March 1, 2018

Mr. John Caldwell
Caldwell Vineyards
169 Kreuzer Lane
Napa, CA 94558

Focused Traffic Analysis for the Caldwell Vineyards Project

Dear Mr. Caldwell;

As requested, W-Trans has prepared a traffic analysis relative to an existing winery located at 270 Kreuzer Lane in the County of Napa with a proposed increase in tasting room visitation and agriculture promotional events. The purpose of this letter is to address potential traffic impacts associated with the increase in visitation and events. The traffic analysis was completed in accordance with the criteria established by the County of Napa, and is consistent with standard traffic engineering techniques.

Project Description

The project site currently has a Use Permit to produce 25,000 gallons of wine per year, have up to eight guests per day for appointment-only wine tasting, and hold various promotional events for up to 60 guests. The proposed modification of the Use Permit would allow an increase in production of up to 35,000 gallons of wine annually, including custom crush activity, wine-tasting for up to 60 guests per day, and promotional events for up to 200 guests. The site is located on Kreuzer Lane and may be accessed via Imola Avenue and Fourth Avenue from the west or Coombsville Road and Fourth Avenue from the north.

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 of reported collisions 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. It is noted that property-damage collisions are often not reported, so would not show up in either the records reviewed for this analysis or in the average collision rates used for comparative purposes.

The calculated collision rate for the study intersection of Kreuzer Lane/Fourth Avenue was compared to the average collision rate for similar facilities statewide, as indicated in *2012 Collision Data on California State Highways*, California Department of Transportation. The study intersection experienced two collisions over the five-year study period, which translates to a rate of 0.55 collisions per million vehicle miles (c/mvm). While this is higher than the statewide average of 0.16 c/mvm for similar facilities, given the very low volume it takes only one collision to exceed the statewide rate, and two incidents in five years would not reasonably represent a safety concern. In fact, given the non-standard controls at this location, the lack of more than two collisions in five years indicates that drivers are able to understand and travel through the intersection without difficulty. It is further noted that the recorded collisions did not result in any injuries; therefore, the above-average collision rate does not translate to a safety concern. The collision rate calculation is enclosed.

Existing Conditions

The study area consists of the project site, Kreuzer Lane from the project driveway to Fourth Avenue, Fourth Avenue north of Kreuzer Lane, and Fourth Avenue west of Kreuzer Lane. The project site is located at the end of a 0.2-mile driveway that extends from the east end of Kreuzer Lane. Kreuzer Lane is not classified in the Napa County Road Classification section of the General Plan, so it would be considered a local road. It generally runs east-west in the study area, has a width of 24 feet, and is generally straight and flat throughout the study segment. There is no posted speed limit on Kreuzer Lane, so a design speed of 25 miles per hour (mph) was assumed because of the width, volume, and use of the road. Fourth Avenue is a rural two-lane undivided road that generally runs north-south with a 12-foot travel lane in each direction. There is a posted speed limit of 40 mph on Fourth Avenue and the roadway is generally straight with rolling terrain. Based on counts collected in February 2018, the average weekday daily traffic (ADT) on Kreuzer 1Lane east of Fourth Avenue is about 400 vehicles per day, the ADT on Fourth Avenue west of Kreuzer Lane is approximately 1,900 vehicles per day, and the ADT on Fourth Avenue north of Kreuzer Lane is about 1,800 daily vehicles. The segment counts are enclosed.

Trip Generation

The Napa County Winery Traffic Information/Trip Generation Form was used to determine the potential trip generation for currently existing and proposed conditions. The form estimates the number of daily and peak hour trips for weekdays and Saturdays based on the number of full- and part-time employees, average daily visitors, and production. Based on the current Use Permit parameters, the site is permitted for 6 trips during the weekday p.m. peak hour and 8 trips during the weekend midday peak hour. The proposed changes to the Use Permit would be expected to result in a total of 29 trips during the weekday p.m. peak hour and 29 trips during the weekend midday peak hour, or an increase of 23 and 21 trips during the two peaks, respectively, over existing conditions.

The County's form does not include guidance on inbound versus outbound trips or peak hour trips for the weekday a.m. peak, so based on extensive data collected at a tasting facility in Sonoma County, it was assumed that two-thirds of trips at the winery would be outbound during the weekday p.m. peak hour as employees and customers leave at closure of the winery; for the weekend midday peak hour it was assumed that inbound and outbound trips would be evenly split. It was also assumed that 100 percent of the trip ends at the winery would be inbound during the weekday a.m. peak hour and that, of these trips, none would be winery visitors, since the trips would be associated with employees arriving at the winery. The results based on application of these assumptions are shown in Table 1. The Winery Traffic Information/ Trip Generation Forms for both permitted and proposed conditions are attached for reference.

Table 1 – Trip Generation Summary

Land Use	Weekday	Weekday AM Peak			Weekday PM Peak			Saturday Midday Peak		
	Trips	Trips	In	Out	Trips	In	Out	Trips	In	Out
Permitted	15	6	6	0	6	2	4	8	4	4
Proposed	76	11	11	0	29	10	19	29	15	14
Net New Trips	**61**	**5**	**5**	**0**	**23**	**8**	**15**	**21**	**11**	**10**

Traffic that would occur during a Crush Saturday was also tabulated, as shown in Table 2. The modified Use Permit would be expected to result in an average of 59 additional daily trips during a Crush Saturday including 34 trips during the peak hour; these trips represent the increase in traffic associated with the proposed use permit compared to currently existing conditions.

Table 2 – Trip Generation Summary – Crush Saturday

Condition	Daily	Saturday MD Peak Hour		
	Trips	Trips	In	Out
Existing	14	8	4	4
Proposed	73	42	21	21
Net New Trips	**59**	**34**	**17**	**17**

In addition to typical daily and crush Saturday operations, the anticipated trip generation for the largest proposed agriculture promotional event, one with 200 guests, was also estimated as shown in Table 3. Using the County's Winery Traffic Information/Trip Generation Form, a 200-person marketing event would be expected to generate a total of 159 trips, including 143 trips for guests, 12 trips for employees, and 4 trips for event trucks. For the purpose of estimating the peak hour trip generation it was assumed that all guests would be arriving at the site during the peak hour on either weekdays or weekend days. Event employees would arrive outside of the arrival and departure hours of the guests as they would be expected to be on-site for set-up and clean-up and are therefore not included in the peak hour totals. Similarly, the trucks associated with such events would be expected to arrive at and depart from the site outside hours or even days before and after the event.

Table 3 – Trip Generation for 200-Person Events

150-Person Event	Units	Total	PM Peak Hour			MD Peak Hour		
Trip Generator		Trips	Trips	In	Out	Trips	In	Out
Event Employees	6	12	0	0	0	0	0	0
Event Guests	200	143	72	72	0	72	72	0
Event Trucks	2	4	0	0	0	0	0	0
Total		**159**	**72**	**72**	**0**	**72**	**72**	**0**

Existing Volumes

Existing volumes are from counts taken on Kreuzer Lane between Fourth Avenue and the Project driveway, on Fourth Avenue west of Kreuzer Lane, and on Fourth Avenue north of Kreuzer Lane on February 15, 2018. All project-generated trips were assumed to arrive via the segment of Fourth Avenue west of Kreuzer Lane, which experiences the highest existing volumes, to arrive at the most conservative results. These volumes are summarized in Table 4.

Table 4 – Existing and Existing plus Project Segment Volumes

Study Segment	Existing Volumes			Existing plus Project		
	Daily	Weekday AM Peak	Weekday PM Peak	Daily	Weekday AM Peak	Weekday PM Peak
Kreuzer Lane	405	36	51	466	41	74
4th Avenue north of Kreuzer Lane	1775	197	185	1775	197	185
4th Avenue west of Kreuzer Lane	1872	198	195	1933	203	218

Two-Lane Highway Segment Level of Service Methodology

The roadway segment Level of Service methodology found in Chapter 15, "Two-Lane Highways," of the Highway Capacity Manual 6th Edition is the basis of the roadway LOS analysis. The methodology considers traffic volumes, terrain, roadway cross-section, the proportion of heavy vehicles, and the availability of passing zones. The LOS criteria for two-lane highways differs depending on whether the highway is considered "Class I," "Class II," or "Class III." Class I highways are typically long-distance routes connecting major traffic generators or national highway networks where motorists expect to travel at high speeds. Motorists do not necessarily expect to travel at high speeds on Class II highways, which often function as scenic or recreational routes and typically serve shorter trips. Class III highways may be portions of Class I or Class II highways that pass through towns and communities and have a mix of local traffic and through traffic. Fourth Avenue is considered a Class II highway.

Napa County Traffic Operation Standards

The County of Napa's adopted LOS Standard is contained in *Napa County General Plan Update 2008*. Policy CIR-16 states that the County shall seek to maintain an arterial Level of Service D or better on all county roadways.

Existing plus Project Conditions

The Existing plus Project condition during a typical weekday a.m. and p.m. peak period were analyzed. All project-generated trips were assigned to the segment experiencing the highest existing volumes, which is Fourth Avenue west of Kreuzer Lane, to arrive at "worst-case" results. Under existing volumes without project-generated traffic, the study roadways operate acceptably at LOS C or better in all directions. Upon the addition of project-generated traffic, the study roadways would be expected to continue operating at acceptable LOS C or better. These results for Existing and Existing plus Project scenarios are summarized in Table 5.

Table 5 – Existing and Existing plus Project Peak Hour Roadway Segment Levels of Service

Study Segment Direction	Existing Conditions				Existing plus Project			
	Weekday AM Peak		Weekday PM Peak		Weekday AM Peak		Weekday PM Peak	
	PTSF	LOS	PTSF	LOS	PTSF	LOS	PTSF	LOS
Fourth Avenue west of Kreuzer Lane								
EB – Penny Ln to Kreuzer Ln	39.9	A	38.5	A	42.3	B	39.7	A
WB – Kreuzer Ln to Penny Ln	57.3	C	50.8	B	57.2	C	53.1	B
Fourth Avenue north of Kreuzer Ln								
NB – Kreuzer Ln to Coombsville Rd	43.6	B	38.6	A	43.6	B	38.6	A
SB – Coombsville Rd to Kreuzer Ln	54.2	B	50.5	B	54.2	B	50.5	B

Notes: PTSF = Percent Time Spent Following; LOS = Level of Service

It is noted that there are no standard methodologies for evaluating low-speed two-lane roadways such as Kreuzer Lane east of Fourth Avenue, so the two-lane highway methodology was applied and it was found that the segment operates at LOS A under existing conditions; therefore, it is expected to continue operating acceptably with project-generated traffic.

All-Way Stop Control Warrants

An All-Way Stop Control (AWSC) warrant analysis was completed for the intersection of Kreuzer Lane/Fourth Avenue under Existing conditions based on the *California Manual of Uniform Traffic Control Devices* (CA-MUTCD) to determine if AWSC are already warranted or project-related traffic would trigger the need for added controls. The CA-MUTCD identifies five categories of criteria for determining if an intersection should be considered a candidate for AWSC, including the necessity for traffic signal controls, various traffic volume levels on approaching streets, intersection collision records, a combination of these warrants, and several optional warrants.

The four optional criteria for AWSC warrants listed in the CA-MUTCD include: (A) the potential for left turn conflicts; (B) the potential for vehicle/pedestrian conflicts where there is a high volume of pedestrian activity; (C) restricted sight distance to the extent that turns at the intersection are difficult to complete; and (D) at the intersection of two residential neighborhood collector streets where AWSC would improve the overall operational characteristics of the intersection.

Traffic Volumes

AWSC are often used at the intersection of two roadways that exhibit approximately equal traffic volumes. In order to meet the volume warrant, the number of vehicles entering the intersection from the major street must exceed *300 vehicles for each of eight separate hours* plus the volume on the minor street must exceed *200 vehicles per hour for the same eight hours.*

This warrant criteria is not met based on the counts collected for existing conditions. For the purposes of adding project traffic to existing volumes, it was conservatively assumed that the 23 peak hour trips would be added to each of the eight highest hours. Upon adding project-related traffic to Existing volumes, neither approach on Fourth Avenue would meet the condition of having at least 300 vehicles enter the intersection for each of eight separate hours to qualify as the major street, nor does Kreuzer Lane or either approach of Fourth Avenue have at least 200 vehicles during those same eight hours to qualify as the minor street. Based on the existing volumes as well as those with project traffic added, AWSC are not warranted.

Collision Records

In order for AWSC to be warranted due to collisions, there would have to be five collisions reported during a period of 12 months that could be prevented by AWSC. At the intersection there was one collision reported for the most recent five-year period; therefore, the collision history does not trigger the need for all-way stop controls.

Optional Criteria

Optional criteria (A) was considered in evaluating the need for all-way stop control. Left-turning vehicles from the southbound Fourth Avenue approach can conflict with vehicles approaching from eastbound Fourth Avenue; however, based on the five-year collision history at the intersection, there have not been any collisions in the last five years of a type that are caused by this left-turn conflict.

Consideration was also given to optional criteria (C), which warrants all-way stop control at *locations where a road user, after stopping, cannot see conflicting traffic and is not able to reasonably safely negotiate the intersection unless conflicting cross traffic is also required to stop.* At the study intersection, the westbound Kreuzer Lane approach is stop-controlled. Based on aerial photography from Google Earth, sight distance at the intersection was evaluated. The applicable criterion for a public intersection as published by Caltrans in the *Highway Design Manual* is corner sight distance, and while a lower advisory speed is posted for the corner, a 25-mph design speed was assumed. For this approach speed, sight lines of 275 feet are needed. From Kreuzer Lane along eastbound Fourth Avenue oncoming vehicles can be seen from well in excess of this distance. Similarly, drivers have an unobstructed view

of vehicles approaching on southbound Fourth Avenue when they are more than 275 feet away. Sight distances at the intersection are therefore adequate, indicating that all-way stop controls are not warranted.

Conclusions and Recommendations

- The winery is expected to generate an average of 61 additional daily trips, including 5 new a.m. peak hour trip, 23 p.m. peak hour trips, and 21 Saturday midday peak hour trips.
- Under Existing plus Project conditions, the study segments of Fourth Avenue and Kreuzer Lane are expected to operate acceptably at LOS C or better.
- All-way stop controls are not warranted at the study intersection of Kreuzer Lane/Fourth Avenue.

Thank you for giving W-Trans the opportunity to provide these services. Please call if you have any questions.

Sincerely,

Kevin Rangel, EIT
Assistant Engineer

Dalene J. Whitlock, PE, PTOE
Principal

DJW/kr/NAX083.L1

Enclosures: Collision Rate Calculation
Segment Volumes
Trip Generation
Segment Level of Service Analyses

Intersection Collision Rate Calculations

Caldwell Vineyards

Intersection # 1: Kreuzer Lane & Fourth Avenue
Date of Count: Thursday, February 15, 2018

Number of Collisions: 2
Number of Injuries: 0
Number of Fatalities: 0
ADT: 2000
Start Date: January 1, 2012
End Date: December 31, 2016
Number of Years: 5

Intersection Type: Tee
Control Type: Stop & Yield Controls
Area: Rural

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

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

	Collision Rate	Fatality Rate	Injury Rate
Study Intersection	**0.55 c/mve**	**0.0%**	**0.0%**
Statewide Average*	**0.16 c/mve**	**1.7%**	**39.2%**

ADT = average daily total vehicles entering intersection
c/mve = collisions per million vehicles entering intersection
* 2013 Collision Data on California State Highways, Caltrans

Prepared by NDS/ATD

VOLUME

Fourth Ave N/O Kreuzer Ln

Day: Thursday
Date: 2/15/2018

City: Napa
Project #: CA18_8062_001

DAILY TOTALS	NB	SB	EB	WB	Total
	928	847	0	0	1,775

AM Period	NB		SB		EB		WB		TOTAL	
00:00	0		0						0	
00:15	2		0						2	
00:30	0		0						0	
00:45	0	2	0						0	2
01:00	0		0						0	
01:15	0		0						0	
01:30	0		0						0	
01:45	0		0						0	
02:00	1		2						3	
02:15	0		0						0	
02:30	1		1						2	
02:45	0	2	0	3					0	5
03:00	0		1						1	
03:15	0		0						0	
03:30	0		1						1	
03:45	0		1	3					1	3
04:00	1		1						2	
04:15	0		2						2	
04:30	1		2						3	
04:45	0	2	5	10					5	12
05:00	1		1						2	
05:15	2		5						7	
05:30	5		5						10	
05:45	4	12	8	19					12	31
06:00	8		7						15	
06:15	7		7						14	
06:30	22		9						31	
06:45	9	46	8	31					17	77
07:00	4		13						17	
07:15	18		13						31	
07:30	11		22						33	
07:45	22	55	26	74					48	129
08:00	32		33						65	
08:15	21		30						51	
08:30	9		22						31	
08:45	12	74	13	98					25	172
09:00	14		15						29	
09:15	10		9						19	
09:30	8		18						26	
09:45	11	43	8	50					19	93
10:00	10		12						22	
10:15	10		14						24	
10:30	13		19						32	
10:45	16	49	14	59					30	108
11:00	9		14						23	
11:15	15		13						28	
11:30	11		13						24	
11:45	20	55	14	54					34	109
TOTALS		340		401						741
SPLIT %		45.9%		54.1%						41.7%

PM Period	NB		SB		EB		WB		TOTAL	
12:00	22		12						34	
12:15	22		9						31	
12:30	17		8						25	
12:45	19	80	13	42					32	122
13:00	12		16						28	
13:15	14		16						30	
13:30	11		9						20	
13:45	15	52	9	50					24	102
14:00	24		16						40	
14:15	18		11						29	
14:30	18		10						28	
14:45	20	80	30	67					50	147
15:00	17		35						52	
15:15	25		18						43	
15:30	17		23						40	
15:45	13	72	16	92					29	164
16:00	23		8						31	
16:15	17		21						38	
16:30	23		18						41	
16:45	17	80	13	60					30	140
17:00	21		20						41	
17:15	16		17						33	
17:30	23		14						37	
17:45	17	77	11	62					28	139
18:00	19		14						33	
18:15	20		5						25	
18:30	12		8						20	
18:45	13	64	8	35					21	99
19:00	5		5						10	
19:15	3		3						6	
19:30	6		3						9	
19:45	8	22	1	12					9	34
20:00	2		6						8	
20:15	8		3						11	
20:30	5		2						7	
20:45	6	21	1	12					7	33
21:00	10		1						11	
21:15	2		1						3	
21:30	4		3						7	
21:45	5	21	4	9					9	30
22:00	3		1						4	
22:15	3		1						4	
22:30	0		0						0	
22:45	2	8	2	4					4	12
23:00	1		0						1	
23:15	4		0						4	
23:30	4		0						4	
23:45	2	11	1	1					3	12
TOTALS		588		446						1034
SPLIT %		56.9%		43.1%						58.3%

DAILY TOTALS	NB	SB	EB	WB	Total
	928	847	0	0	1,775

AM Peak Hour	07:30	07:30	07:30
AM Pk Volume	86	111	197
Pk Hr Factor	0.672	0.841	0.758
7 - 9 Volume	129	172	301
7 - 9 Peak Hour	07:30	07:30	07:30
7 - 9 Pk Volume	86	111	197
Pk Hr Factor	0.672	0.841	0.758

PM Peak Hour	12:00	14:45	14:45
PM Pk Volume	80	106	185
Pk Hr Factor	0.909	0.757	0.889
4 - 6 Volume	157	122	279
4 - 6 Peak Hour	16:00	16:15	16:15
4 - 6 Pk Volume	80	72	150
Pk Hr Factor	0.870	0.857	0.915

Prepared by NDS/ATD

VOLUME

Kreuzer Ln E/O Fourth Ave

Day: Thursday
Date: 2/15/2018

City: Napa
Project #: CA18_8062_002

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	206	199	405

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			0		0		0		12:00			5		2		7	
00:15			0		0		0		12:15			2		5		7	
00:30			0		0		0		12:30			4		3		7	
00:45			0		0		0		12:45			4	15	4	14	8	29
01:00			0		0		0		13:00			2		4		6	
01:15			0		0		0		13:15			1		2		3	
01:30			0		0		0		13:30			2		4		6	
01:45			0		0		0		13:45			2	7	5	15	7	22
02:00			0		0		0		14:00			1		3		4	
02:15			0		0		0		14:15			2		2		4	
02:30			1		1		2		14:30			1		4		5	
02:45			0	1	1	2	1	3	14:45			5	9	2	11	7	20
03:00			1		0		1		15:00			6		6		12	
03:15			0		0		0		15:15			5		3		8	
03:30			0		0		0		15:30			4		9		13	
03:45			0	1	0		0	1	15:45			5	20	2	20	7	40
04:00			0		0		0		16:00			6		5		11	
04:15			0		0		0		16:15			3		11		14	
04:30			0		0		0		16:30			1		15		16	
04:45			0		0		0		16:45			5	15	5	36	10	51
05:00			0		0		0		17:00			3		1		4	
05:15			0		0		0		17:15			2		3		5	
05:30			0		0		0		17:30			8		3		11	
05:45			2	2	0		2	2	17:45			3	16	4	11	7	27
06:00			3		3		6		18:00			4		1		5	
06:15			3		0		3		18:15			2		5		7	
06:30			12		1		13		18:30			3		2		5	
06:45			11	29	2	6	13	35	18:45			0	9	3	11	3	20
07:00			2		1		3		19:00			1		0		1	
07:15			3		1		4		19:15			2		1		3	
07:30			3		2		5		19:30			2		1		3	
07:45			2	10	7	11	9	21	19:45			0	5	0	2	0	7
08:00			2		7		9		20:00			2		1		3	
08:15			6		2		8		20:15			1		1		2	
08:30			2		6		8		20:30			1		0		1	
08:45			4	14	7	22	11	36	20:45			5	9	2	4	7	13
09:00			3		3		6		21:00			1		1		2	
09:15			2		2		4		21:15			1		1		2	
09:30			1		1		2		21:30			2		0		2	
09:45			2	8	1	7	3	15	21:45			0	4	1	3	1	7
10:00			3		2		5		22:00			0		0		0	
10:15			5		2		7		22:15			1		0		1	
10:30			2		4		6		22:30			0		0		0	
10:45			3	13	5	13	8	26	22:45			0	1	0		0	1
11:00			9		3		12		23:00			0		0		0	
11:15			1		3		4		23:15			0		0		0	
11:30			1		1		2		23:30			0		0		0	
11:45			7	18	4	11	11	29	23:45			0		0		0	
TOTALS				96		72		168	TOTALS				110		127		237
SPLIT %				57.1%		42.9%		41.5%	SPLIT %				46.4%		53.6%		58.5%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	206	199	405

AM Peak Hour	06:00	07:45	08:00	PM Peak Hour	14:45	16:00	16:00
AM Pk Volume	29	22	36	PM Pk Volume	20	36	51
Pk Hr Factor	0.604	0.786	0.818	Pk Hr Factor	0.833	0.600	0.797
7 - 9 Volume	24	33	57	4 - 6 Volume	31	47	78
7 - 9 Peak Hour	08:00	07:45	08:00	4 - 6 Peak Hour	16:45	16:00	16:00
7 - 9 Pk Volume	14	22	36	4 - 6 Pk Volume	18	36	51
Pk Hr Factor	0.583	0.786	0.818	Pk Hr Factor	0.563	0.600	0.797

Prepared by NDS/ATD

VOLUME

Kreuzer Ln W/O Fourth Ave

Day: Thursday
Date: 2/15/2018

City: Napa
Project #: CA18_8062_003

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	971	901	1,872

AM Period	NB	SB	EB	WB	TOTAL	PM Period	NB	SB	EB	WB	TOTAL
00:00			0	1	1	12:00			23	9	32
00:15			2	0	2	12:15			20	10	30
00:30			0	0	0	12:30			21	11	32
00:45			1	0	1	12:45			19	12	31
01:00			1	0	1	13:00			12	19	31
01:15			0	0	0	13:15			11	15	26
01:30			0	0	0	13:30			11	12	23
01:45			0	0	0	13:45			12	11	23
02:00			1	2	3	14:00			22	16	38
02:15			0	0	0	14:15			18	11	29
02:30			1	1	2	14:30			15	10	25
02:45			0	1	1	14:45			22	28	50
03:00			1	1	2	15:00			17	36	53
03:15			0	0	0	15:15			26	22	48
03:30			0	1	1	15:30			17	27	44
03:45			0	1	1	15:45			14	14	28
04:00			1	1	2	16:00			24	11	35
04:15			0	2	2	16:15			18	29	47
04:30			1	2	3	16:30			22	28	50
04:45			0	2	5	16:45			16	14	30
05:00			0	2	2	17:00			26	17	43
05:15			2	5	7	17:15			15	21	36
05:30			5	5	10	17:30			28	14	42
05:45			5	7	12	17:45			16	13	29
06:00			10	9	19	18:00			25	14	39
06:15			12	6	18	18:15			19	8	27
06:30			24	7	31	18:30			13	7	20
06:45			17	8	25	18:45			12	11	23
07:00			11	13	24	19:00			6	4	10
07:15			18	15	33	19:15			5	4	9
07:30			7	18	25	19:30			7	2	9
07:45			16	28	44	19:45			8	2	10
08:00			29	41	70	20:00			4	7	11
08:15			22	28	50	20:15			8	3	11
08:30			10	24	34	20:30			5	1	6
08:45			11	15	26	20:45			11	2	13
09:00			14	14	28	21:00			9	1	10
09:15			8	10	18	21:15			4	2	6
09:30			8	18	26	21:30			4	2	6
09:45			12	10	22	21:45			6	5	11
10:00			10	11	21	22:00			3	1	4
10:15			12	12	24	22:15			4	0	4
10:30			11	19	30	22:30			0	0	0
10:45			16	17	33	22:45			3	2	5
11:00			12	11	23	23:00			1	0	1
11:15			15	15	30	23:15			4	0	4
11:30			9	11	20	23:30			4	0	4
11:45			24	15	39	23:45			2	1	3
TOTALS			359	412	771	TOTALS			612	489	1101
SPLIT %			46.6%	53.4%	41.2%	SPLIT %			55.6%	44.4%	58.8%

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	971	901	1,872

AM Peak Hour	11:45	07:45	07:45	PM Peak Hour	17:30	14:45	14:45
AM Pk Volume	88	121	198	PM Pk Volume	88	113	195
Pk Hr Factor	0.917	0.738	0.707	Pk Hr Factor	0.786	0.785	0.920
7 - 9 Volume	124	182	306	4 - 6 Volume	165	147	312
7 - 9 Peak Hour	07:45	07:45	07:45	4 - 6 Peak Hour	16:45	16:15	16:15
7 - 9 Pk Volume	77	121	198	4 - 6 Pk Volume	85	88	170
Pk Hr Factor	0.664	0.738	0.707	Pk Hr Factor	0.759	0.759	0.850

Winery Traffic Information / Trip Generation Sheet

Project Name: Caldwell Vineyard Project Scenario: Permitted

Traffic during a Typical Weekday

Number of FT employees: 2	x 3.05 one-way trips per employee	=	6 daily trips.
Number of PT employees: 1	x 1.90 one-way trips per employee	=	2 daily trips.
Average number of weekday visitors: 8	/ 2.6 visitors per vehicle x 2 one-way trips	=	6 daily trips.
Gallons of production: 25000	/ 1,000 x .009 truck trips daily[3] x 2 one-way trips	=	0 daily trips.
	Total	=	15 daily trips.
	Number of total weekday trips x .38	=	6 PM peak trips.

Traffic during a Typical Saturday

Number of FT employees (on Saturdays): 2	x 3.05 one-way trips per employee	=	6 daily trips.
Number of PT employees (on Saturdays): 1	x 1.90 one-way trips per employee	=	2 daily trips.
Average number of weekend visitors: 8	/ 2.8 visitors per vehicle x 2 one-way trips	=	6 daily trips.
	Total	=	14 daily trips.
	Number of total Saturday trips x .57	=	8 PM peak trips.

Traffic during a Crush Saturday

Number of FT employees (during crush): 2	x 3.05 one-way trips per employee	=	6 daily trips.
Number of PT employees (during crush): 1	x 1.90 one-way trips per employee	=	2 daily trips.
Average number of weekend visitors: 8	/ 2.8 visitors per vehicle x 2 one-way trips	=	6 daily trips.
Gallons of production: 25000	/ 1,000 x .009 truck trips daily x 2 one-way trips	=	0 daily trips.
Avg. annual tons of grape on-haul: 0	x .11 truck trips daily[4] x 2 one-way trips	=	0 daily trips.
	Total	=	14 daily trips.
	Number of total Saturday trips x .57	=	8 PM peak trips.

Largest Marketing Event- Additional Traffic

Number of event staff (largest event): 0	x 2 one-way trips per staff person	=	0 trips.
Number of visitors (largest event): 60	/ 2.8 visitors per vehicle x 2 one-way trips	=	43 trips.
Number of special event truck trips (largest event): 0	x 2 one-way trips	=	0 trips.

[3] Assumes 1.47 materials & supplies trips + 0.8 case goods trips per 1,000 gallons of production / 250 days per year (see *Traffic Information Sheet Addendum* for reference).
[4] Assumes 4 tons per trip / 36 crush days per year (see *Traffic Information Sheet Addendum* for reference).

Winery Traffic Information / Trip Generation Sheet

Project Name: Caldwell Vineyard Project Scenario: Existing

Traffic during a Typical Weekday

Number of FT employees: 2 x 3.05 one-way trips per employee = 6 daily trips.

Number of PT employees: 1 x 1.90 one-way trips per employee = 2 daily trips.

Average number of weekday visitors: 8 / 2.6 visitors per vehicle x 2 one-way trips = 6 daily trips.

Gallons of production: 24191 / 1,000 x .009 truck trips daily[3] x 2 one-way trips = 0 daily trips.

Total = 15 **daily trips.**

Number of total weekday trips x .38 = 6 **PM peak trips.**

Traffic during a Typical Saturday

Number of FT employees (on Saturdays): 2 x 3.05 one-way trips per employee = 6 daily trips.

Number of PT employees (on Saturdays): 1 x 1.90 one-way trips per employee = 2 daily trips.

Average number of weekend visitors: 8 / 2.8 visitors per vehicle x 2 one-way trips = 6 daily trips.

Total = 14 **daily trips.**

Number of total Saturday trips x .57 = 8 **PM peak trips.**

Traffic during a Crush Saturday

Number of FT employees (during crush): 2 x 3.05 one-way trips per employee = 6 daily trips.

Number of PT employees (during crush): 1 x 1.90 one-way trips per employee = 2 daily trips.

Average number of weekend visitors: 8 / 2.8 visitors per vehicle x 2 one-way trips = 6 daily trips.

Gallons of production: 24191 / 1,000 x .009 truck trips daily x 2 one-way trips = 0 daily trips.

Avg. annual tons of grape on-haul: 0 x .11 truck trips daily[4] x 2 one-way trips = 0 daily trips.

Total = 14 **daily trips.**

Number of total Saturday trips x .57 = 8 **PM peak trips.**

Largest Marketing Event- Additional Traffic

Number of event staff (largest event): 4 x 2 one-way trips per staff person = 8 trips.

Number of visitors (largest event): 60 / 2.8 visitors per vehicle x 2 one-way trips = 43 trips.

Number of special event truck trips (largest event): 2 x 2 one-way trips = 4 trips.

[3] Assumes 1.47 materials & supplies trips + 0.8 case goods trips per 1,000 gallons of production / 250 days per year (see *Traffic Information Sheet Addendum* for reference).

[4] Assumes 4 tons per trip / 36 crush days per year (see *Traffic Information Sheet Addendum* for reference).

Winery Traffic Information / Trip Generation Sheet

Project Name: Caldwell Vineyard Project Scenario: Proposed

Traffic during a Typical Weekday

Number of FT employees: 6 x 3.05 one-way trips per employee = 18 daily trips.

Number of PT employees: 6 x 1.90 one-way trips per employee = 11 daily trips.

Average number of weekday visitors: 60 / 2.6 visitors per vehicle x 2 one-way trips = 46 daily trips.

Gallons of production: 35000 / 1,000 x .009 truck trips daily[3] x 2 one-way trips = 1 daily trips.

Total = 76 daily trips.

Number of total weekday trips x .38 = 29 PM peak trips.

Traffic during a Typical Saturday

Number of FT employees (on Saturdays): 2 x 3.05 one-way trips per employee = 6 daily trips.

Number of PT employees (on Saturdays): 1 x 1.90 one-way trips per employee = 2 daily trips.

Average number of weekend visitors: 60 / 2.8 visitors per vehicle x 2 one-way trips = 43 daily trips.

Total = 51 daily trips.

Number of total Saturday trips x .57 = 29 PM peak trips.

Traffic during a Crush Saturday

Number of FT employees (during crush): 6 x 3.05 one-way trips per employee = 18 daily trips.

Number of PT employees (during crush): 6 x 1.90 one-way trips per employee = 11 daily trips.

Average number of weekend visitors: 60 / 2.8 visitors per vehicle x 2 one-way trips = 43 daily trips.

Gallons of production: 35000 / 1,000 x .009 truck trips daily x 2 one-way trips = 1 daily trips.

Avg. annual tons of grape on-haul: 0 x .11 truck trips daily[4] x 2 one-way trips = 0 daily trips.

Total = 73 daily trips.

Number of total Saturday trips x .57 = 42 PM peak trips.

Largest Marketing Event- Additional Traffic

Number of event staff (largest event): 6 x 2 one-way trips per staff person = 12 trips.

Number of visitors (largest event): 200 / 2.8 visitors per vehicle x 2 one-way trips = 143 trips.

Number of special event truck trips (largest event): 2 x 2 one-way trips = 4 trips.

[3] Assumes 1.47 materials & supplies trips + 0.8 case goods trips per 1,000 gallons of production / 250 days per year (see *Traffic Information Sheet Addendum* for reference).

[4] Assumes 4 tons per trip / 36 crush days per year (see *Traffic Information Sheet Addendum* for reference).

HCS7: Two-Lane Highways Release 7.3

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Kevin Rangel
Agency/Co.	W-Trans
Date Performed	2/16/2018
Analysis Time Period	AM Existing
Highway	Fourth Avenue Eastbound
From/To	Penny Lane to Kreuzer Lane
Jurisdiction	Napa County
Analysis Year	2018
Description	Cadwell Vineyards TIS

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.71	
Shoulder width	0.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.2	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Rolling		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	18	/mi

Analysis direction volume, Vd 77 veh/h
Opposing direction volume, Vo 121 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	2.7		2.4	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.904		0.919	
Grade adj. factor,(note-1) fg	0.68		0.73	
Directional flow rate,(note-2) vi	176	pc/h	254	pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	4.2	mi/h
Adj. for access point density,(note-3) fA	4.5	mi/h
Free-flow speed, FFSd	36.3	mi/h
Adjustment for no-passing zones, fnp	2.7*	mi/h
Average travel speed, ATSd	30.3	mi/h
Percent Free Flow Speed, PFFS	83.4	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.8		1.8	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.954		0.954	
Grade adjustment factor,(note-1) fg	0.74		0.78	
Directional flow rate,(note-2) vi	154	pc/h	229	pc/h
Base percent time-spent-following,(note-4) BPTSFd	17.7	%		
Adjustment for no-passing zones, fnp	55.3			
Percent time-spent-following, PTSFd	39.9	%		

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.06	
Peak 15-min vehicle-miles of travel, VMT15	33	veh-mi
Peak-hour vehicle-miles of travel, VMT60	92	veh-mi
Peak 15-min total travel time, TT15	1.1	veh-h
Capacity from ATS, CdATS	1663	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.2	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	30.3	mi/h
Percent time-spent-following, PTSFd (from above)	39.9	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	25
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	108.5
Effective width of outside lane, We	19.38
Effective speed factor, St	2.61
Bicycle LOS Score, BLOS	3.42
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS7: Two-Lane Highways Release 7.3

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Kevin Rangel
Agency/Co.	W-Trans
Date Performed	2/16/2018
Analysis Time Period	PM Existing
Highway	Fourth Avenue Eastbound
From/To	Penny Lane to Kreuzer Lane
Jurisdiction	Napa County
Analysis Year	2018
Description	Cadwell Vineyards TIS

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.92	
Shoulder width	0.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.2	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Rolling		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	18	/mi

Analysis direction volume, Vd	82	veh/h
Opposing direction volume, Vo	113	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	2.7		2.6	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.904		0.909	
Grade adj. factor,(note-1) fg	0.67		0.69	
Directional flow rate,(note-2) vi	147	pc/h	196	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	4.2	mi/h
Adj. for access point density,(note-3) fA	4.5	mi/h
Free-flow speed, FFSd	36.3	mi/h
Adjustment for no-passing zones, fnp	2.7*	mi/h
Average travel speed, ATSd	30.9	mi/h
Percent Free Flow Speed, PFFS	85.2	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.9		1.8	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.949		0.954	
Grade adjustment factor,(note-1) fg	0.73		0.75	
Directional flow rate,(note-2) vi	129	pc/h	172	pc/h
Base percent time-spent-following,(note-4) BPTSFd	14.6	%		
Adjustment for no-passing zones, fnp	55.8			
Percent time-spent-following, PTSFd	38.5	%		

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.05	
Peak 15-min vehicle-miles of travel, VMT15	27	veh-mi
Peak-hour vehicle-miles of travel, VMT60	98	veh-mi
Peak 15-min total travel time, TT15	0.9	veh-h
Capacity from ATS, CdATS	1663	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.2	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	30.9	mi/h
Percent time-spent-following, PTSFd (from above)	38.5	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following With Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	25
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	89.1
Effective width of outside lane, We	19.08
Effective speed factor, St	2.61
Bicycle LOS Score, BLOS	3.38
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS7: Two-Lane Highways Release 7.3

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Kevin Rangel
Agency/Co.	W-Trans
Date Performed	2/16/2018
Analysis Time Period	AM Existing + Project
Highway	Fourth Avenue Eastbound
From/To	Penny Lane to Kreuzer Lane
Jurisdiction	Napa County
Analysis Year	2018
Description	Cadwell Vineyards TIS

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.71	
Shoulder width	0.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.2	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Rolling		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	18	/mi

Analysis direction volume, Vd 82 veh/h
Opposing direction volume, Vo 121 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	2.6		2.4	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.909		0.919	
Grade adj. factor,(note-1) fg	0.68		0.73	
Directional flow rate,(note-2) vi	187	pc/h	254	pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	4.2	mi/h
Adj. for access point density,(note-3) fA	4.5	mi/h
Free-flow speed, FFSd	36.3	mi/h
Adjustment for no-passing zones, fnp	2.7*	mi/h
Average travel speed, ATSd	30.2	mi/h
Percent Free Flow Speed, PFFS	83.1	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.8		1.8	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.954		0.954	
Grade adjustment factor,(note-1) fg	0.74		0.78	
Directional flow rate,(note-2) vi	164	pc/h	229	pc/h
Base percent time-spent-following,(note-4) BPTSFd	18.7	%		
Adjustment for no-passing zones, fnp	56.6			
Percent time-spent-following, PTSFd	42.3	%		

Level of Service and Other Performance Measures

Level of service, LOS	B	
Volume to capacity ratio, v/c	0.07	
Peak 15-min vehicle-miles of travel, VMT15	35	veh-mi
Peak-hour vehicle-miles of travel, VMT60	98	veh-mi
Peak 15-min total travel time, TT15	1.2	veh-h
Capacity from ATS, CdATS	1663	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.2	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	30.2	mi/h
Percent time-spent-following, PTSFd (from above)	42.3	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	25
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	115.5
Effective width of outside lane, We	19.08
Effective speed factor, St	2.61
Bicycle LOS Score, BLOS	3.51
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS7: Two-Lane Highways Release 7.3

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Kevin Rangel
Agency/Co.	W-Trans
Date Performed	2/16/2018
Analysis Time Period	PM Existing + Project
Highway	Fourth Avenue Eastbound
From/To	Penny Lane to Kreuzer Lane
Jurisdiction	Napa County
Analysis Year	2018
Description	Cadwell Vineyards TIS

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.92	
Shoulder width	0.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.2	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Rolling		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	18	/mi

Analysis direction volume, Vd	90	veh/h
Opposing direction volume, Vo	128	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	2.7		2.5	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.904		0.914	
Grade adj. factor,(note-1) fg	0.67		0.70	
Directional flow rate,(note-2) vi	162	pc/h	217	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	4.2	mi/h
Adj. for access point density,(note-3) fA	4.5	mi/h
Free-flow speed, FFSd	36.3	mi/h
Adjustment for no-passing zones, fnp	2.7*	mi/h
Average travel speed, ATSd	30.7	mi/h
Percent Free Flow Speed, PFFS	84.5	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.9		1.8	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.949		0.954	
Grade adjustment factor,(note-1) fg	0.73		0.76	
Directional flow rate,(note-2) vi	141	pc/h	192	pc/h
Base percent time-spent-following,(note-4) BPTSFd	15.9	%		
Adjustment for no-passing zones, fnp	56.1			
Percent time-spent-following, PTSFd	39.7	%		

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.06	
Peak 15-min vehicle-miles of travel, VMT15	29	veh-mi
Peak-hour vehicle-miles of travel, VMT60	108	veh-mi
Peak 15-min total travel time, TT15	0.9	veh-h
Capacity from ATS, CdATS	1663	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.2	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	30.7	mi/h
Percent time-spent-following, PTSFd (from above)	39.7	
Level of service, LOSd (from above)	A	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	25
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	97.8
Effective width of outside lane, We	18.60
Effective speed factor, St	2.61
Bicycle LOS Score, BLOS	3.52
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS7: Two-Lane Highways Release 7.3

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Kevin Rangel
Agency/Co.	W-Trans
Date Performed	2/16/2018
Analysis Time Period	AM Existing
Highway	Fourth Avenue Westbound
From/To	Kreuzer Lane to Penny Lane
Jurisdiction	Napa County
Analysis Year	2018
Description	Cadwell Vineyards TIS

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.71	
Shoulder width	0.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.2	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Rolling		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	18	/mi

Analysis direction volume, Vd 121 veh/h
Opposing direction volume, Vo 77 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	2.4		2.7	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.919		0.904	
Grade adj. factor,(note-1) fg	0.73		0.68	
Directional flow rate,(note-2) vi	254	pc/h	176	pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	4.2	mi/h
Adj. for access point density,(note-3) fA	4.5	mi/h
Free-flow speed, FFSd	36.3	mi/h
Adjustment for no-passing zones, fnp	2.7*	mi/h
Average travel speed, ATSd	30.3	mi/h
Percent Free Flow Speed, PFFS	83.4	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.8		1.8	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.954		0.954	
Grade adjustment factor,(note-1) fg	0.78		0.74	
Directional flow rate,(note-2) vi	229	pc/h	154	pc/h
Base percent time-spent-following,(note-4) BPTSFd	24.2	%		
Adjustment for no-passing zones, fnp	55.3			
Percent time-spent-following, PTSFd	57.3	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.10	
Peak 15-min vehicle-miles of travel, VMT15	51	veh-mi
Peak-hour vehicle-miles of travel, VMT60	145	veh-mi
Peak 15-min total travel time, TT15	1.7	veh-h
Capacity from ATS, CdATS	1663	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.2	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	30.3	mi/h
Percent time-spent-following, PTSFd (from above)	57.3	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	25
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	170.4
Effective width of outside lane, We	16.74
Effective speed factor, St	2.61
Bicycle LOS Score, BLOS	4.12
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS7: Two-Lane Highways Release 7.3

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Kevin Rangel
Agency/Co.	W-Trans
Date Performed	2/16/2018
Analysis Time Period	PM Existing
Highway	Fourth Avenue Westbound
From/To	Kreuzer Lane to Penny Lane
Jurisdiction	Napa County
Analysis Year	2018
Description	Cadwell Vineyards TIS

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.92	
Shoulder width	0.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.2	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Rolling		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	18	/mi

Analysis direction volume, Vd 113 veh/h
Opposing direction volume, Vo 82 veh/h

Average Travel Speed

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	2.6	2.7
PCE for RVs, ER	1.1	1.1
Heavy-vehicle adj. factor,(note-5) fHV	0.909	0.904
Grade adj. factor,(note-1) fg	0.69	0.67
Directional flow rate,(note-2) vi	196 pc/h	147 pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	4.2	mi/h
Adj. for access point density,(note-3) fA	4.5	mi/h
Free-flow speed, FFSd	36.3	mi/h
Adjustment for no-passing zones, fnp	2.7*	mi/h
Average travel speed, ATSd	30.9	mi/h
Percent Free Flow Speed, PFFS	85.2	%

Percent Time-Spent-Following

Direction	Analysis(d)	Opposing (o)
PCE for trucks, ET	1.8	1.9
PCE for RVs, ER	1.0	1.0
Heavy-vehicle adjustment factor, fHV	0.954	0.949
Grade adjustment factor,(note-1) fg	0.75	0.73
Directional flow rate,(note-2) vi	172 pc/h	129 pc/h
Base percent time-spent-following,(note-4) BPTSFd	18.9 %	
Adjustment for no-passing zones, fnp	55.8	
Percent time-spent-following, PTSFd	50.8 %	

Level of Service and Other Performance Measures

Level of service, LOS	B	
Volume to capacity ratio, v/c	0.07	
Peak 15-min vehicle-miles of travel, VMT15	37	veh-mi
Peak-hour vehicle-miles of travel, VMT60	136	veh-mi
Peak 15-min total travel time, TT15	1.2	veh-h
Capacity from ATS, CdATS	1663	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.2	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	30.9	mi/h
Percent time-spent-following, PTSFd (from above)	50.8	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	25
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	122.8
Effective width of outside lane, We	17.22
Effective speed factor, St	2.61
Bicycle LOS Score, BLOS	3.88
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS7: Two-Lane Highways Release 7.3

Phone: Fax:
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Directional Two-Lane Highway Segment Analysis

Analyst	Kevin Rangel
Agency/Co.	W-Trans
Date Performed	2/16/2018
Analysis Time Period	AM Existing + Project
Highway	Fourth Avenue Westbound
From/To	Kreuzer Lane to Penny Lane
Jurisdiction	Napa County
Analysis Year	2018
Description	Cadwell Vineyards TIS

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.71	
Shoulder width	0.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.2	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Rolling		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	18	/mi

Analysis direction volume, Vd 121 veh/h
Opposing direction volume, Vo 82 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	2.4		2.6	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.919		0.909	
Grade adj. factor,(note-1) fg	0.73		0.68	
Directional flow rate,(note-2) vi	254	pc/h	187	pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	4.2	mi/h
Adj. for access point density,(note-3) fA	4.5	mi/h
Free-flow speed, FFSd	36.3	mi/h
Adjustment for no-passing zones, fnp	2.7*	mi/h
Average travel speed, ATSd	30.2	mi/h
Percent Free Flow Speed, PFFS	83.1	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.8		1.8	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.954		0.954	
Grade adjustment factor,(note-1) fg	0.78		0.74	
Directional flow rate,(note-2) vi	229	pc/h	164	pc/h
Base percent time-spent-following,(note-4) BPTSFd	24.2	%		
Adjustment for no-passing zones, fnp	56.6			
Percent time-spent-following, PTSFd	57.2	%		

Level of Service and Other Performance Measures

Level of service, LOS	C	
Volume to capacity ratio, v/c	0.10	
Peak 15-min vehicle-miles of travel, VMT15	51	veh-mi
Peak-hour vehicle-miles of travel, VMT60	145	veh-mi
Peak 15-min total travel time, TT15	1.7	veh-h
Capacity from ATS, CdATS	1663	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.2	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	30.2	mi/h
Percent time-spent-following, PTSFd (from above)	57.2	
Level of service, LOSd (from above)	C	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following With Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	25
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	170.4
Effective width of outside lane, We	16.74
Effective speed factor, St	2.61
Bicycle LOS Score, BLOS	4.12
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

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HCS7: Two-Lane Highways Release 7.3

Phone: Fax:
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Directional Two-Lane Highway Segment Analysis

Analyst	Kevin Rangel
Agency/Co.	W-Trans
Date Performed	2/16/2018
Analysis Time Period	PM Existing + Project
Highway	Fourth Avenue Westbound
From/To	Kreuzer Lane to Penny Lane
Jurisdiction	Napa County
Analysis Year	2018
Description	Cadwell Vineyards TIS

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.92	
Shoulder width	0.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	1.2	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Rolling		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	18	/mi

Analysis direction volume, Vd	128	veh/h
Opposing direction volume, Vo	90	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	2.5		2.7	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.914		0.904	
Grade adj. factor,(note-1) fg	0.70		0.67	
Directional flow rate,(note-2) vi	217	pc/h	162	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	4.2	mi/h
Adj. for access point density,(note-3) fA	4.5	mi/h
Free-flow speed, FFSd	36.3	mi/h
Adjustment for no-passing zones, fnp	2.7*	mi/h
Average travel speed, ATSd	30.7	mi/h
Percent Free Flow Speed, PFFS	84.5	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.8		1.9	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.954		0.949	
Grade adjustment factor,(note-1) fg	0.76		0.73	
Directional flow rate,(note-2) vi	192	pc/h	141	pc/h
Base percent time-spent-following,(note-4) BPTSFd	20.8	%		
Adjustment for no-passing zones, fnp	56.1			
Percent time-spent-following, PTSFd	53.1	%		

Level of Service and Other Performance Measures

Level of service, LOS	B	
Volume to capacity ratio, v/c	0.08	
Peak 15-min vehicle-miles of travel, VMT15	42	veh-mi
Peak-hour vehicle-miles of travel, VMT60	154	veh-mi
Peak 15-min total travel time, TT15	1.4	veh-h
Capacity from ATS, CdATS	1663	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	1.2	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	30.7	mi/h
Percent time-spent-following, PTSFd (from above)	53.1	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	25
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	139.1
Effective width of outside lane, We	16.32
Effective speed factor, St	2.61
Bicycle LOS Score, BLOS	4.09
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS7: Two-Lane Highways Release 7.3

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Kevin Rangel
Agency/Co.	W-Trans
Date Performed	2/22/2018
Analysis Time Period	AM Existing
Highway	Fourth Avenue Northbound
From/To	Kreuzer Ln to Coombsville Rd
Jurisdiction	Napa County
Analysis Year	2018
Description	Cadwell Vineyards TIS

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.76	
Shoulder width	0.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.5	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Rolling		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	40	/mi

Analysis direction volume, Vd	86	veh/h
Opposing direction volume, Vo	111	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	2.6		2.5	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.909		0.914	
Grade adj. factor,(note-1) fg	0.68		0.71	
Directional flow rate,(note-2) vi	183	pc/h	225	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	4.2	mi/h
Adj. for access point density,(note-3) fA	10.0	mi/h
Free-flow speed, FFSd	30.8	mi/h
Adjustment for no-passing zones, fnp	2.7*	mi/h
Average travel speed, ATSd	24.9	mi/h
Percent Free Flow Speed, PFFS	81.0	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.8		1.8	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.954		0.954	
Grade adjustment factor,(note-1) fg	0.74		0.76	
Directional flow rate,(note-2) vi	160	pc/h	201	pc/h
Base percent time-spent-following,(note-4) BPTSFd	17.7	%		
Adjustment for no-passing zones, fnp	58.5			
Percent time-spent-following, PTSFd	43.6	%		

Level of Service and Other Performance Measures

Level of service, LOS	B	
Volume to capacity ratio, v/c	0.07	
Peak 15-min vehicle-miles of travel, VMT15	14	veh-mi
Peak-hour vehicle-miles of travel, VMT60	43	veh-mi
Peak 15-min total travel time, TT15	0.6	veh-h
Capacity from ATS, CdATS	1663	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.5	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	24.9	mi/h
Percent time-spent-following, PTSFd (from above)	43.6	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	25
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	113.2
Effective width of outside lane, We	18.84
Effective speed factor, St	2.61
Bicycle LOS Score, BLOS	3.54
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS7: Two-Lane Highways Release 7.3

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Kevin Rangel
Agency/Co.	W-Trans
Date Performed	2/22/2018
Analysis Time Period	PM Existing
Highway	Fourth Avenue Northbound
From/To	Kreuzer Ln to Coombsville Rd
Jurisdiction	Napa County
Analysis Year	2018
Description	Cadwell Vineyards TIS

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.89	
Shoulder width	0.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.5	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Rolling		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	40	/mi

Analysis direction volume, Vd	79	veh/h
Opposing direction volume, Vo	106	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	2.7		2.6	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.904		0.909	
Grade adj. factor,(note-1) fg	0.67		0.69	
Directional flow rate,(note-2) vi	147	pc/h	190	pc/h

Free-Flow Speed from Field Measurement:

Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	4.2	mi/h
Adj. for access point density,(note-3) fA	10.0	mi/h
Free-flow speed, FFSd	30.8	mi/h
Adjustment for no-passing zones, fnp	2.7*	mi/h
Average travel speed, ATSd	25.5	mi/h
Percent Free Flow Speed, PFFS	82.7	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.9		1.8	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.949		0.954	
Grade adjustment factor,(note-1) fg	0.73		0.74	
Directional flow rate,(note-2) vi	128	pc/h	169	pc/h
Base percent time-spent-following,(note-4) BPTSFd	14.5	%		
Adjustment for no-passing zones, fnp	56.0			
Percent time-spent-following, PTSFd	38.6	%		

Level of Service and Other Performance Measures

Level of service, LOS	A	
Volume to capacity ratio, v/c	0.05	
Peak 15-min vehicle-miles of travel, VMT15	11	veh-mi
Peak-hour vehicle-miles of travel, VMT60	40	veh-mi
Peak 15-min total travel time, TT15	0.4	veh-h
Capacity from ATS, CdATS	1663	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.5	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	25.5	mi/h
Percent time-spent-following, PTSFd (from above)	38.6	
Level of service, LOSd (from above)	A	

Average Travel Speed With Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following With Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	25
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	88.8
Effective width of outside lane, We	19.26
Effective speed factor, St	2.61
Bicycle LOS Score, BLOS	3.34
Bicycle LOS	C

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS7: Two-Lane Highways Release 7.3

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Kevin Rangel
Agency/Co.	W-Trans
Date Performed	2/22/2018
Analysis Time Period	AM Existing
Highway	Fourth Avenue Southbound
From/To	Coombsville Rd to Kreuzer Ln
Jurisdiction	Napa County
Analysis Year	2018
Description	Cadwell Vineyards TIS

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.76	
Shoulder width	0.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.5	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Rolling		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	40	/mi

Analysis direction volume, Vd	111	veh/h
Opposing direction volume, Vo	86	veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	2.5		2.6	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.914		0.909	
Grade adj. factor,(note-1) fg	0.71		0.68	
Directional flow rate,(note-2) vi	225	pc/h	183	pc/h

free-Flow Speed from Field Measurement:		
Field measured speed,(note-3) S FM	-	mi/h
Observed total demand,(note-3) V	-	veh/h

Estimated Free-Flow Speed:		
Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	4.2	mi/h
Adj. for access point density,(note-3) fA	10.0	mi/h
Free-flow speed, FFSd	30.8	mi/h
Adjustment for no-passing zones, fnp	2.7*	mi/h
Average travel speed, ATSd	24.9	mi/h
Percent Free Flow Speed, PFFS	81.0	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.8		1.8	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.954		0.954	
Grade adjustment factor,(note-1) fg	0.76		0.74	
Directional flow rate,(note-2) vi	201	pc/h	160	pc/h
Base percent time-spent-following,(note-4) BPTSFd	21.6	%		
Adjustment for no-passing zones, fnp	58.5			
Percent time-spent-following, PTSFd	54.2	%		

Level of Service and Other Performance Measures

Level of service, LOS	B	
Volume to capacity ratio, v/c	0.09	
Peak 15-min vehicle-miles of travel, VMT15	18	veh-mi
Peak-hour vehicle-miles of travel, VMT60	56	veh-mi
Peak 15-min total travel time, TT15	0.7	veh-h
Capacity from ATS, CdATS	1663	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.5	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	24.9	mi/h
Percent time-spent-following, PTSFd (from above)	54.2	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following With Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT15	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	25
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	146.1
Effective width of outside lane, We	17.34
Effective speed factor, St	2.61
Bicycle LOS Score, BLOS	3.94
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

HCS7: Two-Lane Highways Release 7.3

Phone: Fax:
E-Mail:

Directional Two-Lane Highway Segment Analysis

Analyst	Kevin Rangel
Agency/Co.	W-Trans
Date Performed	2/22/2018
Analysis Time Period	PM Existing
Highway	Fourth Avenue Southbound
From/To	Coombsville Rd to Kreuzer Ln
Jurisdiction	Napa County
Analysis Year	2018
Description	Cadwell Vineyards TIS

Input Data

Highway class	Class 2		Peak hour factor, PHF	0.89	
Shoulder width	0.0	ft	% Trucks and buses	6	%
Lane width	12.0	ft	% Trucks crawling	0.0	%
Segment length	0.5	mi	Truck crawl speed	0.0	mi/hr
Terrain type	Rolling		% Recreational vehicles	4	%
Grade: Length	-	mi	% No-passing zones	100	%
Up/down	-	%	Access point density	40	/mi

Analysis direction volume, Vd 105 veh/h
Opposing direction volume, Vo 79 veh/h

Average Travel Speed

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	2.6		2.7	
PCE for RVs, ER	1.1		1.1	
Heavy-vehicle adj. factor,(note-5) fHV	0.909		0.904	
Grade adj. factor,(note-1) fg	0.69		0.67	
Directional flow rate,(note-2) vi	190	pc/h	147	pc/h

Free-Flow Speed from Field Measurement:
Field measured speed,(note-3) S FM - mi/h
Observed total demand,(note-3) V - veh/h

Estimated Free-Flow Speed:

Base free-flow speed,(note-3) BFFS	45.0	mi/h
Adj. for lane and shoulder width,(note-3) fLS	4.2	mi/h
Adj. for access point density,(note-3) fA	10.0	mi/h
Free-flow speed, FFSd	30.8	mi/h
Adjustment for no-passing zones, fnp	2.7*	mi/h
Average travel speed, ATSd	25.5	mi/h
Percent Free Flow Speed, PFFS	82.7	%

Percent Time-Spent-Following

Direction	Analysis(d)		Opposing (o)	
PCE for trucks, ET	1.8		1.9	
PCE for RVs, ER	1.0		1.0	
Heavy-vehicle adjustment factor, fHV	0.954		0.949	
Grade adjustment factor,(note-1) fg	0.74		0.73	
Directional flow rate,(note-2) vi	169	pc/h	128	pc/h
Base percent time-spent-following,(note-4) BPTSFd	18.6	%		
Adjustment for no-passing zones, fnp	56.0			
Percent time-spent-following, PTSFd	50.5	%		

Level of Service and Other Performance Measures

Level of service, LOS	B	
Volume to capacity ratio, v/c	0.07	
Peak 15-min vehicle-miles of travel, VMT15	15	veh-mi
Peak-hour vehicle-miles of travel, VMT60	53	veh-mi
Peak 15-min total travel time, TT15	0.6	veh-h
Capacity from ATS, CdATS	1663	veh/h
Capacity from PTSF, CdPTSF	1700	veh/h
Directional Capacity	1700	veh/h

Passing Lane Analysis

Total length of analysis segment, Lt	0.5	mi
Length of two-lane highway upstream of the passing lane, Lu	-	mi
Length of passing lane including tapers, Lpl	-	mi
Average travel speed, ATSd (from above)	25.5	mi/h
Percent time-spent-following, PTSFd (from above)	50.5	
Level of service, LOSd (from above)	B	

Average Travel Speed with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld	-	mi
Adj. factor for the effect of passing lane on average speed, fpl	-	
Average travel speed including passing lane, ATSpl	-	
Percent free flow speed including passing lane, PFFSpl	0.0	%

Percent Time-Spent-Following with Passing Lane

Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	-	mi
Length of two-lane highway downstream of effective length of the passing lane for percent time-spent-following, Ld	-	mi
Adj. factor for the effect of passing lane on percent time-spent-following, fpl	-	
Percent time-spent-following including passing lane, PTSFpl	-	%

Level of Service and Other Performance Measures with Passing Lane

Level of service including passing lane, LOSpl	A	
Peak 15-min total travel time, TT1S	-	veh-h

Bicycle Level of Service

Posted speed limit, Sp	25
Percent of segment with occupied on-highway parking	0
Pavement rating, P	3
Flow rate in outside lane, vOL	119.1
Effective width of outside lane, We	17.64
Effective speed factor, St	2.61
Bicycle LOS Score, BLOS	3.79
Bicycle LOS	D

Notes:
1. Note that the adjustment factor for level terrain is 1.00, as level terrain is one of the base conditions. For the purpose of grade adjustment, specific downgrade segments are treated as level terrain.
2. If vi (vd or vo) >= 1,700 pc/h, terminate analysis-the LOS is F.
3. For the analysis direction only and for v>200 veh/h.
4. For the analysis direction only.
5. Use alternative Exhibit 15-14 if some trucks operate at crawl speeds on a specific downgrade.

* These items have been entered or edited to override calculated value

From:	David Rude
To:	Balcher, Wyntress
Cc:	Roberta Rude
Subject:	Caldwell Winery Expansion; Kreuzer Lane Widening
Date:	Monday, February 26, 2018 5:01:50 PM
Attachments:	Caldwell Winery Expansion Kreuzer Lane.pdf

Hello

We own the home (and vineyard) at 245 Kreuzer Lane. As we understand the Caldwell Winery expansion details, the road leading (a few hundred feet anyway) to our house is to be widened. If this were to occur, our 21 Heritage Olive trees, planted before the winery was created, will be killed. They are centered approximately three/four feet from the edge of Kreuzer Lane. The road is for ingress/egress to our house on Kreuzer Lane, as well as to access the Caldwell Winery. The road is on an easement (not county property) which predates our purchase of our home in 2010.
If the issue is the access of emergency vehicles to our house, and or to the Caldwell Winery past our house, we were at our house during the fires last October. I watched as numerous very large fire trucks (from multiple jurisdictions outside of Napa County) drove up and down our street along our property line (Kreuzer Lane) with ease.

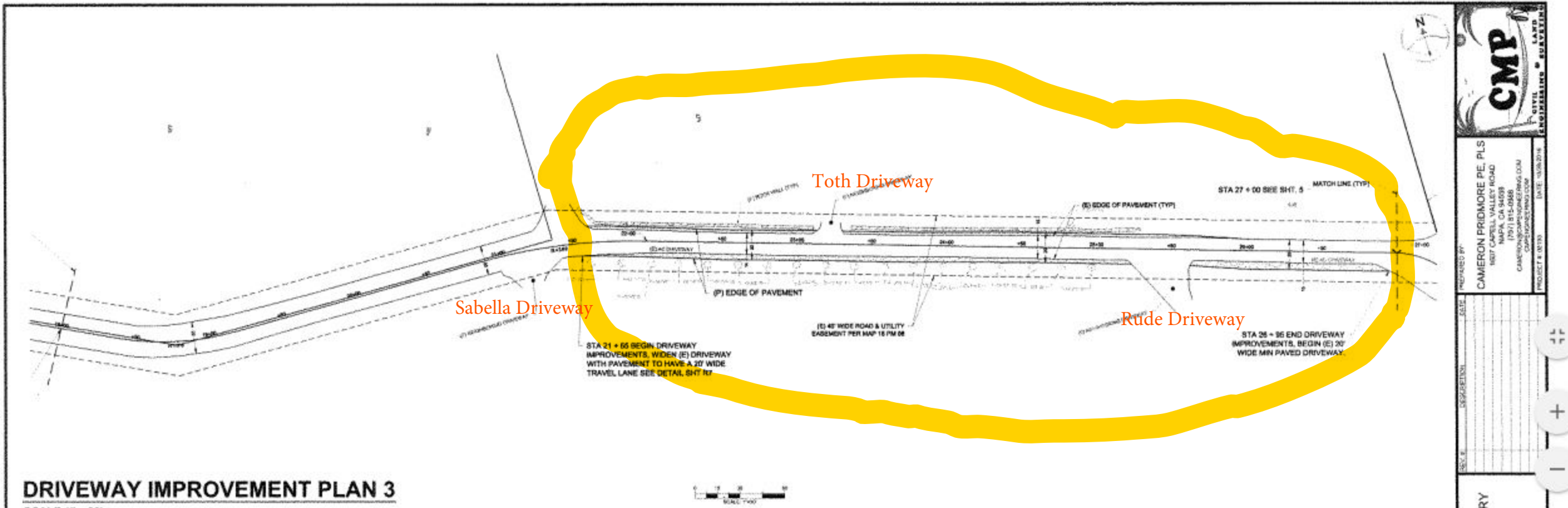
Please contact me if you would consider a visit to our house or if you require additional information. We plan to attend the March 7 meeting.

Also, we are the neighbor located closest to the Caldwell Winery.

Please reply with an email confirmation receipt.

Thank you

David H. Rude, Jr.
United Salt Corp.
AQUASALT, LLC
4800 San Felipe
Houston, TX 77056
713 877-2616



DRIVEWAY IMPROVEMENT PLAN 3

SCALE 1" = 30'

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SINGAPORE
PHILADELPHIA
CHICAGO
WASHINGTON, DC
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ALLIANCE WITH
MIRANDA & ESTAVILLO
SRI LANKA
ALLIANCE WITH
GOWERS INTERNATIONAL

February 22, 2018

VIA E-MAIL & OVERNIGHT MAIL

Joelle Gallagher, Commissioner
Michael Bayayne, Commissioner
Anne Cottrell, Commissioner
Terry Scott, Commissioner
Jeri Gill, Commissioner
c/o David Morrison, Director
COUNTY OF NAPA PLANNING COMMISSION
1195 Third Street, Suite 210
Napa, CA 94559

Re: 270 Kreuzer Lane – Napa, California
Caldwell Vineyards Use Permit No. P17-00074-MOD
APN Nos.: 045-310-056 and 045-310-055

Dear Commissioners:

This firm represents the Kreuzer Lane Protection Committee (the "KLPC"), a group of concerned property owners on Kreuzer Lane and in the surrounding neighborhood, in connection with the pending Use Permit Major Modification application (the "Project") for Caldwell Vineyards, the hearing on which is currently scheduled for March 7 at 1:00 p.m. The purpose of this letter is to request a short continuance of the hearing in order to allow for the necessary and appropriate time to review the additional traffic study that has been promised by the Sponsor, although not yet received.

As you are aware, a number of issues have been raised in connection with the Project, both with the Project Sponsor Caldwell Vineyards, and at a prior hearing before this Commission. Some of those issues were discussed by members of the KLPC with the Project Sponsor at a meeting on February 6, 2018.

In a letter to members of the KLPC on February 16, 2018, the Project Sponsor wrote in pertinent part as follows:

> Caldwell Vineyard, in consultation with the County, has agreed to prepare an additional Traffic Study for the Caldwell Vineyard project. The Traffic Study will include: project traffic generation; traffic counts for Fourth Street and Kreuzer Lane; existing conditions on both roadways; collision records; existing plus project conditions on both roadways; evaluation of stop sign warrant at intersection of Fourth Street and Kreuzer Lane; and recommended to address any significant impacts identified.

It is respectfully submitted that an "additional" traffic study is necessary and appropriate at this time, particularly given the concerns of the KLPC that the Planning Department and Initial Study has not properly analyzed the traffic impacts of the Project.

In short summary, the Initial Study curiously relies on a simplistic two-page calculation of traffic flow from a civil engineering firm, and not a traffic consultant. The calculation does not appear to properly calculate the traffic impacts of a 773% increase in total wine tasting visitors per year, a 225% increase in special event guests, and an unlimited increase in Custom Crush Producers. Even the PM Peak trip calculation submitted by the Sponsor shows a 5-fold increase in traffic on a one-lane narrow road.

More importantly, the Initial Study improperly attempts to incorporate and rely on an August 24, 2017 traffic study by W-Trans for the Paul Hobbs-Nathan Coombs Winery Project at 2184 Imola Avenue. That traffic study analyzes a project some half-mile and three intersections to the Southwest, *for which there is effectively no projected increase in traffic near Kreuzer Lane*, and so it never properly considers the impact of levels of service at Fourth Avenue and Kreuzer Lane.

Moreover, the Paul Hobbs entrance is directly off Fourth Avenue, into a vineyard and then to the winery. To access the Caldwell Winery location, a visitor must pass by more than 10 residences on a dead end lane, through a narrow private road section, and then descending down a steep narrow cliff-face road to a winery in a wildfire prone area

Please be advised that the KLPC intends to hire a traffic consultant to analyze the traffic impacts of the Project, either independently or through a peer review of the promised "additional" traffic study, or both.

But under any circumstances, given that the additional traffic study has not been received to date, it is not practical or feasible to conduct a meaningful review in advance of the scheduled March 7 hearing.

For these reasons, we would respectfully request that the hearing on the above-referenced application be continued to a date next on the Commission calendar which is at least 30 days after receipt of the additional traffic study from the Project Sponsor.

Please do not hesitate to call me if you have any questions or concerns. Thank you for your consideration in this regard.

Very truly yours,

Denis F. Shanagher

DFS

cc: Wyntress Balcher
Tom Adams, Esq.
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February 28, 2018

VIA E-MAIL & OVERNIGHT MAIL

Joelle Gallagher, Commissioner
Michael Bayayne, Commissioner
Anne Cottrell, Commissioner
Terry Scott, Commissioner
Jeri Gill, Commissioner
c/o David Morrison, Director
COUNTY OF NAPA PLANNING COMMISSION
1195 Third Street, Suite 210
Napa, CA 94559

Re: 270 Kreuzer Lane – Napa, California
Caldwell Vineyard Use Permit No. P17-00074-MOD
APN Nos.: 045-310-056 and 045-310-055

Dear Commissioners:

This firm represents the Kreuzer Lane Protection Committee (the "KLPC"), a group of concerned property owners on Kreuzer Lane and in the surrounding neighborhood, in connection with the pending Use Permit Major Modification application (the "Project") for Caldwell Vineyards. The KLPC respectfully opposes the Project for the reasons stated herein. Notably, the Project is inconsistent with the Napa County policies regarding incidental uses in an Agricultural Zoning District, and if approved, will mark a major departure from prior County Policy in this regard. Also notably, the significant increases in use associated with the Project have not been adequately studied, particularly in connection with traffic and water impacts. The proposed Negative Declaration is not supported by the facts or law. These issues are discussed in further detail below.

The Project Is Inconsistent with the Napa General Plan

The Caldwell Vineyard Winery is situated on two parcels at the very end of Kreuzer Lane, which is at that point is a private road. The Property is located in an Agricultural Watershed zone, which allows wineries and accessory uses subject to use permit control. To that end, the County has adopted the Winery Definition Ordinance to protect agriculture and open space and to regulate winery development and expansion so as to avoid potential negative environmental effects.

Agricultural Preservation and Land Use Policy AG/LU 1 of the 2008 General Plan states "agriculture and related activities are the *primary* land uses in Napa County" and Land Use Policy AG-LU-2 states that: ""agriculture" is defined as the raising of crops, trees, and livestock; the production and processing of agricultural products; and the related marketing, sales, and other *accessory* uses ... " The property's General Plan land use designation is AWOS (Agriculture, Watershed and Open Space), which allows "agriculture, processing of agricultural products, and single-family dwellings."

As noted above, the Caldwell Vineyard Winery is in an Agricultural Watershed zoning district. While wineries are allowed as conditional uses in such a district, marketing activities and other accessory uses are to remain *incidental* to the main use. As currently proposed, the expansion of winery operations will be such that the marketing and retail component will begin to dwarf the actual production/farming component. Stated another way, if this Project is approved as proposed, the marketing/visitation aspect of the Winery will no longer function as an ancillary component, incidental and clearly subordinate to the main use. Instead, the marketing and retail aspect of the Winery will become equal to or more dominant than its production component. Is that consistent with the 50th anniversary of the Napa County Agricultural Preserve?

No better evidence in that regard is the Winery Comparison Analysis attached to the Planning Department's original submission to the Commission. The so-called "By Appointment Wineries" in Napa County are those to which marketing and retail uses are to be incidental to agricultural use. There are twenty-two (22) such wineries in the 30,000 – 35,000 gallon production category. The average for approved daily/weekly visitors is 18/103. The average for annual approved visitors is 5386, and for marketing visitors is 270. The average number of approved total annual visitors is 5904.

A review of the Caldwell Vineyard application reveals dramatic increases in all categories relative to the average for similar size "by appointment" wineries. The Project application for 60 daily visitors will be *330%* over the average for comparable wineries, *400%* higher for weekly visitors, and will be nearly *four times* the annual average for annual visitors. It will be *three times* higher than the average for approved marketing visitors, and at the requested 22,800, will be nearly *four times* (3.87) the average, and over *four times* (4.23) the median.

These numbers, as well as the fact that the Sponsor is requesting a *773%* increase in annual visitors against a *40%* increase is wine production, demonstrate an intent on the part of the Project Sponsor to make the marketing/visitation aspect of the Caldwell Vineyard Winery no longer function an ancillary component, incidental and clearly subordinate to the main use, but instead an equal or primary use. This is clearly inconsistent with Napa's Agricultural Preservation and Land Use Policy. If the Project is approved at the current numbers, it will send a message throughout Napa County that the Planning Commission has a new approach and position with regard to Napa's Agricultural Preservation and Land Use Policy, and its General Plan.

Stated another way, approval of this application in its current form is in violation of the General Plan and will not properly balance the rights of the individual winery owner with that of the community (i.e the immediate neighbors). The proposed substantial increase in intensity will generate a level of noise, traffic, and activity in what is otherwise a quiet, rural agricultural area that will diminish the quality of life for nearby residents and increase the presence of components that will not enhance the rural residential character but instead will detract from it. To ensure a more balanced approach, following a proper environmental analysis, there needs to be substantial new Conditions of Approval imposed on the Project, including but not limited to demonstrated compliance with the original Conditions of Approval and a sharp reduction in the number of approved visitors to be consistent with Napa's Agricultural Preservation and Land Use Policy and the General Plan.

The Project Requires Environmental Review

The recommendation of the Planning Department is a Negative Declaration with respect to a potential environmental impact. To the contrary, even a cursory or summary review of the Project demonstrates that in several important areas, proper environmental review is required.

By itself, a review of comparison winery approvals discussed above suggests that this Project is a dramatic deviation from prior land use applications in this County, worthy of further study. And a simple calculation of the proposed increases to the prior approval of this Project compels the same conclusion.

Approvals	Current Permit	Proposed Permit	Proposed Increase
Tasting/Touring Visitors (Daily/weekly)	8/40	60/420	750%/1050% Increase
Tasting/Touring Visitors (Yearly)	2,496	21,780	773% Increase
Event Visitors (Yearly)	320	1,040	225% Increase
Annual Events	14	19 (larger)	35% increase (min)
Wine Production	25,000 gallons	35,000 gallons	40% increase
Cave Size	16,970 sq.ft.	21,865 sq.ft.	28.8% increase

Traffic

The Initial Study prepared by the Planning Department curiously relies on a simplistic two-page calculation of traffic flow from a civil engineering firm, and not a traffic consultant. And that calculation does not rely on an actual traffic count. Moreover, the calculation does not appear to properly calculate the traffic impacts of a 773% increase in total wine tasting visitors per year, a 225% increase in special event guests, and an unlimited increase in Custom Crush Producers. Even the PM Peak trip calculation submitted by the Sponsor shows a 5-fold increase in traffic on a one-lane narrow road.

More curiously, the Initial Study improperly attempts to incorporate and rely on an August 24, 2017 traffic study by W-Trans for the Paul Hobbs-Nathan Coombs Winery Project at 2184 Imola Avenue. That traffic study analyzes a project some half-mile and three intersections to the Southwest, *for which there is effectively no projected increase in traffic near Kreuzer Lane*, and so it never properly considers the impact of levels of service at Fourth Avenue and Kreuzer Lane.

In addition, the Paul Hobbs-Nathan Coombs Winery Project discussed in the W-Trans report is for a winery that will have an average of 15 visitors a weekday and 30 per weekend day, 34 daily trips during the weekdays and 43 new trips on Saturday. By contrast, this Project will generate more than *twice* the traffic to be generated by the Paul Hobbs-Nathan Coombs Winery Project, with *five times* more daily visitors. The Initial Study does not look at the cumulative impact of the two projects. And if that analysis was performed, the Level of Service calculations would be dramatically different. The Initial Study makes no acknowledgement in that regard.

In addition, the Initial Study incorrectly concludes that there will not be any left turn movements from a public road, and that a left turn lane will not be necessary, also apparently relying on a sight line analysis from the W-Trans Report. But the sight line analysis from that report did not look at where Fourth Avenue meets Kreuzer lane, and the blind ninety-degree turn of Fourth Avenue at that location. In fact, any new visitors to the Winery from the North and East on Fourth Avenue will need to make a blind left turn. An analysis of the possible need for a left turn lane at that location is essential.

Thus, a proper traffic study should be prepared, with an existing traffic count at the blind curve intersection of Fourth Avenue and Kreuzer Lane which is more than a half mile past the Imola/Fourth Ave. intersection. A sight line analysis and consideration of the need for a left-turn lane should be included in the study, as well as analysis of the intersections of Fourth Avenue and Coombsville Road, and Silverado and Coombsville to the North. The cumulative impacts of the Paul Hobbs-Nathan Coombs Winery Project and this Project need to be considered.

In that regard, and in apparent acknowledgement of the defects and deficiencies in the existing traffic analysis, the KLPC was advised on February 16, 2018, that Caldwell Vineyard, in consultation with the Planning Department, has agreed to prepare an additional Traffic Study for the Project. This was the subject of our letter to the Commission in February 22, 2018, requesting a continuance of the hearing pending receipt of that study. To date, we have not seen the new traffic study, or had a chance to review its contents, and will not have the time to do so before the scheduled hearing. Please be advised that the KLPC intends to hire a traffic consultant to analyze the traffic impacts of the Project, either independently or through a peer review of the promised "additional" traffic study, or both, but for the moment must presume that neither the traffic study or continuance is forthcoming.

There are only 38 existing parking spaces. It is highly unlikely that the 38 existing parking spaces will be sufficient for the nine large events of more than 68 guests (four of which will have more than 100 guests). There is no explanation of how the vaguely-described valet parking solution will address some special event concerns. At a minimum, there needs to be proper description of the large event operations.

Water

The Caldwell Vineyard consists of two separate parcels - a winery parcel and a vineyard parcel. The winery parcel is located in a MST deficient groundwater basin. It is unclear how and in what manner the vineyard parcel will be used for the winery and/or to ensure that the well in the MST ground deficient parcel will not be used beyond its current level, particularly since the water depth of the wells in the MST area is increasing.

Moreover, as the caves exist on both parcels, should the entire winery be considered part of the MST deficient groundwater basin? Is a lot line adjustment necessary to obtain a proper analysis here?

The current water analysis does not study the ability to serve the one annual 200-person special event.

There is no detail provided with regard to the water system in use at the site. For example, what is the age of the system? Is there water service to the sub-buildings?

The Water Availability Analysis reports minimal increases in water use. Further peer review will be necessary with respect to the assumptions and calculations.

Fire

It is not clear how the Fire Department could have approved the Project given that there is no method for a turnaround near the wine caves. The road is simply not wide enough to accommodate a fire-fighting effort in that area.

The Atlas Wildfire of 2017 was a wake-up call for many residents of Napa County, and especially those on rural wildland property such as the area where Caldwell Vineyard Winery and several adjacent residential properties are situated. The Napa County fire marshal's office gave its approval for the major modification before the October, 2017 wildfires. It is suggested that the fire marshal to re-inspect the winery and surrounding location post-fire, before any Project modification is approved.

Note that the neighboring parcel owners at 199 Kreuzer Lane have worked for decades to harden its fire defenses, including a circular driveway that doubles as a firebreak, around the structures within it. Cal Fire came in several times to advise parcel owners on best practices. The preventative measures worked well, assisted by U.S. Forest Service, and Cal Fire. There is still a danger, however: the highly flammable steep canyon separating the 199 Kreuzer Lane property from the Caldwell Vineyard Winery Cave complex. This is the most vulnerable border, and the threat extends to those properties west of the winery.

Wildfire danger caused by and at the Caldwell Vineyard was less of a concern when the Use Permit stipulated that all visitation activities occur within the winery cave, but residents have far greater concern now that an outside picnic area has been requested. A single careless act by any one of the new, potential thousands of tasting and event guests who might be permitted to eat and drink outside the cave area, could spark a wildfire.

Additionally, parking and driving on unpaved areas - a potential fire hazard in fire season - is possible and dangerous because thoroughfares and parking areas below the cave portals are not fenced.

Conditions of Approval

The proposed Conditions of Approval are not stringent enough, given the Project Sponsor's demonstrated inability to abide by the original Conditions of Approval.

Outdoor Activity

According to the current use permit, "no tasks" are authorized outside the caves. The project proposes an outside picnic area. There is a concern in this regard given the border of a high wildfire danger area, is within line of sight and sound of adjacent residences, and would be in operation seven days a week, from 10 am to 6 pm.

Also concerning is unsupervised alcohol consumption implicit in this picnic plan, which would increase the danger of driving up and down the steep cliff-side narrow driveway and past 25 residences, and beyond. There need to be specific monitoring provisions in this regard, including sound-proofing and screened and screening of the picnic area, clearly delineated with an area size included in the use permit, built on a fireproof surface, with an emergency water system, and no outside fires allowed.

The long-roadside screening called for in the original use permit should be installed, rather than the few sparsely-planted trees that are there now.

The loud outdoor pumps and fans that operate 24-hours-a-day, 7 days a week, should be sound-proofed and screened, as called for in the original use permit but never accomplished.

Residences, both facing the Caldwell Vineyard and along Kreuzer Lane, are impacted by outside event noise. There should be no outdoor amplified music or sound, even for temporary events. In connection with the original application, the neighbors were guaranteed by the owner of Caldwell Vineyard that there would be no outside music, but this turned out to be untrue for some events and activities.

Parking

The original use permit specified: "In no case shall parking impede emergency vehicle access on public roads. If any event is held, which will exceed available onsite parking, the Caldwell Vineyard Winery shall arrange for off-site parking and [provide] shuttle service to the winery." That has not occurred. Specific plans for shuttle parking need to be provided to the County and the neighbors.

Summary

The current Project Application is in violation of the General Plan and inconsistent with Napa's Land Use Policy, and must be significantly modified for that reason. It is also respectfully submitted that regardless of the size of the Project, a proper environmental review needs to be conducted in connection with the current Project application, particularly with respect to traffic and water impacts. And if a reduced Project is approved, significant additional Conditions of Approval will be necessary.

Please do not hesitate to call me if you have any questions or concerns. Thank you for your consideration in this regard.

Very truly yours,

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