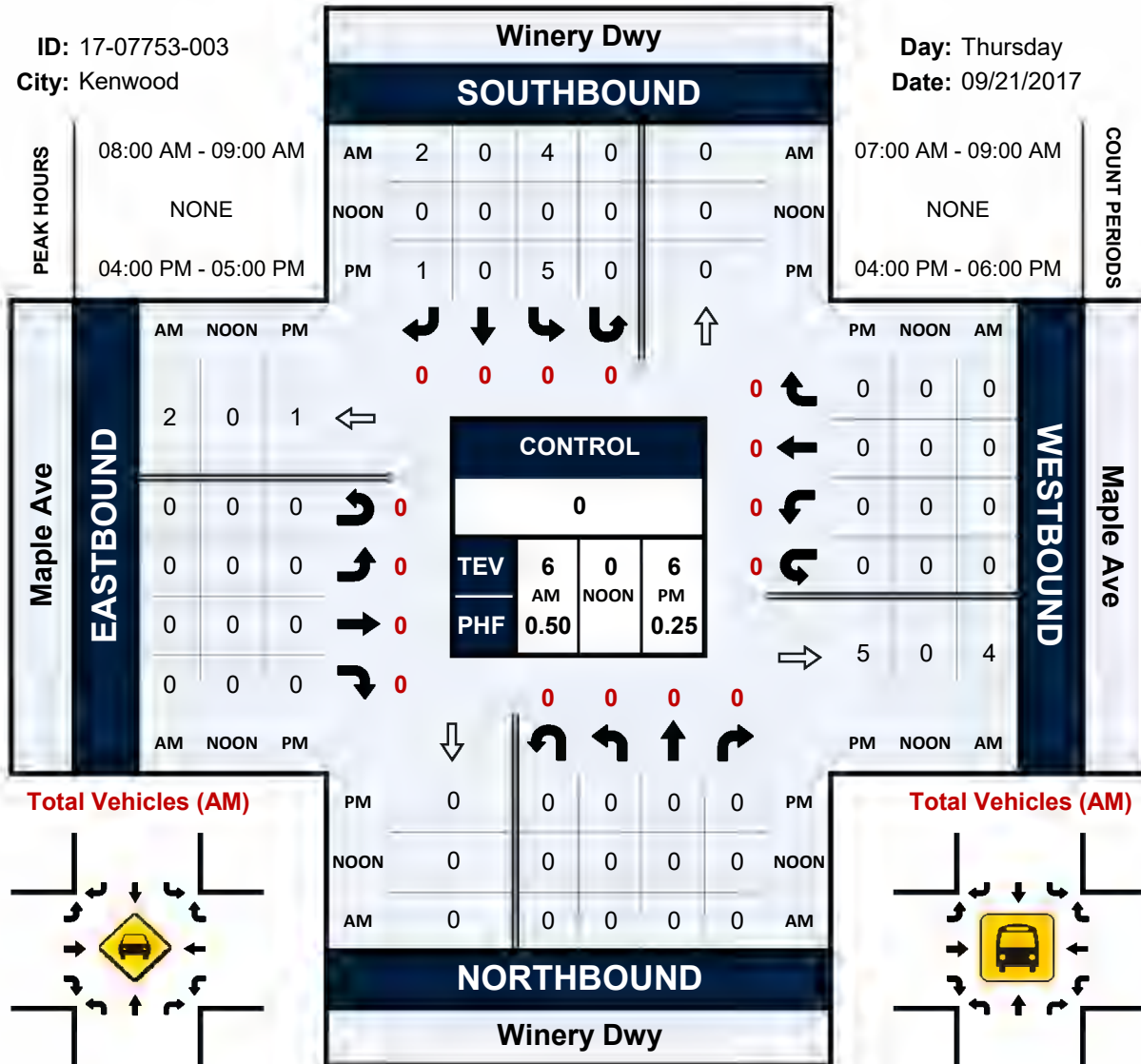
NS/EW Streets:	SR 12				SR 12				Maple Ave				Maple Ave				
NOON	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	0 NL	0 NT	0 NR	0 NU	0 SL	0 ST	0 SR	0 SU	0 EL	0 ET	0 ER	0 EU	0 WL	0 WT	0 WR	0 WU	
12:00 PM	1	170	0	0	0	120	4	0	2	0	1	0	0	0	0	0	298
12:15 PM	2	154	0	0	0	132	1	0	2	0	1	0	0	0	0	0	292
12:30 PM	5	159	0	0	0	153	1	1	0	0	4	0	0	0	0	0	323
12:45 PM	1	169	0	0	0	134	2	0	1	0	3	0	0	0	0	0	310
1:00 PM	2	162	0	0	0	145	6	0	0	0	1	0	0	0	0	0	316
1:15 PM	1	155	0	0	0	149	5	0	4	0	2	0	0	0	0	0	316
1:30 PM	2	164	0	0	0	118	2	0	3	0	8	0	0	0	0	0	297
1:45 PM	2	150	0	0	0	162	2	0	1	0	3	0	0	0	0	0	320
TOTAL VOLUMES :	NL 16	NT 1283	NR 0	NU 0	SL 0	ST 1113	SR 23	SU 1	EL 13	ET 0	ER 23	EU 0	WL 0	WT 0	WR 0	WU 0	TOTAL 2472
APPROACH %'s :	1.23%	98.77%	0.00%	0.00%	0.00%	97.89%	2.02%	0.09%	36.11%	0.00%	63.89%	0.00%					
PEAK HR :	12:30 PM - 01:30 PM																TOTAL
PEAK HR VOL :	9	645	0	0	0	581	14	1	5	0	10	0	0	0	0	0	1265
PEAK HR FACTOR :	0.450	0.954	0.000	0.000	0.000	0.949	0.583	0.250	0.313	0.000	0.625	0.000	0.000	0.000	0.000	0.000	0.979
	0.962				0.961				0.625								

Winery Dwy & Maple Ave

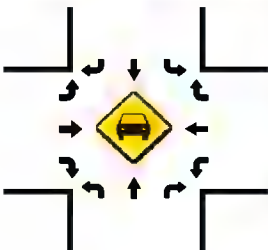
Peak Hour Turning Movement Count

ID: 17-07753-003
City: Kenwood

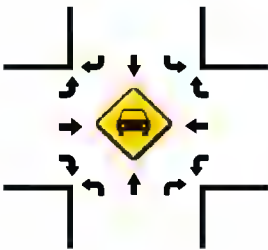
Day: Thursday
Date: 09/21/2017



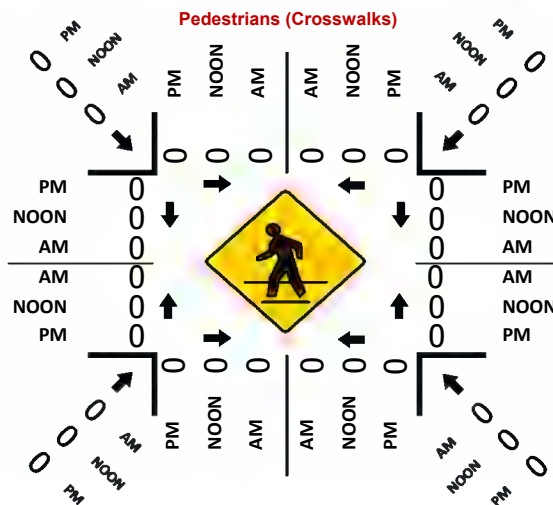
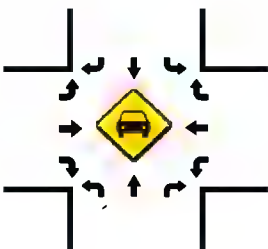
Total Vehicles (AM)



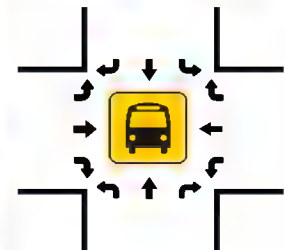
Total Vehicles (NOON)



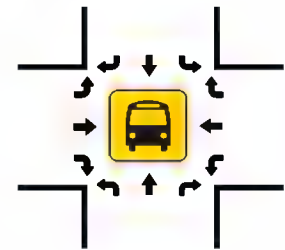
Total Vehicles (PM)



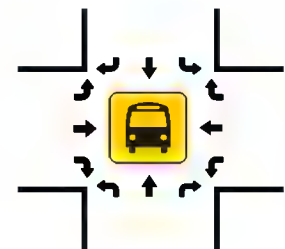
Total Vehicles (AM)



Total Vehicles (NOON)



Total Vehicles (PM)

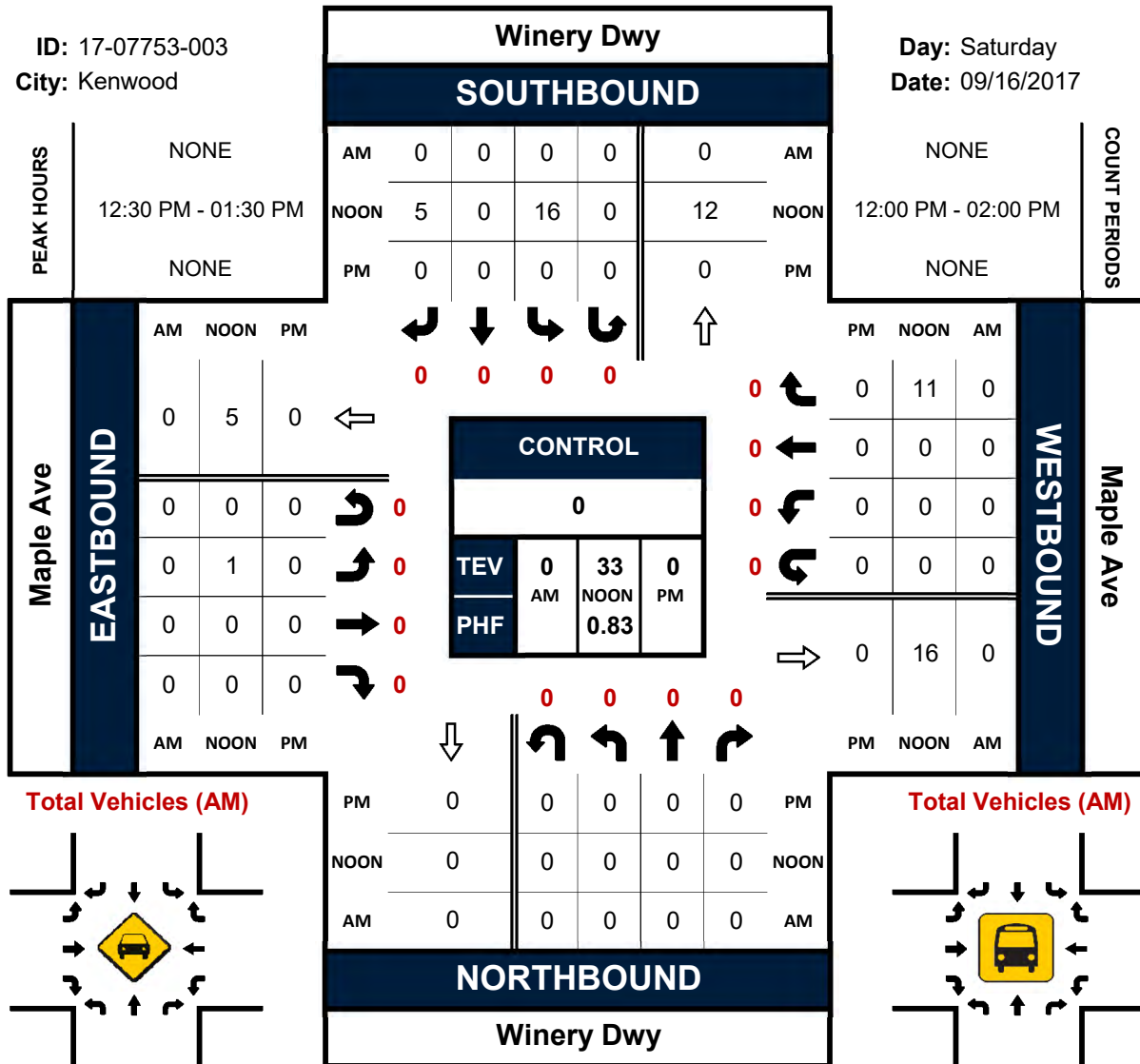


Winery Dwy & Maple Ave

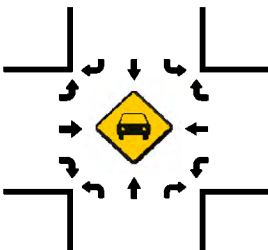
Peak Hour Turning Movement Count

ID: 17-07753-003
City: Kenwood

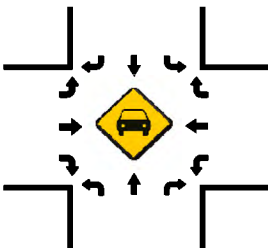
Day: Saturday
Date: 09/16/2017



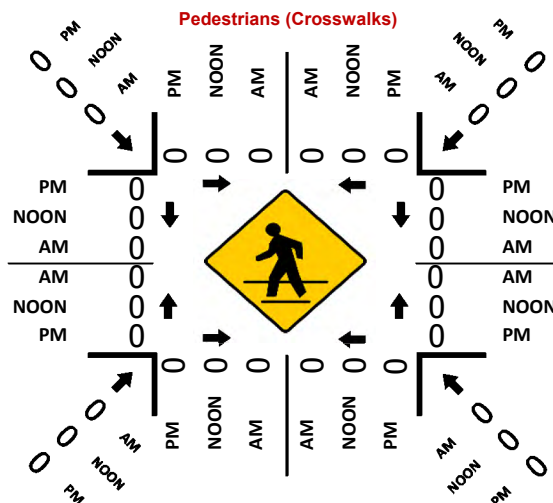
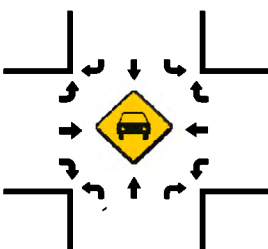
Total Vehicles (AM)



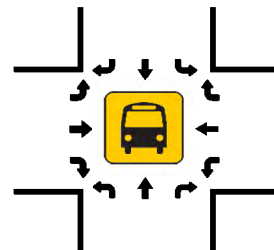
Total Vehicles (NOON)



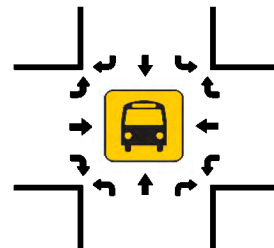
Total Vehicles (PM)



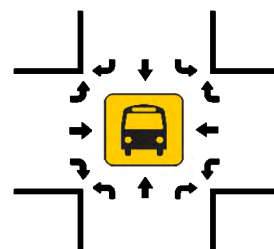
Total Vehicles (AM)



Total Vehicles (NOON)



Total Vehicles (PM)



In Out Study

Locations: 60 Shaw Ave

City: Kenwood,CA

Day: Saturday

Date: 9/16/2017

Time	Entrance 1	
	In	Out
12:00	13	1
12:15	3	2
12:30	13	2
12:45	6	5
13:00	10	4
13:15	10	3
13:30	6	3
13:45	13	14

Time	Entrance 2A	
	In	Out
12:00	2	1
12:15	3	1
12:30	6	0
12:45	5	2
13:00	3	1
13:15	8	4
13:30	4	7
13:45	8	11

Time	Entrance 2B	
	In	Out
12:00	0	0
12:15	0	0
12:30	0	1
12:45	2	1
13:00	0	0
13:15	1	1
13:30	0	0
13:45	0	0

Ped Grouping Study

Locations: 60 Shaw Ave

City: Kenwood,CA

Day: Thursday

Date: 9/21/2017

Time	Entrance 1	
	In	Out
7:00	1	0
7:15	2	0
7:30	0	0
7:45	2	1
8:00	0	0
8:15	1	0
8:30	1	0
8:45	0	1

Time	Entrance 2A	
	In	Out
7:00	2	2
7:15	3	2
7:30	1	0
7:45	2	1
8:00	3	1
8:15	8	1
8:30	2	5
8:45	6	5

Time	Entrance 2B	
	In	Out
7:00	0	0
7:15	0	0
7:30	0	0
7:45	0	0
8:00	0	0
8:15	0	0
8:30	0	0
8:45	0	0

Time	Entrance 1	
	In	Out
4:00	3	5
4:15	1	1
4:30	0	5
4:45	2	2
5:00	-	-
5:15	-	-
5:30	-	-
5:45	-	-

Time	Entrance 2A	
	In	Out
4:00	1	3
4:15	1	2
4:30	0	1
4:45	0	1
5:00	-	-
5:15	-	-
5:30	-	-
5:45	-	-

Time	Entrance 2B	
	In	Out
4:00	0	0
4:15	1	3
4:30	1	3
4:45	0	2
5:00	-	-
5:15	-	-
5:30	-	-
5:45	-	-

Note: Entrance 1: Gate closed at 5PM

Entrance 2A: Gate closed at 5PM

Entrance 2B: Gate closed at 5PM

Future Volume Growth Factor Derivation
JVB Marketplace Traffic Analysis

SR 12		NB	
	Model Years	2010	2040
	Model Segment Volumes	448	567
	Current Year	2017	
	Growth Factor	1.203	

SR 12		NB	
	Model Years	2010	2040
	Model Segment Volumes	843	951
	Current Year	2017	
	Growth Factor	1.098	

Shaw/Maple Ave		EB	
	Model Years	2010	2040
	Model Segment Volumes	82	133
	Current Year	2017	
	Growth Factor	1.477	

Shaw Ave/Maple Ave		WB	
	Model Years	2010	2040
	Model Segment Volumes	177	210
	Current Year	2017	
	Growth Factor	1.143	

Peak Period: Weekday PM

Intersection: SR 12/Shaw Avenue

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Volume Existing	14	9	8	731	683	1
Volume Future	21	13	9	879	750	1



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Appendix C

Intersection Level of Service Calculations





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Intersection Level Of Service Report
Intersection 1: SR 12 and Shaw Avenue

Control Type:	Two-way stop	Delay (sec / veh):	31.7
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.036

Intersection Setup

Name	SR 12		SR 12		Shaw Avenue	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration	┌		└		┐	
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	45.00		45.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	SR 12		SR 12		Shaw Avenue	
Base Volume Input [veh/h]	0	670	687	0	5	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	670	687	0	5	5
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	182	187	0	1	1
Total Analysis Volume [veh/h]	0	728	747	0	5	5
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0




Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.01	0.01	0.00	0.04	0.01
d_M, Delay for Movement [s/veh]	9.18	0.00	0.00	0.00	31.73	14.59
Movement LOS	A	A	A	A	D	B
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.00	0.15	0.15
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	0.00	3.76	3.76
d_A, Approach Delay [s/veh]	0.00		0.00		23.16	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	0.16					
Intersection LOS	D					

Intersection Level Of Service Report
Intersection 2: SR 12 and Maple Avenue

Control Type:	Two-way stop	Delay (sec / veh):	29.8
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.000

Intersection Setup

Name	SR 12		SR 12		Maple Avenue	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	45.00		45.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	SR 12		SR 12		Maple Avenue	
Base Volume Input [veh/h]	1	669	683	2	0	1
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1	669	683	2	0	1
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	178	182	1	0	0
Total Analysis Volume [veh/h]	1	712	727	2	0	1
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings




Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.01	0.01	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	9.12	0.00	0.00	0.00	29.75	13.52
Movement LOS	A	A	A	A	D	B
95th-Percentile Queue Length [veh]	9.11	9.11	0.00	0.00	0.01	0.01
95th-Percentile Queue Length [ft]	227.86	227.86	0.00	0.00	0.18	0.18
d_A, Approach Delay [s/veh]	0.01		0.00		13.52	
Approach LOS	A		A		B	
d_I, Intersection Delay [s/veh]	0.02					
Intersection LOS	D					

Intersection Level Of Service Report					
Intersection 1: SR 12 and Shaw Avenue					
Control Type:	Two-way stop	Delay (sec / veh):	29.3		
Analysis Method:	HCM 6th Edition	Level Of Service:	D		
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.007		

Intersection Setup

Name	SR 12		SR 12		Shaw Avenue	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	45.00		45.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	SR 12		SR 12		Shaw Avenue	
Base Volume Input [veh/h]	0	729	683	0	1	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	729	683	0	1	0
Peak Hour Factor	0.9900	0.9900	0.9900	0.9900	0.9900	0.9900
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	184	172	0	0	0
Total Analysis Volume [veh/h]	0	736	690	0	1	0
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.01	0.01	0.00	0.01	0.00
d_M, Delay for Movement [s/veh]	8.98	0.00	0.00	0.00	29.30	13.25
Movement LOS	A	A	A	A	D	B
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.00	0.02	0.02
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	0.00	0.51	0.51
d_A, Approach Delay [s/veh]	0.00		0.00		29.30	
Approach LOS	A		A		D	
d_I, Intersection Delay [s/veh]	0.02					
Intersection LOS	D					

Intersection Level Of Service Report
Intersection 2: SR 12 and Maple Avenue

Control Type:	Two-way stop	Delay (sec / veh):	32.0
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.036

Intersection Setup

Name	SR 12		SR 12		Maple Avenue	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration	├		┤		┴	
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	45.00		45.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	SR 12		SR 12		Maple Avenue	
Base Volume Input [veh/h]	4	716	691	5	5	7
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	716	691	5	5	7
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	186	180	1	1	2
Total Analysis Volume [veh/h]	4	746	720	5	5	7
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0




Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.01	0.01	0.00	0.04	0.02
d_M, Delay for Movement [s/veh]	9.12	0.00	0.00	0.00	32.00	14.32
Movement LOS	A	A	A	A	D	B
95th-Percentile Queue Length [veh]	10.59	10.59	0.00	0.00	0.17	0.17
95th-Percentile Queue Length [ft]	264.71	264.71	0.00	0.00	4.15	4.15
d_A, Approach Delay [s/veh]	0.05		0.00		21.68	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]			0.20			
Intersection LOS			D			

Intersection Level Of Service Report
Intersection 1: SR 12 and Shaw Avenue

Control Type:	Two-way stop	Delay (sec / veh):	24.3
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.046

Intersection Setup

Name	SR 12		SR 12		Shaw Avenue	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	45.00		45.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	SR 12		SR 12		Shaw Avenue	
Base Volume Input [veh/h]	0	620	584	0	9	16
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	620	584	0	9	16
Peak Hour Factor	0.9800	0.9800	0.9800	0.9800	0.9800	0.9800
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	158	149	0	2	4
Total Analysis Volume [veh/h]	0	633	596	0	9	16
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.01	0.01	0.00	0.05	0.03
d_M, Delay for Movement [s/veh]	8.67	0.00	0.00	0.00	24.27	13.09
Movement LOS	A	A	A	A	C	B
95th-Percentile Queue Length [veh]	0.00	0.00	0.00	0.00	0.25	0.25
95th-Percentile Queue Length [ft]	0.00	0.00	0.00	0.00	6.27	6.27
d_A, Approach Delay [s/veh]	0.00		0.00		17.11	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]			0.34			
Intersection LOS			C			

Intersection Level Of Service Report
Intersection 2: SR 12 and Maple Avenue

Control Type:	Two-way stop	Delay (sec / veh):	24.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.000

Intersection Setup

Name	SR 12		SR 12		Maple Avenue	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration	┌		└		┐	
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	45.00		45.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	SR 12		SR 12		Maple Avenue	
Base Volume Input [veh/h]	9	620	580	14	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	9	620	580	14	0	0
Peak Hour Factor	0.9800	0.9800	0.9800	0.9800	0.9800	0.9800
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	158	148	4	0	0
Total Analysis Volume [veh/h]	9	633	592	14	0	0
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0




Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.01	0.01	0.00	0.00	0.00
d_M, Delay for Movement [s/veh]	8.74	0.00	0.00	0.00	24.15	12.18
Movement LOS	A	A	A	A	C	B
95th-Percentile Queue Length [veh]	5.18	5.18	0.00	0.00	0.00	0.00
95th-Percentile Queue Length [ft]	129.59	129.59	0.00	0.00	0.00	0.00
d_A, Approach Delay [s/veh]	0.12		0.00		18.16	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	0.06					
Intersection LOS	C					

Intersection Level Of Service Report
Intersection 1: SR 12 and Shaw Avenue

Control Type:	Two-way stop	Delay (sec / veh):	43.5
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.089

Intersection Setup

Name	SR 12		SR 12		Shaw Avenue	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	45.00		45.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	SR 12		SR 12		Shaw Avenue	
Base Volume Input [veh/h]	1	806	754	2	8	8
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1	806	754	2	8	8
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	219	205	1	2	2
Total Analysis Volume [veh/h]	1	876	820	2	9	9
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0




Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.01	0.01	0.00	0.09	0.02
d_M, Delay for Movement [s/veh]	9.46	0.00	0.00	0.00	43.46	17.48
Movement LOS	A	A	A	A	E	C
95th-Percentile Queue Length [veh]	22.99	22.99	0.00	0.00	0.37	0.37
95th-Percentile Queue Length [ft]	574.85	574.85	0.00	0.00	9.36	9.36
d_A, Approach Delay [s/veh]	0.01		0.00		30.47	
Approach LOS	F		A		D	
d_I, Intersection Delay [s/veh]	0.32					
Intersection LOS	E					

Intersection Level Of Service Report
Intersection 2: SR 12 and Maple Avenue

Control Type:	Two-way stop	Delay (sec / veh):	38.7
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.000

Intersection Setup

Name	SR 12		SR 12		Maple Avenue	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	45.00		45.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	SR 12		SR 12		Maple Avenue	
Base Volume Input [veh/h]	1	806	750	2	0	3
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1	806	750	2	0	3
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	214	199	1	0	1
Total Analysis Volume [veh/h]	1	857	798	2	0	3
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0




Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.01	0.01	0.00	0.00	0.01
d_M, Delay for Movement [s/veh]	9.38	0.00	0.00	0.00	38.65	14.41
Movement LOS	A	A	A	A	E	B
95th-Percentile Queue Length [veh]	20.26	20.26	0.00	0.00	0.02	0.02
95th-Percentile Queue Length [ft]	506.57	506.57	0.00	0.00	0.59	0.59
d_A, Approach Delay [s/veh]	0.01		0.00		14.41	
Approach LOS	F		A		B	
d_I, Intersection Delay [s/veh]	0.03					
Intersection LOS	E					

Intersection Level Of Service Report
Intersection 1: SR 12 and Shaw Avenue

Control Type:	Two-way stop	Delay (sec / veh):	39.4
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.072

Intersection Setup

Name	SR 12		SR 12		Shaw Avenue	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	45.00		45.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	SR 12		SR 12		Shaw Avenue	
Base Volume Input [veh/h]	1	877	750	0	8	4
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1	877	750	0	8	4
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	219	188	0	2	1
Total Analysis Volume [veh/h]	1	877	750	0	8	4
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings




Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.01	0.01	0.00	0.07	0.01
d_M, Delay for Movement [s/veh]	9.20	0.00	0.00	0.00	39.37	15.90
Movement LOS	A	A	A	A	E	C
95th-Percentile Queue Length [veh/ln]	0.00	0.00	0.00	0.00	0.26	0.26
95th-Percentile Queue Length [ft/ln]	0.09	0.09	0.00	0.00	6.54	6.54
d_A, Approach Delay [s/veh]	0.01		0.00		31.55	
Approach LOS	A		A		D	
d_I, Intersection Delay [s/veh]	0.24					
Intersection LOS	E					

Intersection Level Of Service Report					
Intersection 2: SR 12 and Maple Avenue					
Control Type:	Two-way stop	Delay (sec / veh):	43.7		
Analysis Method:	HCM 6th Edition	Level Of Service:	E		
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.080		

Intersection Setup

Name	SR 12		SR 12		Maple Avenue	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	45.00		45.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	SR 12		SR 12		Maple Avenue	
Base Volume Input [veh/h]	5	863	760	6	8	12
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	863	760	6	8	12
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	225	198	2	2	3
Total Analysis Volume [veh/h]	5	899	792	6	8	13
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0




Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.01	0.01	0.00	0.08	0.03
d_M, Delay for Movement [s/veh]	9.39	0.00	0.00	0.00	43.71	16.79
Movement LOS	A	A	A	A	E	C
95th-Percentile Queue Length [veh/ln]	0.02	0.02	0.00	0.00	0.38	0.38
95th-Percentile Queue Length [ft/ln]	0.46	0.46	0.00	0.00	9.47	9.47
d_A, Approach Delay [s/veh]	0.05		0.00		27.04	
Approach LOS	A		A		D	
d_I, Intersection Delay [s/veh]	0.36					
Intersection LOS	E					

Intersection Level Of Service Report
Intersection 1: SR 12 and Shaw Avenue

Control Type:	Two-way stop	Delay (sec / veh):	31.7
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.095

Intersection Setup

Name	SR 12		SR 12		Shaw Avenue	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	45.00		45.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	SR 12		SR 12		Shaw Avenue	
Base Volume Input [veh/h]	4	747	641	3	14	24
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	747	641	3	14	24
Peak Hour Factor	0.9800	0.9800	0.9800	0.9800	0.9800	0.9800
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	191	164	1	4	6
Total Analysis Volume [veh/h]	4	762	654	3	14	24
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0




Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.01	0.01	0.00	0.09	0.05
d_M, Delay for Movement [s/veh]	8.89	0.00	0.00	0.00	31.65	15.08
Movement LOS	A	A	A	A	D	C
95th-Percentile Queue Length [veh]	9.54	9.54	0.00	0.00	0.50	0.50
95th-Percentile Queue Length [ft]	238.52	238.52	0.00	0.00	12.60	12.60
d_A, Approach Delay [s/veh]	0.05		0.00		21.19	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	0.58					
Intersection LOS	D					

Intersection Level Of Service Report
Intersection 2: SR 12 and Maple Avenue

Control Type:	Two-way stop	Delay (sec / veh):	30.6
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.014

Intersection Setup

Name	SR 12		SR 12		Maple Avenue	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	45.00		45.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	SR 12		SR 12		Maple Avenue	
Base Volume Input [veh/h]	10	751	637	16	2	5
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	10	751	637	16	2	5
Peak Hour Factor	0.9800	0.9800	0.9800	0.9800	0.9800	0.9800
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	192	163	4	1	1
Total Analysis Volume [veh/h]	10	766	650	16	2	5
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0




Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.01	0.01	0.00	0.01	0.01
d_M, Delay for Movement [s/veh]	8.94	0.00	0.00	0.00	30.56	13.08
Movement LOS	A	A	A	A	D	B
95th-Percentile Queue Length [veh]	10.18	10.18	0.00	0.00	0.08	0.08
95th-Percentile Queue Length [ft]	254.39	254.39	0.00	0.00	1.90	1.90
d_A, Approach Delay [s/veh]	0.12		0.00		18.07	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	0.15					
Intersection LOS	D					

Intersection Level Of Service Report
Intersection 1: SR 12 and Shaw Avenue

Control Type:	Two-way stop	Delay (sec / veh):	33.6
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.060

Intersection Setup

Name	SR 12		SR 12		Shaw Avenue	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	45.00		45.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	SR 12		SR 12		Shaw Avenue	
Base Volume Input [veh/h]	6	671	687	12	7	6
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	6	671	687	12	7	6
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	182	187	3	2	2
Total Analysis Volume [veh/h]	7	729	747	13	8	7
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0




Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.01	0.01	0.00	0.06	0.02
d_M, Delay for Movement [s/veh]	9.26	0.00	0.00	0.00	33.57	15.34
Movement LOS	A	A	A	A	D	C
95th-Percentile Queue Length [veh]	10.89	10.89	0.00	0.00	0.25	0.25
95th-Percentile Queue Length [ft]	272.13	272.13	0.00	0.00	6.20	6.20
d_A, Approach Delay [s/veh]	0.09		0.00		25.06	
Approach LOS	A		A		D	
d_I, Intersection Delay [s/veh]	0.29					
Intersection LOS	D					

Intersection Level Of Service Report
Intersection 2: SR 12 and Maple Avenue

Control Type:	Two-way stop	Delay (sec / veh):	30.2
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.007

Intersection Setup

Name	SR 12		SR 12		Maple Avenue	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	45.00		45.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	SR 12		SR 12		Maple Avenue	
Base Volume Input [veh/h]	1	675	684	2	1	4
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1	675	684	2	1	4
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	180	182	1	0	1
Total Analysis Volume [veh/h]	1	718	728	2	1	4
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings




Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.01	0.01	0.00	0.01	0.01
d_M, Delay for Movement [s/veh]	9.12	0.00	0.00	0.00	30.18	13.71
Movement LOS	A	A	A	A	D	B
95th-Percentile Queue Length [veh]	9.38	9.38	0.00	0.00	0.05	0.05
95th-Percentile Queue Length [ft]	234.42	234.42	0.00	0.00	1.25	1.25
d_A, Approach Delay [s/veh]	0.01		0.00		17.00	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	0.06					
Intersection LOS	D					

Intersection Level Of Service Report			
Intersection 1: SR 12 and Shaw Avenue			
Control Type:	Two-way stop	Delay (sec / veh):	32.6
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.098

Intersection Setup

Name	SR 12		SR 12		Shaw Avenue	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	45.00		45.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	SR 12		SR 12		Shaw Avenue	
Base Volume Input [veh/h]	8	731	683	1	14	9
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	8	731	683	1	14	9
Peak Hour Factor	0.9900	0.9900	0.9900	0.9900	0.9900	0.9900
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	185	172	0	4	2
Total Analysis Volume [veh/h]	8	738	690	1	14	9
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0




Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.01	0.01	0.00	0.10	0.02
d_M, Delay for Movement [s/veh]	9.02	0.00	0.00	0.00	32.61	15.55
Movement LOS	A	A	A	A	D	C
95th-Percentile Queue Length [veh]	9.55	9.55	0.00	0.00	0.39	0.39
95th-Percentile Queue Length [ft]	238.87	238.87	0.00	0.00	9.86	9.86
d_A, Approach Delay [s/veh]	0.10		0.00		25.93	
Approach LOS	A		A		D	
d_I, Intersection Delay [s/veh]				0.46		
Intersection LOS				D		

Intersection Level Of Service Report
Intersection 2: SR 12 and Maple Avenue

Control Type:	Two-way stop	Delay (sec / veh):	33.1
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.052

Intersection Setup

Name	SR 12		SR 12		Maple Avenue	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	45.00		45.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	SR 12		SR 12		Maple Avenue	
Base Volume Input [veh/h]	4	724	700	5	7	10
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	4	724	700	5	7	10
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	189	182	1	2	3
Total Analysis Volume [veh/h]	4	754	729	5	7	10
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0




Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.01	0.01	0.00	0.05	0.02
d_M, Delay for Movement [s/veh]	9.15	0.00	0.00	0.00	33.07	14.85
Movement LOS	A	A	A	A	D	B
95th-Percentile Queue Length [veh]	11.22	11.22	0.00	0.00	0.24	0.24
95th-Percentile Queue Length [ft]	280.40	280.40	0.00	0.00	6.09	6.09
d_A, Approach Delay [s/veh]	0.05		0.00		22.35	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]			0.28			
Intersection LOS			D			

Intersection Level Of Service Report
Intersection 1: SR 12 and Shaw Avenue

Control Type:	Two-way stop	Delay (sec / veh):	27.4
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.064

Intersection Setup

Name	SR 12		SR 12		Shaw Avenue	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	45.00		45.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	SR 12		SR 12		Shaw Avenue	
Base Volume Input [veh/h]	25	625	584	21	11	17
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	25	625	584	21	11	17
Peak Hour Factor	0.9800	0.9800	0.9800	0.9800	0.9800	0.9800
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	6	159	149	5	3	4
Total Analysis Volume [veh/h]	26	638	596	21	11	17
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0




Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.01	0.01	0.00	0.06	0.03
d_M, Delay for Movement [s/veh]	8.84	0.00	0.00	0.00	27.39	13.63
Movement LOS	A	A	A	A	D	B
95th-Percentile Queue Length [veh]	5.77	5.77	0.00	0.00	0.32	0.32
95th-Percentile Queue Length [ft]	144.29	144.29	0.00	0.00	8.11	8.11
d_A, Approach Delay [s/veh]	0.35		0.00		19.03	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]			0.58			
Intersection LOS			D			

Intersection Level Of Service Report
Intersection 2: SR 12 and Maple Avenue

Control Type:	Two-way stop	Delay (sec / veh):	25.4
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.028

Intersection Setup

Name	SR 12		SR 12		Maple Avenue	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	45.00		45.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	SR 12		SR 12		Maple Avenue	
Base Volume Input [veh/h]	9	645	581	14	5	10
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	9	645	581	14	5	10
Peak Hour Factor	0.9800	0.9800	0.9800	0.9800	0.9800	0.9800
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	165	148	4	1	3
Total Analysis Volume [veh/h]	9	658	593	14	5	10
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0




Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.01	0.01	0.00	0.03	0.02
d_M, Delay for Movement [s/veh]	8.74	0.00	0.00	0.00	25.43	12.76
Movement LOS	A	A	A	A	D	B
95th-Percentile Queue Length [veh]	5.72	5.72	0.00	0.00	0.15	0.15
95th-Percentile Queue Length [ft]	142.94	142.94	0.00	0.00	3.73	3.73
d_A, Approach Delay [s/veh]	0.12		0.00		16.98	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]	0.26					
Intersection LOS	D					

Intersection Level Of Service Report
Intersection 1: SR 12 and Shaw Avenue

Control Type:	Two-way stop	Delay (sec / veh):	46.3
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.114

Intersection Setup

Name	SR 12		SR 12		Shaw Avenue	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	45.00		45.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	SR 12		SR 12		Shaw Avenue	
Base Volume Input [veh/h]	6	671	687	12	7	6
Base Volume Adjustment Factor	1.1430	1.2030	1.0980	1.1430	1.4770	1.4770
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	7	807	754	14	10	9
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	219	205	4	3	2
Total Analysis Volume [veh/h]	8	877	820	15	11	10
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0




Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.01	0.01	0.00	0.11	0.03
d_M, Delay for Movement [s/veh]	9.55	0.00	0.00	0.00	46.28	18.63
Movement LOS	A	A	A	A	E	C
95th-Percentile Queue Length [veh]	24.41	24.41	0.00	0.00	0.48	0.48
95th-Percentile Queue Length [ft]	610.29	610.29	0.00	0.00	11.96	11.96
d_A, Approach Delay [s/veh]	0.09		0.00		33.11	
Approach LOS	F		A		D	
d_I, Intersection Delay [s/veh]	0.44					
Intersection LOS	E					

Intersection Level Of Service Report
Intersection 2: SR 12 and Maple Avenue

Control Type:	Two-way stop	Delay (sec / veh):	39.3
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.009

Intersection Setup

Name	SR 12		SR 12		Maple Avenue	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	45.00		45.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	SR 12		SR 12		Maple Avenue	
Base Volume Input [veh/h]	1	675	684	2	1	4
Base Volume Adjustment Factor	1.1430	1.2030	1.0980	1.1430	1.4770	1.4770
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	1	812	751	2	1	6
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	216	200	1	0	2
Total Analysis Volume [veh/h]	1	864	799	2	1	6
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings




Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.00	0.01	0.01	0.00	0.01	0.02
d_M, Delay for Movement [s/veh]	9.38	0.00	0.00	0.00	39.30	14.68
Movement LOS	A	A	A	A	E	B
95th-Percentile Queue Length [veh]	20.88	20.88	0.00	0.00	0.08	0.08
95th-Percentile Queue Length [ft]	522.04	522.04	0.00	0.00	1.92	1.92
d_A, Approach Delay [s/veh]	0.01		0.00		18.20	
Approach LOS	F		A		C	
d_I, Intersection Delay [s/veh]	0.08					
Intersection LOS	E					

Intersection Level Of Service Report					
Intersection 1: SR 12 and Shaw Avenue					
Control Type:	Two-way stop	Delay (sec / veh):	43.7		
Analysis Method:	HCM 6th Edition	Level Of Service:	E		
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.197		

Intersection Setup

Name	SR 12		SR 12		Shaw Avenue	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	45.00		45.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	SR 12		SR 12		Shaw Avenue	
Base Volume Input [veh/h]	8	731	683	1	14	9
Base Volume Adjustment Factor	1.1430	1.2030	1.0980	1.1430	1.4770	1.4770
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	9	879	750	1	21	13
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	2	220	188	0	5	3
Total Analysis Volume [veh/h]	9	879	750	1	21	13
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings




Priority Scheme	Free	Free	Stop
Flared Lane			Yes
Storage Area [veh]	0	0	5
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.01	0.01	0.00	0.20	0.03
d_M, Delay for Movement [s/veh]	9.24	0.00	0.00	0.00	43.72	18.78
Movement LOS	A	A	A	A	E	C
95th-Percentile Queue Length [veh/ln]	0.03	0.03	0.00	0.00	0.71	0.71
95th-Percentile Queue Length [ft/ln]	0.79	0.79	0.00	0.00	17.63	17.63
d_A, Approach Delay [s/veh]	0.09		0.00		34.18	
Approach LOS	A		A		D	
d_I, Intersection Delay [s/veh]			0.74			
Intersection LOS			E			

Intersection Level Of Service Report					
Intersection 2: SR 12 and Maple Avenue					
Control Type:	Two-way stop	Delay (sec / veh):	45.5		
Analysis Method:	HCM 6th Edition	Level Of Service:	E		
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.103		

Intersection Setup

Name	SR 12		SR 12		Maple Avenue	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	45.00		45.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	SR 12		SR 12		Maple Avenue	
Base Volume Input [veh/h]	4	724	700	5	7	10
Base Volume Adjustment Factor	1.1430	1.2030	1.0980	1.1430	1.4770	1.4770
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	5	871	769	6	10	15
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	1	227	200	2	3	4
Total Analysis Volume [veh/h]	5	907	801	6	10	16
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0




Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.01	0.01	0.00	0.10	0.04
d_M, Delay for Movement [s/veh]	9.43	0.00	0.00	0.00	45.47	17.77
Movement LOS	A	A	A	A	E	C
95th-Percentile Queue Length [veh/ln]	0.02	0.02	0.00	0.00	0.50	0.50
95th-Percentile Queue Length [ft/ln]	0.46	0.46	0.00	0.00	12.38	12.38
d_A, Approach Delay [s/veh]	0.05		0.00		28.42	
Approach LOS	A		A		D	
d_I, Intersection Delay [s/veh]				0.45		
Intersection LOS				E		

Intersection Level Of Service Report
Intersection 1: SR 12 and Shaw Avenue

Control Type:	Two-way stop	Delay (sec / veh):	36.6
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.125

Intersection Setup

Name	SR 12		SR 12		Shaw Avenue	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	45.00		45.00		25.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	SR 12		SR 12		Shaw Avenue	
Base Volume Input [veh/h]	25	625	584	21	11	17
Base Volume Adjustment Factor	1.1430	1.2030	1.0980	1.1430	1.4770	1.4770
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	29	752	641	24	16	25
Peak Hour Factor	0.9800	0.9800	0.9800	0.9800	0.9800	0.9800
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	192	164	6	4	6
Total Analysis Volume [veh/h]	30	767	654	24	16	26
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0




Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.03	0.01	0.01	0.00	0.13	0.06
d_M, Delay for Movement [s/veh]	9.07	0.00	0.00	0.00	36.56	16.26
Movement LOS	A	A	A	A	E	C
95th-Percentile Queue Length [veh]	11.46	11.46	0.00	0.00	0.65	0.65
95th-Percentile Queue Length [ft]	286.53	286.53	0.00	0.00	16.20	16.20
d_A, Approach Delay [s/veh]	0.34		0.00		23.99	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]			0.84			
Intersection LOS			E			

Intersection Level Of Service Report
Intersection 2: SR 12 and Maple Avenue

Control Type:	Two-way stop	Delay (sec / veh):	32.5
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.051

Intersection Setup

Name	SR 12		SR 12		Maple Avenue	
Approach	Northbound		Southbound		Eastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	45.00		45.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	No		No		No	

Volumes

Name	SR 12		SR 12		Maple Avenue	
Base Volume Input [veh/h]	9	645	581	14	5	10
Base Volume Adjustment Factor	1.1430	1.2030	1.0980	1.1430	1.4770	1.4770
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	10	776	638	16	7	15
Peak Hour Factor	0.9800	0.9800	0.9800	0.9800	0.9800	0.9800
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	198	163	4	2	4
Total Analysis Volume [veh/h]	10	792	651	16	7	15
Pedestrian Volume [ped/h]	0		0		0	

Intersection Settings

Priority Scheme	Free	Free	Stop
Flared Lane			No
Storage Area [veh]	0	0	0
Two-Stage Gap Acceptance			No
Number of Storage Spaces in Median	0	0	0

Movement, Approach, & Intersection Results

V/C, Movement V/C Ratio	0.01	0.01	0.01	0.00	0.05	0.03
d_M, Delay for Movement [s/veh]	8.94	0.00	0.00	0.00	32.46	14.00
Movement LOS	A	A	A	A	D	B
95th-Percentile Queue Length [veh]	11.37	11.37	0.00	0.00	0.27	0.27
95th-Percentile Queue Length [ft]	284.31	284.31	0.00	0.00	6.76	6.76
d_A, Approach Delay [s/veh]	0.11		0.00		19.87	
Approach LOS	A		A		C	
d_I, Intersection Delay [s/veh]			0.35			
Intersection LOS			D			

Appendix D

Pedestrian Facilities and Highway 12 Left-turn Lane Concept Drawings



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ABBREVIATIONS

AC ASPHALT CONCRETE
 APN ASSessor's PARCEL NUMBER
 DRY DRAINAGE
 EX EXISTING UNBUILT
 EP EDGE OF PAVEMENT
 LR LINE OF ROAD
 FT FOOT
 HW CALTRANS HIGHWAY DESIGN MANUAL
 HWY HIGHWAY
 IS 12" DEAM
 EX EXISTING
 M/M MILEAGE
 MPM MILE PER HOUR
 MS MOUNTAIN
 PUE PUBLIC UTILITY ENCUMBRANCE
 ROW RIGHT OF WAY
 S/S SOUTHERN
 TYP TYPICAL
 UB UTILITY BOX

SYMBOLS & LEGEND

EXISTING PROPOSED

UTILITY POLE
 WATER BASED
 TREE
 APPROXIMATE ASSessor's PARCEL LINE
 OVERHEAD UTILITY LINE
 CONCRETE
 PAVEMENT
 EXTENT OF REQUIRED ROW

DESIGN INPUTS

DESIGN CATEGORY.....CONVENTIONAL HIGHWAY-URBAN ARTERIAL-THROUGHWAY
 PORTED SPEED ADVISORY.....45 MPH
 AVERAGE DAILY TRAFFIC.....18,000 VEHICLES PER DAY (TRAFFIC IMPACT STUDY DRAFT REPORT BY W-TM&S, FEBRUARY 1, 2018)
 STOPPING SIGHT DISTANCE.....400'
 CORNER SIGHT DISTANCE.....400'
 DESIGN VEHICLE.....S18A

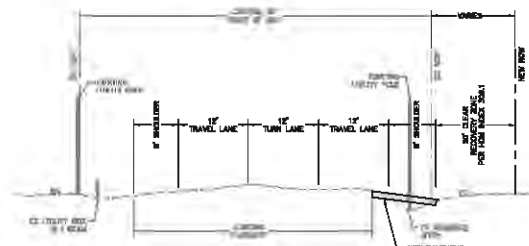
PROPOSED EXHIBIT

W&B ENGINEERS HAS RETAINED TO EVALUATE THE FEASIBILITY OF PROVIDING A DEDICATED LEFT-TURN LANE FROM HIGHWAY 12 TO SHAW AVE. WE DETERMINED THAT THIS TURN LANE COULD NOT BE BUILT WITHIN THE EXISTING RIGHT OF WAY WHILE CONFORMING TO THE REQUIREMENTS OF THE CALTRANS HIGHWAY DESIGN MANUAL AND RETAINED STATIONING. THIS CONCEPTUAL EXHIBIT HAS BEEN PREPARED AT THE REQUEST OF SONOMA COUNTY TO SHOW A LEFT-TURN LANE AND THE EXTENT OF THE REQUIRED RIGHT OF WAY DEDICATION.

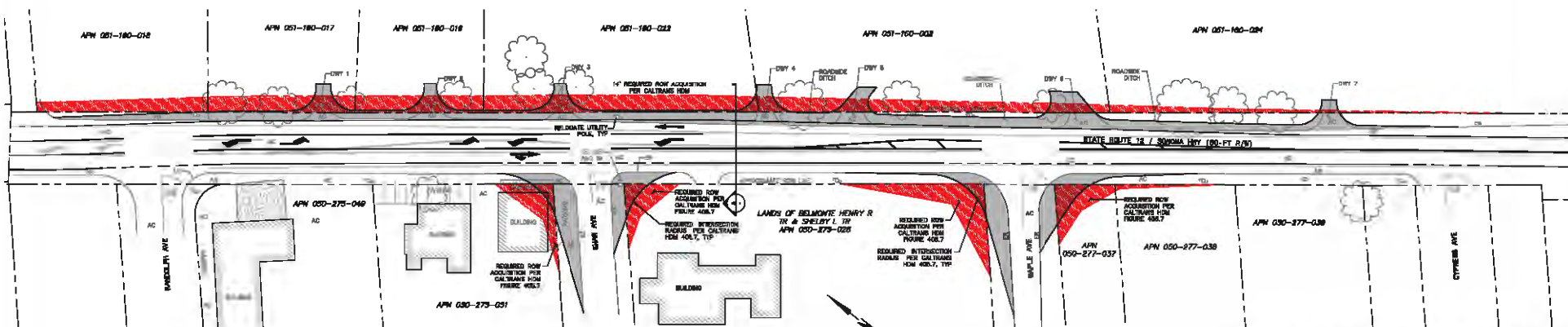


VICINITY MAP

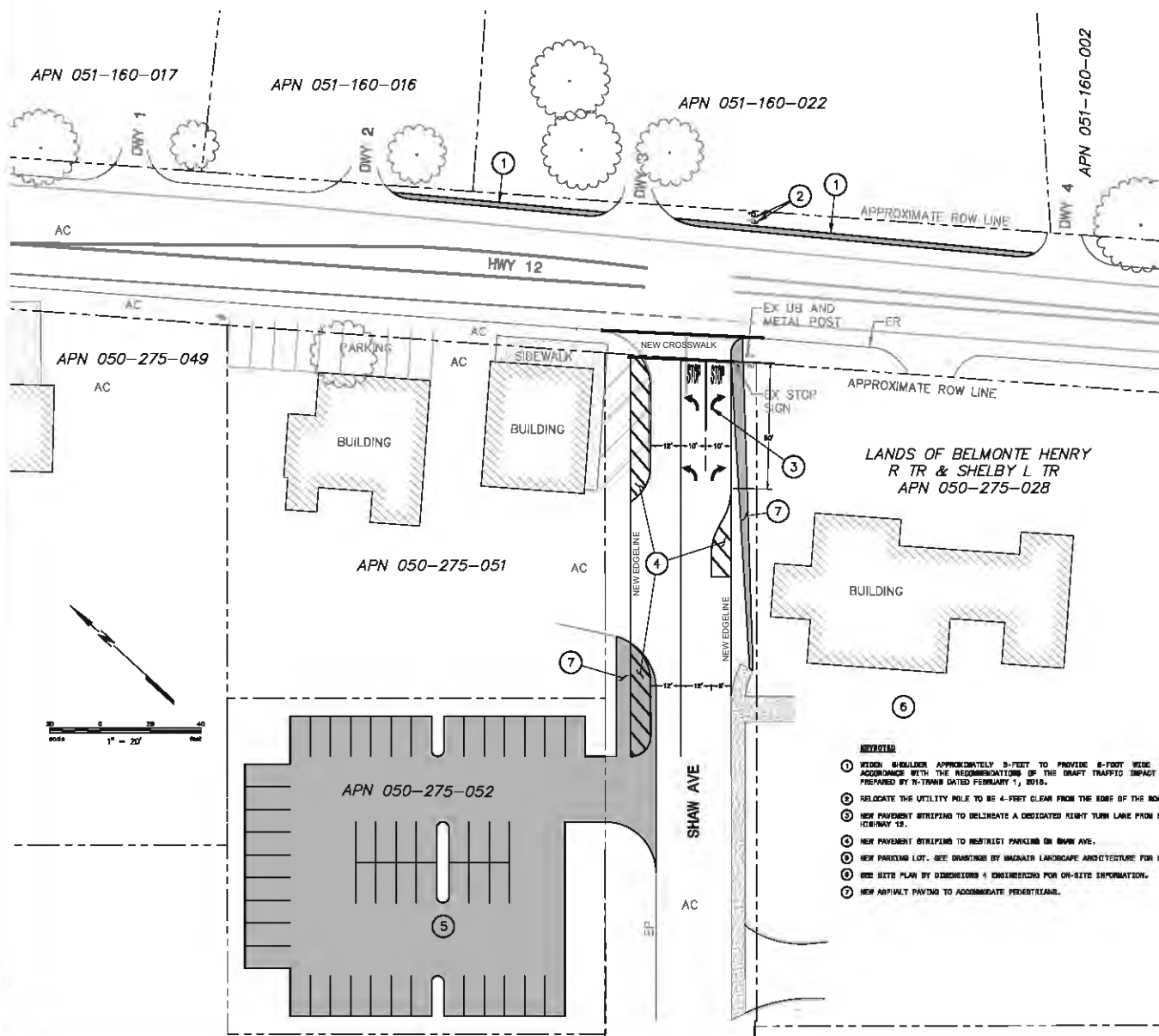
NOT TO SCALE



SECTION "A"
 NO SCALE



NOTES:
EXISTING FEATURES SHOWN HEREIN WERE OBTAINED FROM CALTRANS RECORD
DRAWINGS AND KENWOOD COUNTY GIS DATA AND ARE APPROXIMATE. THIS IS A
CONCEPTUAL EXHIBIT FOR PLANNING PURPOSES ONLY.



VICINITY MAP
NOT TO SCALE

ABBREVIATIONS
AC ASPHALT CONCRETE
APN ASSessor'S PARCEL NUMBER
DLY DELIVERY
ES EXISTING SIDEWALK
EP EDGE OF PAVEMENT
ER EDGE OF ROAD
FT FOOT
HDM CALTRANS HIGHWAY DESIGN MANUAL
HDM HIGHWAY
IS 12" BEAM
EX EXISTING
NEW NEW
MPS MILE PER HOUR
NS NORTHBOUND
PUE PUBLIC UTILITY EASEMENT
ROW RIGHT OF WAY
SB SOUTHBOUND
TYP TYPICAL
UB UTILITY BOX

SYMBOLS & LEGEND	
EXISTING	PROPOSED

PARKING LOT, SHAW AVENUE TURN LANE & HWY 12 SHOULDER WIDENING CONCEPTUAL EXHIBIT

VJB WINERY
801012025 / 801012-26.06-26.75
88 SHAW AVE, KENWOOD, CA (APN 050-275-001)

JULY 2019

PREPARED BY



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SHEET 1 OF 1 SHEETS