

Traffic Analysis



August 3, 2016

Mr. Brion G. Wise Sleeping Lady Vineyard 35 East Napa Street, Suite B Sonoma, CA 95476

Traffic Analysis for Sleeping Lady Vineyard

Dear Mr. Wise;

As requested, W-Trans has prepared a traffic analysis relative to the proposed winery and tasting-by-appointment facility to be located at 5537 Solano Avenue in the County of Napa. The purpose of this letter is to address the potential impacts of project-added trips on the roadway network.

Existing Conditions

The study area consists of Solano Avenue, which runs along the frontage of the project site in the County of Napa. Solano Avenue runs generally north-south and is classified as a collector. Along the project frontage, the road has two 12-foot travel lanes. Traffic counts obtained on Solano Avenue between April 14 and 17, 2015, indicate that the roadway is carrying about 1,800 to 2,200 vehicles per day, and the average ADT is 1,930.

Project Description

The proposed project is a new 30,000-gallon per year winery to be located on a 104-acre parcel of land located at 5537 Solano Avenue in the County of Napa. There are two existing residences on the project site (a single family dwelling and a caretaker unit) together with a vineyard. The proposal is to restore and convert a historic barn structure for re-use as a winery producing wine from the fruit grown on-site rather than exporting it. In addition to the winery uses, a hospitality/tasting area within the winery is proposed that would serve 20 visitors on a peak day and 105 guests per week, or an average of 15 visitors per day by appointment only. The winery will have two full-time and two part-time employees during normal operation and two additional part-time employees during harvest. The tasting room will be open seven days per week. Production times as proposed would range from 6:00 a.m. to 6:00 p.m. while tasting hours would be from 10:00 a.m. until 6:00 p.m. Finally, ten winery marketing events per year with up to 30 persons attending are proposed together with two release or wine club events per year with up to 75 persons attending as well as an NVAA event with up to 100 attendees. Events would commence at 6:00 p.m. or later and conclude by 10:00 p.m. Permanent parking for seven vehicles is proposed.

Trip Generation

The County of Napa's Winery Traffic Information/Trip Generation Sheet was used to determine the trip generation for the project proposed. To provide a conservative assessment the peak day visitation was used rather than the average number of daily guests. The County of Napa's Winery Traffic Information/Trip Generation Sheet does not include guidance on inbound versus outbound trips during the peak hours, so it was assumed that two-thirds of trip ends at the winery would be outbound during the weekday p.m. peak hour since most of the trips would be associated with employees and customers leaving at closure of the winery. For the Saturday peak hour it was assumed that inbound and outbound trip ends would be evenly split. The net new trips for the proposed project are shown in Table 1 and a copy of the trip generation worksheet is enclosed.

Table 1 – Trip Ger	neration Summar	у									
Trip Source	Da	aily	1	kday k Ho		Wee Pea	kend ak Ho		Crush Pea	Satuı ık Hot	•
	Weekday	Weekend	Trips	In	Out	Trips	ln	Out	Trips	ln	Out
Employees	10	10	4	1	3	4	2	2	6	3	3
Visitors	15	14	6	3	3	10	5	5	11	5	6
Trucks	1	0	0	0	0	0	0	0	1	1	0
Total	26	24	10	4	6	14	7	7	18	9	9

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

Trip Distribution

Traffic counts obtained on Solano Avenue in 2015 indicate that during the p.m. peak hour traffic volumes southbound are about double those northbound. Over the course of the day and midday, however, volumes are fairly evenly split. Given the volume pattern on Solano Avenue as well as the proximity to protected access to SR 29 either at California Drive in Yountville to the north or Oak Knoll Avenue to the south, it appears likely that project trips will be fairly evenly split, so a 50/50 distribution to the north and south is suggested. While inbound trips will be assigned via Hoffman Lane, it is likely that all outbound trips during peak periods will divert to locations where protected access to the highway is provided.

Roadway Segment Level of Service Methodology

The roadway segment Level of Service methodology found in Chapter 15, "Two-Lane Highways," of the *Highway Capacity Manual* is the basis of the automobile 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.

Solano Avenue was defined as a Class III roadway for the purposes of this analysis. Class III highways are measured by percent of free-flow speed (PFFS), which represents the ability of vehicles to travel at or near the posted speed limit. A PFFS greater than 91.7 percent is indicative of LOS A conditions.

Existing Conditions

The Existing Conditions scenario provides an evaluation of current operation based on existing traffic volumes during the weekday p.m. and weekend midday peak periods. Volume data was collected in April 2015.

The existing and existing plus project traffic volumes on Solano Avenue are summarized in Table 2. The weekend midday peak was evaluated with the trips associated with Crush Saturdays, resulting in a more conservative analysis.

	Existing	Conditions			Existing	plus Project	
PM	Peak	Weekend N	1idday Peak	PM	Peak	Weekend M	1idday Peal
NB	SB	NB	SB	NB	SB	NB	SB
94	119	74	106	97	121	78	111

Notes: NB = Northbound; SB = Southbound

Roadway Segment Levels of Service

Under existing conditions, the roadway operates acceptably at LOS A during both peak periods in either direction. The roadway is expected to continue to operate at LOS A during both peak periods upon the addition of project added traffic. A summary of the roadway segment level of service calculations is shown in Table 3, and copies of the Level of Service calculations are enclosed.

Table 3	– Exi	sting an	d Exis	sting plu	ıs Pro	ject Pea	k Ho	ur Inters	ection	ı Levels	of Se	rvice on	Sola	no Aven	ue
		Exis	ting C	onditio	ns					Exist	ing p	us Proje	ect		
	PM	Peak		Week	end M	lidday P	eak		PM F	Peak		Week	end M	1idday F	eak
NE	3	SE	3	NE	3	SB	3	NE	3	SE	3	NE	3	SE	3
PFFS	LOS	PFFS	LOS	PFFS	LOS	PFFS	LOS	PFFS	LOS	PFFS	LOS	PFFS	ĻOS	PFFS	LOS
95.1%	Α	95.6%	Α	94.6%	Α	96.1%	Α	94.9%	Α	95.4%	Α	95.2%	Α	95.9%	Α

Notes: NB = Northbound; SB = Southbound; PFFS = Percent Free Flow Speed; LOS = Level of Service

It should be noted that with the addition of project-related traffic volumes, the Percent Free Flow Speed decreases during both peak hours except for the southbound direction during the p.m. peak hour. This reflects the expected condition wherein having slightly more traffic results in a slightly increased potential for drivers to have their speed dictated by another driver in front of them. While the slight increase in the southbound PFFS during the p.m. peak hour is counter-intuitive, this result is likely due to rounding within the software that falls in one direction for existing volumes and the other direction for plus project. The conclusion could incorrectly be drawn that the project actually improves operation based on this data alone; however, it is more appropriate to conclude that drivers will experience little, if any, change in conditions as a result of the project.

Finding – The study segment is expected to continue operating acceptably at LOS A during both peak periods upon the addition of project-generated traffic to existing volumes.

Cumulative Conditions

Cumulative operating conditions were determined by adding trips that will be generated by other approved and pending projects to the segment of Solano Avenue in the vicinity of Sleeping Lady Vineyard to existing volumes. As directed by County staff, the following projects were included to evaluate Cumulative Conditions.

- Chanticleer Winery new winery with 10,000 gallons of production and tasting by appointments only at 4 Vineyard View Drive
- McVicar Winery new winery to be located at 6155 Solano Avenue, proposing 20,000 gallons of production
- Burgess Napa Cellars winery with 75,000 gallons of production at 5445 Solano Avenue

- Darms Lane new winery producing 30,000 gallons of wine and tasting by appointments only at 1150
 Darms Lane
- Oak Knoll Hotel 50-room hotel at 5091 Saint Helena Highway

The traffic volumes on the study segment under cumulative and cumulative plus project conditions are summarized in Table 4. Some visitors to Sleeping Lady Vineyard would be expected to visit multiple wineries during their time in Napa Valley, including those wineries included in the list of approved projects, but all of these trips were conservatively added as if single-purpose new trips.

	Cumulat	ive Conditions			Cumulati	ive plus Project	
PM	Peak	Weekend M	1idday Peak	PM I	Peak	Weekend M	lidday Peak
NB	SB	NB	SB	NB	SB	NB	SB
111	129	92	123	114	131	96	128

Notes: NB = Northbound; SB = Southbound

Under cumulative conditions, Solano Avenue is expected to operate acceptably at LOS A in either direction, with or without project-added trips, as shown in Table 5.

Table 5	– Cui	mulative	and	Cumula	tive p	lus Proj	ect Pe	ak Hou	r Inte	rsection	LOS	on Solar	io Ave	nue	
		Cumu	lative	Condit	ions	•				Cumu	lative	plus Pr	oject		
	PM	Peak		Week	end M	1idday P	eak		PM	Peak		Week	end M	lidday F	'eak
NE	3	SE	3	NE	3	SE	3	NE	3	SE	3	NE	3	SE	3
PFFS	LOS	PFFS	LOS	PFFS	LOS	PFFS	LOS	PFFS	LOS	PFFS	LOS	PFFS	LOS	PFFS	LOS
94.4%	Α	94.8%	Α	94.4%	Α	95.1%	Α	94.2%	Α	94.6%	Α	94.1%	Α	94.9%	Α

Notes: LOS = Level of Service; PFFS = Percent Free Flow Speed; LOS = Level of Service

Finding – The study segment is expected to continue operating acceptably at LOS A during both peak periods upon the addition of traffic associated with the project as well as other approved and pending projects.

Future Conditions

Segment volumes for the horizon year of 2030 were obtained from the County's gravity demand model. There is no information for Solano Avenue in the vicinity of the project site, so a growth factor of 1.37 was calculated based on 2010 and 2030 model volumes for SR 29 and applied to existing volumes to arrive at future volumes.

Table 6 shows the projected future and future plus traffic volumes on Solano Avenue near the project site achieved through application of the growth factor.

	Future	Conditions			Future p	olus Project	
PM	Peak	Weekend M	lidday Peak	PM I	Peak	Weekend M	idday Peak
NB	SB	NB	SB	NB	SB	NB	SB
28	162	101	145	131	164	105	150

Notes: NB = Northbound; SB = Southbound

Under projected future volumes, the roadway study segment is expected to operate acceptably at LOS A during both peak periods and in either direction, with or without the addition of project-generated traffic. These results are summarized in Table 7.

Table 7	– Fut	ture and	Futu	re plus F	rojec	t Peak H	lour l	ntersect	ion L	evels of	Servi	ce on So	lano	Avenue	
		Fut	ture C	onditions				Fut	ure pi	us Proje	ct				
	PM	Peak		Week	end M	1idday F	Peak		РМ	Peak		Week	end M	1idday F	^P eak
NE	3	SI	В	NE	3	SE	3	NE	3	S	В	NB S			3
PFFS	LOS	PFFS	LOS	PFFS	LOS	PFFS	LOS	PFFS	LOS	PFFS	LOS	PFFS	LOS	PFFS	LOS
92.7%	Α	93.5%	Α	93.3%	Α	94.3%	Α	92.5%	Α	93.3%	Α	93.0%	Α	94.1%	Α

Notes: LOS = Level of Service; PFFS = Percent Free Flow Speed; LOS = Level of Service

Finding – The study segment is expected to continue operating acceptably at LOS A in both directions during both peak periods with project traffic added to potential Future volumes.

Project Impact to SR 29 Intersections

Further analysis was completed to determine if the project would have a significant impact on SR 29 using Napa County's Guidelines for Interpretation of General Plan Circulation Policies on Significance Criteria, published on December 1, 2015 by Fehr & Peers. The document establishes thresholds of significance for road segments and different intersection control types. The memorandum states a project would cause a significant impact requiring mitigation if, for existing conditions: An unsignalized intersection operates at LOS A, B, C, or D during the selected peak hours without Project trips, the LOS deteriorates to LOS E or F with the addition of Project traffic, and the peak hour traffic signal warrant criteria is met.

As noted in the trip distribution, it was assumed that the only trips at SR 29/Hoffman Avenue would be inbound, southbound right-turns, which would be expected to have an imperceptible impact on operation of SR 29/Hoffman Avenue. All other visitors and employees would access the project site from intersections with protected access to the highway which are located to the north at California Avenue and south at Oak Knoll Avenue. Because the project is expected to add trips only to movements that have little to no delay and none to the critical left-turn movements, the impact on operation is expected to be less-than-significant.

Further, a project would cause a significant impact requiring mitigation if, for cumulative (future) conditions, the Project's volume is equal to, or greater than five percent of the difference between cumulative (future) and existing volumes. The growth factor derived from the Napa-Sonoma Model was applied to existing volumes at SR 29/Hoffman Lane. The project contributes less than one-half of one percent of the difference between existing and future volumes, and therefore has a less-than-significant impact under the criteria applied.

Access Analysis

The project site will be accessed via a single driveway on Solano Avenue.

Left-Turn Lane Warrants

The need for a left-turn lane on Solano Avenue at the project driveway was evaluated based on criteria contained in the *Napa County Road and Street Standards*, 2011. Solano Avenue has an approximate ADT volume of 1,930 vehicles.

Using the County's criteria, for an average daily traffic volume of approximately 1,930 vehicles on Solano Avenue and the proposed daily new trips at the Solano Avenue driveway, a left-turn lane is not currently warranted on Solano Avenue at the driveway serving the project site.

Future projected traffic volumes were estimated using the growth factor of 1.36. The estimated future ADT on Solano Avenue near the project driveway is 2,625 vehicles per day. Under these projected future volumes, a left-turn lane would still not be warranted on Solano Avenue at the project driveway. A copy of the warrant graph indicating both existing and future conditions is enclosed.

While turn lanes are not needed to accommodate project-generated traffic, the conditions during a special event were also taken into account. AASHTO's *Geometric Design of Highways and Streets* indicates that the hourly traffic volume used in design should not be exceeded very often. To avoid facilities with excessive capacities, AASHTO recommends that designs be based on volumes during the 30th highest hour. Since the proposed project results in added trips due to 100-person special events only once per year, this scenario is not appropriate for evaluation purposes. Further, it is unlikely that events will begin during the peak hours evaluated, but rather, they are more likely to begin and end during off-peak hours.

Finding – A left-turn lane is not warranted at the project driveway.

Conclusions and Recommendations

- The proposed project would be expected to generate an average of 26 daily trips, including 10 trips during the weekday p.m. peak hour, 14 trips during the weekend midday peak hour, and 18 trips during a Crush Saturday peak hour.
- A total of 13 special events are proposed, with the largest special event having 100 attendees and occurring once per year. The remaining 11 events would have 30 to 75 attendees.
- Solano Avenue currently operates at LOS A under existing conditions. Solano Avenue is expected to continue operating at LOS A under cumulative and future conditions, as well as with project-added traffic.
- The project would have a less than significant impact on intersections along SR 29.
- A left-turn lane is not warranted at the project driveway.

TR001552

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

Sincerely,

Lauren Davini, EIT Assistant Traffic Engineer

Dalene J. Whitlook, PE, PTOE

Principal

DJW/lgd/NAX095.L1

Enclosures: Winery Trip Generation Form

Roadway Level of Service Calculations

Turn Lane Warrants

Winery Traffic Information / Trip Genera	tion	Sheet	
Project Name: Sleeping Lady Vineyards Winery Project Scenario:		Proposed	
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: 2 x 1.90 one-way trips per employee	=	4	daily trips
Average number of weekday visitors: 20 / 2.6 visitors per vehicle x 2 one-way trips	=	15	daily trips
Gallons of production: 30000 / 1,000 x .009 truck trips daily 3 x 2 one-way trips	=	1	daily trips
Total	=	26	daily trips
Number of total weekday trips x .38		10	PM peak trips.
Traffic during a Typical Saturday			
Number of FT employees (on Saturdays): 2 × 3.05 one-way trips per employee	=	6	daily trips
Number of PT employees (on Saturdays): 2 × 1.90 one-way trips per employee		4	daily trips
Average number of weekend visitors: 20 / 2.8 visitors per vehicle x 2 one-way trips		14	daily trips
Total		24	daily trips.
Number of total Saturday trips × .57		14	PM peak trips.
Traffic during a Crush Saturday			
Number of FT employees (during crush): × 3.05 one-way trips per employee		6	daily trips
Number of PT employees (during crush): x 1.90 one-way trips per employee	*	8	daily trips
Average number of weekend visitors: 20 / 2.8 visitors per vehicle x 2 one-way trips	=	14	daily trips
Gallons of production: 30000 / 1,000 x .009 truck trips daily x 2 one-way trips	=	1	daily trips.
Avg. annual tons of grape on-haul:x .11 truck trips daily ⁴ x 2 one-way trips	=	3	daily trips
Total	=	31	daily trips.
Number of total Saturday trips x .57	=	18	PM peak trips.
Largest Marketing Event- Additional Traffic			
Number of event staff (largest event): 5 x 2 one-way trips per staff person	=	10	trips.
Number of visitors (largest event):/ 2.8 visitors per vehicle × 2 one-way trips	=	71	trips.
Number of special event truck trips (largest event): x 2 one-way trips	-	8	trips.

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

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REVISED 06/08/2015

Note: as a member of the NVVA this applicant is entitled to an Action Napa Valley event under their Master Use Permit. This event has an allowed attendance of 100 persons, and while this applicant would almost certainly have a smaller number, estimated at 75 visitors, the larger attendance was conservatively used for analysis purposes.

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).

Fax: Directional Two-Lane Highway Segment Analysis	PCE for truck PCE for krs, PCE for Rvs, Heavy-vehicle Grade adjustm Directional f Base percent Adjustment fo Percent time-
Analyst Agency/Co. Napa County Date Performed 7/184 Highway Highway From/Tor Nordiction Analysis Year Description Existing NB Conditions Input Data Input Data	Level of serv Volume to cap Peak 15-min v Peak Hour veh Peak Lis-min L Capacity from Capacity from Directional C
Highway class Class 3 Shoulder width 7.0 ft % Trucks and buses 5 Lane width 1.0 mi Truck crawling 0.0 % Terrain type 1.0 mi % No-passing zones 0.0 % Grade: Length - evel mi % No-passing zones 5 Up/down - % Analysis direction volume, Vo 199 veh/h	Total length Length of two Length of pas Average trave Percent time- Level of serv
Direction PCE for trucks, ET PCE for trucks, ET PCE for trucks, ER PCE for trucks, ER PCE for No, ER PCE for trucks, ER PCE for No, ER PCE fo	length of Length of two Ladj. factor f Adj. factor f on averag Average trave Percent free
Free-Flow Speed from Field Measurement: Field measured speed, (note-3) S FM Observed total demand, (note-3) V Estimated Free-Flow Speed: 98 BFFS Adj. for lane and shoulder width, (note-3) fLS 0.0 mi/h Adj. for access point density, (note-3) fR 1.0 mi/h Free-Flow speed, FFSd 49.0 mi/h	Downstream le of passin Length of two the passin Adj. factor f on percen Percent time- including
Adjustment for no-passing zones, fnp 0.5 mi/h Average travel speed, ATSd Percent Free Flow Speed, PFFS 95.1 %	Level o Level of serv Peak 15-min t

	1.00	pc/h
ce and Other Perform	es	
v/c		
of travel, VMT15 26	veh-mi	
	veh-mi	
1635	veh/h	
Capacity from PTSF, CdPTSF 1692 vv Directional Capacity 1635 vc	veh/h	
Passing Lane Analysis		
Total length of analysis segment, Lt	1.0	mi
-C		mi
igth of passing lane including tapers, Lpl	1	mi
	46.6	mi/h
Level of service, Losd (from above)	19.0	
Average Travel Speed with Passing Lane		
Downstream length of two-lane highway within effective length of passing lane for average travel speed, Ide		mi
of the passing l	ı.	mi
on average speed, fpl	-	
speed		
	0.0	NO.
Percent Time-Spent-Following with Passing Lane	le le	
Downstream length of two-lane highway within effective length of passing lane for percent time-enemt-following Ide		
Length of two-lane highway downstream of effective length of		
passing lane for percent time-spent-following, Ld	1	mi
on percent time-spent-following, fpl		
including passing lane, PTSFpl	1	dip
Level of Service and Other Performance Measures with Pa	Daning	Lane

Phone: E-Mail:		
Directional Two-Lane Highway Segment	t Analysis	
Analyst Agency/Co. Apa County Date Performed Analysis Time Period Weekday PM Peak Highway From/To Jurisdiction Analysis Year Description Existing SB Conditions		
Peak hour fac % Trucks and % Trucks crawl Truck crawl s % Recreationa % Recreationa Acroess point veh/h	PHF s hicl s ity	mi/i/mi/mi
ysis (d) 2.0* 1.0 0.952 1.00	Opposing (o) 2.0* (1.00 0.952 1.00 pc/h 1.07	(o) bc/
Free-Flow Speed from Field Measurement: Field measured speed, (note-3) S FM Observed total demand, (note-3) V Estimated Free-Flow Speed: Base free-flow speed, (note-3) BFFS Adj. for lane and shoulder width, (note-3) fLS 0.0 Adj. for access point density, (note-3) fA 1.0 Free-flow speed, FFSd Adjustment for no-passing zones, fnp Adjustment free Flow Speed, ATSd Percent Free Flow Speed, PFFS 95.6	mi/h weh/h mi/h mi/h mi/h mi/h mi/h	

0.995 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0	0.995 1.00 130 4) BPTSFG 14.8 % 103 1.00 13.2 % er Performance Measures 15.1 % e.00 15 % e.00 16.2 % e.00 16.2 % e.00 16.2 % e.00 16.2 % e.00 16.3 % e.00 16.2 % e.00 16.3 % e.00 16.2 % e.00 16.3 %
her Performance Measures A 0.08 0.08 119 veh-mi 1027 veh/h 1627 v	T15 T15 0.08 0.08 0.7 0.7 0.7 0.7 0.7 0
T15 32 veh-mi 10 veh-mi 0.7 veh-h 1692 veh/h 1692 veh/h 1627 veh/h	T15 32 veh-mi 119 veh-mi 119 veh-h 1627 veh/h 1629 veh/h 1627 veh/h 1629 veh/h 1627 veh/h 1628 veh/
0 0.7 veh-mi 0.7 veh-h 1627 veh/h 1692 veh/h 1627 veh/h ne Analysis	on 119 veh-mi 1627 veh/h 1627 veh/h 1627 veh/h 1627 veh/h 1627 veh/h 1627 veh/h 1627 veh/h 1.0 mi 46.9 mi 46.9 mi 46.9 mi 46.9 mi 46.9 mi 46.9 mi 23.8 mi travel speed, Ide — mi ge travel speed, Ide — mi age travel speed, Id — mi ane ArSpl — — mi ane travel speed, Id — mi ane travel speed, Id — mi ane inthin effective length — mi feffective length of — mi feffective length of — mi feffective length of — mi feffective length of — mi
Lane Analysis	the passing lane, Lu - mi ', Lpl - 46.9 mi om above) with Passing Lane - mi feffective - mi effective - mi effective - mi age travel speed, Lid - mi and thin effective length of the following, Lid - mi effective length of mi effective length of mi effective length of mi and
the passing lane, Lu - mi, Lpl - mi om above) 23.8	the passing lane, Lu - mi , Lpl om above) 23.8 with Passing Lane travel speed, Lde - mi f effective age travel speed, Ld - mi ane, ATSpl - mi ane, ATSpl - mi ane, ATSpl - mi ane inthin effective length of the collowing, Lde - mi f effective length of mi
	tive d, Lde choice fixe frye choice
	ng Lane length de th of Ld
lane highway within effective e for average travel speed, Lde y downstream of effective lane for average travel speed, Ld - t of passing lane	ng Lane length de - th of Ld -
tive d, Lde speed, Ld	length de - jth of - Ld -
d, Lde cspeed, Ld	r ı
tive d, Lde speed, Ld FSpl 0.0 Passing Lane tive length ng, Lde	

DOR for trucks FT	Analysis(d)	Opposing	(0)
	0	1.0	
fHV	1 00	0.995	
1 00	bc	151	pc/h
Base percent time-spent-following, (note-4) B Adjustment for no-passing zones, fnp	BPTSFd 10.2	oρ	
ercent time-spent-following, PTSFd	16.0	dip	
Level of Service and Other P	Performance Me	Measures	
Level of service, LOS	A C		
Peak 15-min vehicle-miles of travel, VMT15	22.03	veh-mi	
	74	veh-mi	
min total travel time, TT15	0.5	veh-h	
Capacity from AIS, CARIS Capacity from PTSF, CAPISE	1692	veh/h	
Directional Capacity	1642	veh/h	
Passing Lane An	Analysis		
otal length of analysis segment. Lt		1.0	mi
Length of two-lane highway upstream of the p	assing lane,	Lu -	mi
of passing lane including tapers, Lpl		1	mi
Average travel speed, ATSd (from above) Percent time-spent-following, PTSFd (from above)	OVE)	16.0	mi/h
of service, LOSd (from above)		A	
Average Travel Speed with	n Passing Lane	ne	
Downstream length of two-lane highway within elength of passing lane for average travel	effective l speed, Lde		mi
In or two-lane highway downstream of effective length of the passing lane for average travel speed. Factor for the effect of passing lane	ective ravel speed,	rd -	mi
on average speed, fpl			
Average travel speed including passing lane, ATSpl Percent free flow speed including passing lane, PF	ATSpl ne, PFFSpl	0.0	010
Percent Time-Spent-Following with Passing	with Passing	g Lane	
Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Lde	effective loollowing, Ld	ength e	mi
	ective length following, Ld	d of	mi
int time-		1	
including passing lane, PTSFpl		í	00
Government of Sarvice and Other Derformance Measures with Deseins	Masonnocom		0 0 0 0

Bicycle Level of Service

Analyst Agency/Co. Bate Performed Analysis Time Period Highway From/To Jurisdiction Analysis Year Analysis Year Description Existing SB
Existing
Highway class Class 3 7.0 Lane width 12.0 Segment length 1.0 Terrain type Level Up/down Up/down Chalysis direction volume, Opposing direction volume,
Direction PCE for trucks, ET PCE for tvs, ER Heavy-vehicle adj. factor, (note-5) Grade adj. factor, (note-1) fg Directional flow rate, (note-2) vi
Free-Flow Speed from Field Measurement: Field measured speed, (note-3) S FM Observed total demand, (note-3) V Base free-Flow Speed: Base free-flow speed; Adj. for lane and shoulder width, (note-3) Adj. for access point density, (note-3) fA Free-flow speed, FFSd Adjustment for no-passing zones, fnp

PCE for trucks, ET 1.1	
ry-vehicle adjustment factor, fHV 0.995	
1.00	nc /h
pc/n	DC/ 11
16.0	
3Fd	
Level of Service and Other Performance Measures	
Level of service, LOS	
e to capacity ratio, v/c 0.08	
31	
Peak-hour vehicle-miles of travel, VMT60 106 veh-mi	
1627	
Capacity from PTSF, CdPTSF	
Passing Lane Analysis	
	mi
Length of two-lane highway upstream of the passing lane, Lu	mi
, upi	mi/h
Average travel speed, Also (Irom above) Percent time-spent-following, PTSFd (from above) 23.6	11 / 711
evel of service, LOSd (from above)	
Average Travel Speed with Passing Lane	
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Level of Service and Other Performance Measures with Passing	Lane
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Percent Time-Spent-Following

pc/h mi/hr /mi Opposing (o) 2.0* 1.0 0.952 1.00 139 po 50.00 Directional Two-Lane Highway Segment Analysis Peak hour factor, PHF 6 Trucks and buses Trucks crawling 6 Truck crawl speed 6 Recreational vehicles 2 No-passing zones Access point density 4 mi/h mi/h mi/h mi/h mi/h mi/h pc/h 49.0 0.6 Analysis (d) 2.0* 1.0 IV 0.952 1.10 II.2 I Average Travel Speed Solano Avenue near 5537 Solano Avenue County of Napa Free-Flow Speed from Field Measurement:
Field measured speed, (note-3) S FM
Observed total demand, (note-3) V
Estimated Free-Flow Speed:
Base free-flow speed, (note-3) BFFS
Adj. for lane and shoulder width, (note-3) fLS
Adj. for access point density, (note-3) fA veh/h Fax: Input Data Jurisdiction County of Napa Analysis Year 2016 Description Exist Plus Proj NB Conditions W-Trans Napa County 7/18/16 Weekday PM Peak PCE for trucks, ET
PCE for RVs, ER
Heavy-vehicle adj. factor, (note-5) fHV
Directional flow rate, (note-2) vi Adjustment for no-passing zones, inp Average travel speed, ATSd Percent Free Flow Speed, PFFS Vd 98 Vo 122 Class 3 7.0 12.0 1.0 Level mi Analysis direction volume, Opposing direction volume, Free-flow speed, FFSd Agency/Co. Date Performed Analysis Time Period Lane width Segment length Terrain type Grade: Length Up/down Highway class Shoulder width Direction Phone: E-Mail: Analyst Highway

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Phone: E-Mail:

Fax:

__ Directional Two-Lane Highway Segment Analysis__

Analyst
Agency/Co.
Agency/Co.
T/18/16
Analysis Time Period
From/To
Virisdiction
Analysis Year
Description Exist Plus Proj SB Conditions

Input Data

Terrain type Terrain type Grade: Length Grade: Length Whosping direction volume, Vo 98 Veh'h Truck crawl speed % Recreational vehic. % Recreational vehic. % Access point density Analysis direction volume, Vo 98 Veh/h	ruck crawl speed 0.0 Recreational vehicles 2
Vd 122 Vo 98	ng zones 5 nt density 4
Average Travel Speed	eq

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pc/h

Opposing (o) 1.1 1.0 0.995 1.00 131 pc

Segment Analysis
Description Exist Plus Proj NB Conditions

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Phone: Fax: E-Mail:		
Directional Two-Lane Highway S	Segment Analysis	
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Analysis Time Period Weekend Midday		
From/To		
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r. 2016		
Description Exist Plus Proj SB Conditions		
Input Data		
Peak hour	factor, PHF 0.85	
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12.0 ft %	.0	
ent length 1.0 mi Truck cra	0.0	11/
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Grade adj. factor, (note-1) fg 1.00 Directional flow rate, (note-2) vi 137	pc/h 96 p	pc
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Field measured speed, (note-3) S FM	- mi/h	
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Percent Time-Spent-Following

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Control and Control to the control t			Service and Other Performance Measures with Passing

Bicycle Level of Service

Analyst N=Trans N=Trans N=Gment Analysis Agency/Co. Napa County Date Performed 7/18/16 N=Peak Analysis Time Period Weekday PM Peak	Heavy-vehicl Grade adjust Directional Base percent
ormed Time Period	Adjustment f Percent time
ion Year on Exist Plus	Level of ser Volume to ca Peak 15-min Peak-hour ve Peak 15-min Capacity fro Capacity fro Directional
Highway class Class 3 Peak hour factor, PHF 0.92 Shoulder width 7.0 ft % Trucks and buses 5 % Lane width 12.0 ft % Trucks crawling 0.0 % Segment length 1.0 mi Truck crawl speed 0.0 mi/hr Terrain type Level % Recreational vehicles 2 % Terrain type In Mi No-bassing zones 5 %	Total length Length of tw Length of pa Length of pa Average trav
A	Level of ser
Direction PCE for trucks, ET 1.0 Heavy-wehicle adj. factor, (note-5) fHV Directional flow rate, (note-2) vi 127 pc/h pc/h	length o Length of tw length of tw Adj. factor Adj. factor Average travy Percent free
Free-Flow Speed from Field Measurement: Field measured speed, (note-3) S FM Observed total demand, (note-3) V Estimated Free-Flow Speed, Base free-Flow speed (note-3) BFFS Adj. for lane and shoulder width, (note-3) fLS 0.0 mi/h Adj. for access point density, (note-3) fA 1.0 mi/h	Downstream 1 of passi Length of tw the pass Adj. factor
Free-flow speed, FFSd 49.0 mi/h	Percent time including
Adjustment for no-passing zones, fnp 0.6 mi/h Average travel speed, ATSd 46.2 mi/h Percent Free Flow Speed, PFFS 94.4 %	Level of ser Peak 15-min

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rate, (note-2) vi -spent-following, (note-4) -passing zones, fnp t-following, PTSFd	00 00 1141	pc/h
Level of Service and Other Performs	easures	
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ngth of two-lane highway upstream of the passing lane, noth of passing lane including tapers. Lol	Lu I	III.
Average travel speed, ATSd (from above)	46.2	mi/h
Percent time-spent-following, PTSFd (from above)	21.6	
or service, Losd (from above)	A	
ne highway within effective		
ing lane for average travel	1	mi
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eam length of two-lane highway within effective passing lane for percent time-spent-following,	length	mi
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tor for the effect of passing lane	3	TIME
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Level of Service and Other Performance Measures w	with Passing	Lane
Level of service including passing lane, LOSpl E Peak 15-min total travel time, TT15	veh-h	

	Segment Analysis			factor, PHF 0.92 scrawling 0.0 swl speed 0.0 mi/hr	zones density	d) Opposing (o) 2.0* 1.0 1.0 0.952 1.00 pc/h 127 pc/h	- mi/h - veh/h 50.0 mi/h 0.0 mi/h
Phone: Fax:	Directional Two-Lane Highway S	ed Period	Description Exist Flus Appr 56 Conditions	Highway class 3		Direction PCE for trucks, ET 2.0* PCE for RVs, ER 1.0 Heavy-wehicle adj. factor, (note-5) fHV 0.952 Directional flow rate, (note-2) vi 1.00	Free-Flow Speed from Field Measurement: Field measured speed, (note-3) S FM Observed total demand, (note-3) V Estimated Free-Flow Speed: Base free-flow speed, (note-3) BFFS Adj. for lane and shoulder width, (note-3) FLS

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Bicycle Level of Service

Phone	Direction PCE for trucks, ET PCE for RVS, ER Heavy-vehicle adjustm Grade adjustment fact
: Directional Two-Lane Hi	Directional flow rate Base percent time-spe Adjustment for no-pas Percent time-spent-fo
Analyst Agency/Co. Napa County Date Performed 7/18/16 Nahalysis Time Period Weekend Midday Highway From/To near 5537 Solano Avenue County of Napa Dataysis Year 1016 Napa Napa Napa Napa Napa Napa Napa Nap	Level of service, LOS Volume to capacity ra Peak 15-min vehicle-m Peak hour vehicle-mil Peak 15-min total tra Capacity from ATS, Cd
3	
Highway class Class 3 Peak hour factor, PHF 0.85 Shoulder width 12.0 ft % Trucks and buses 5 % Lane width 1.0 mi % Truck crawling 0.0 % Truck crawling 0.0 mi/hr Segment length 1.0 mi % Recreational vehicles 2 % Grade: Length - % Access point density 4 /mi	Total length of analy Length of two-lane his Length of passing lan Average travel speed, Percent time-spent-fo Level of service, LOS
Analysis direction volume, Vd 92 veh/h Opposing direction volume, Vo 123 veh/h	Av
Average Travel Speed	Downstream length of length of passing
Direction PCE for trucks, ET $2.0*$ Opposing (o) $2.0*$ $2.0*$ $2.0*$ $2.0*$ $2.0*$ $2.0*$ $2.0*$ Heavy-vehicle adj. factor, (note-5) fHV 0.952 0.952 0.952 Grade adj. factor, once-1) fg 1.00 1.00 1.00 Directional flow rate, (note-2) vi 114 pc/h 152 pc/h	Length of two-lane hi length of the pas Adj. factor for the on average speed, Average travel speed Percent free flow spe
Free-Flow Speed from Field Measurement: Field measured speed, (note-3) S FM - weh/h Estimated Free-Flow Speed, (note-3) BFFS 50.0 mi/h Adj. for lane and shoulder width, (note-3) fLS 0.0 mi/h Adj. for access point density, (note-3) fA 1.0 mi/h	Downstream length of of passing lane f Length of two-lane hi the passing lane Adj. factor for the eon percent time-s
Free-flow speed, FFSd 49.0 mi/h	Percent time-spent-ro including passing
Adjustment for no-passing zones, fnp 0.7 mi/h Average travel speed, ATSd 46.3 mi/h Percent Free Flow Speed, PFFS 94.4 %	Level of Servic Level of Service incl Peak 15-min total tra

Level of Service and Other Performance Measures olume to capacity ratio, v/c eak 15-min whichermiles of travel, VMT15 eak 15-min total travel time, TT15 eak 16-min total travel time time, TT15 eak 16-min total time, TT15 eak 16-min	Level of Service and Other Performance Measures service, LoS ocapacity ratio, v/c in vehicle-miles of travel, VMT15 in vehicle-miles of travel, VMT10 ocapacity action of travel, VMT10 in vehicle-miles of travel, VMT10 ocapacity ocapacity from PTSP, CdPTS from PTSP, CdPTS from PTSP, CdPTSF from PTSP, CdPTSF from PTSP, CdPTSF passing lane highway upstream of the passing lane, Lu - ravel speed, ATSG (from above) inme-spent-following, PTSPG (from above) Average Travel Speed with Passing lane Average Travel Speed with Passing lane Average Travel Speed with Passing lane Average Travel Speed, Lde two-lane highway within effective h of the passing lane for average travel speed, Ld - cor for the effect of passing lane, ATSpl ocapacity Percent Time-Spent-Following within effective length of erace speed, fpl ravel speed including passing lane, ATSpl Percent Time-Spent-following, Ld - cor for percent time-Spent-following, Ld - cor for percent time-Spent-following, Ld - cor for the effect of passing lane for for the effect of passing lane assing lane for percent time-Spent-following, Ld - cor for the effect of passing lane for for the effect of passin	Date cloud I LOW Fate, (NOCe-2) V1 Base percent time-spent-following, (Note-4) BPTSFG 12.6 Adjustment for no-passing zones, fnp Percent time-spent-following, PTSFG 19.6	0.00 1.00 145	pc/h
y WMT15 y 7 veh-mi y 1642 veh-mi 1642 veh/h 1643 veh/h 1644 veh/h 1645 veh/h 1650 veh/h 1645 veh/h 165 veh/h 1645 veh/h 1646 veh/h 1645 veh/h	service, LOS o capacity ratio, v/c in vehicle-miles of travel, VMT15 in vehicle-miles of travel, VMT15 trom ATS, CGATS from ATS, CGATS in capacity Passing lane Analysis gth of analysis segment, Lt two-lane highway upstream of the passing lane, Lu ravel speed, ATSG (from above) in espent-following, PTSPG (from above) Average Travel Speed with Passing lane Average Travel Speed with Passing lane h of passing lane for average travel speed, Ld Average Travel Speed with Passing lane h of passing lane for average travel speed, Ld crof passing lane for average travel speed, Ld h of the passing lane for average travel speed, Ld crof passing lane for average travel speed, Ld h of the passing lane for average travel speed, Ld crof to the passing lane for average travel speed, Ld crof for the effect of passing lane, ATSpl ravel speed including passing lane, ATSpl ref flow speed including passing lane, ATSpl Percent Time-Spent-Following, Ld crof for passing lane passing lane for percent time-Spent-following, Ld crof for the effect of passing lane crof for	of Service and Other	(1)	
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Phone: E-Mail:	Fax:				
Directional	ional Two-Lane Highway	Segment	Analysis		
Analyst Agency/Co. Date Performed Analysis Time Period Highway From/To Jurisdiction Description Exist Plus	W-Trans Napa County 7/18/16 Weekend Midday Solano Avenue near 5537 Solano County of Napa 2016 Appr SB Condition	Avenue is ata			
lass Clas width h h h h h h h h h h h h h h h h h h	ft ft ft mi mi % %	ctor, buse wling speed al ve zone dens	PHF 0.85 s 0.0 hicles 2 s 4	mi/hr/mi/mi	
Opposing direction volume, Direction PCE for trucks, ET	Average Travel	Speedysis(d)	Opposing 2.0*	(0)	
lj. or, ((note-5) fHV fg e-2) vi	1.0 0.952 1.00 152 pc/h	1.0 0.952 1.00 114	pc/h	
Free-Flow Speed from Field Measurement: Field measured speed, (note-3) S EM observed total demand, (note-3) V Estimated Free-Flow Speed: Base free-flow speed, (note-3) BFFS Adj. for lane and shoulder width, (note-Adj. for access point density, (note-3)	3) fA	50.0 fLS 0.0	mi/h veh/h mi/h mi/h mi/h		
Free-flow speed, FFSd Adjustment for no-passing ' Average travel speed, ATSd Percent Free Flow Speed, Pl	ng zones, fnp .TSd , PFFS	49.0 0.3 46.6 95.1	mi/h mi/h %		

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	1.0	
ijustment factor, fHV	0.995	
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ing, (note-4) BPTSFd	gio	
Adjustment for no-passing zones, fnp 16.8 Percent time-spent-following, PTSFd 25.9		
Level of Service and Other Performance Measures	nres	
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e to capacity ratio, v/c	-	
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Peak-hour vehicle-miles of travel, VMT60 123	ven-mi	
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Passing Lane Analysis		
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length of passing lane including tapers, Lpl	9 9 7	mi/h
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Level of service, LOSd (from above)	А	
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Level of service including passing lane, LOSpl E	veh-h	
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Segment Analysis_	Ψ	PHF s hicles s ity	ed	oppo pc/h	- mi/h - veh/h 50.0 mi/h 1.0 mi/h	49.0 mi/h 0.7 mi/h 46.1 mi/h 94.2 %
Fax: Two-Lane Highway nns County	7/18/16 Weekday PM Peak Solano Avenue near 5:37 Solano Avenue County of Napa 2016 Appr Plus Proj NB	Peak hour factor, it % Trucks and buser it Truck crawl speed mi Truck crawl speed % Recreational vel mi % No-passing zoner %	Vd 115 veh/h Vo 132 veh/h Average Travel Speed	Analysis(d) 2.0* 1.0 1.0 1.0 1.00 1.00 2) vi 131	Measurement: 3) S FM -3) V 3) BFFS width, (note-3) fLS ty, (note-3) fA	zones, fnp
Phone: E-Mail: Directional Analyst R-Tra	rmed ime Period on ear n Exist Plus	Highway class Class 3 Shoulder width 12.0 Segment length 1.0 Terrain type Level Grade: Length -	Analysis direction volume, Opposing direction volume,	Direction PCE for trucks, ET PCE for trys, ET PREVS, EF Reavy-vehicle adj. factor, (note-5) Grade adj. factor, (note-1) fg Directional flow rate, (note-2) vi	Free-Flow Speed from Field Measurement: Field measured speed, (note-3) S FM Observed total demand, (note-3) V Estimated Free-Flow Speed: Base free-flow speed, (note-3) BFFS Adj. for lane and shoulder width, (note-3) Adj. for access point density, (note-3) FA	Free-flow speed, FFSd Adjustment for no-passing zon Average travel speed, ATSd Percent Free Flow Speed, PFFS

	15	ne Analysis	within effective travel speed, Lde of effective lane travel speed, Ld - mi lane lane, ATSpl - ing lane, PFFSpl - specime lane	C	Performance Measures with Passing Lane
ent factor, fHV or.(note-1) fg (note-2) vi nt-following, not sing zones, fnp llowing, PTSFG	ravel, vel, vM	Total length of analysis segment, Lt Length of two-lane highway upstream of the p Length of passing lane including tapers, Lpl Average travel speed, ATGG (from above) Percent time-spent-following, PTSFG (from ab Level of service, LOSG (from above) Average Travel Speed wit	Downstream length of two-lane highway within effective length of passing lane for average travel speed, Lde Length of two-lane highway downstream of effective length of the passing lane for average travel speed, Adj. factor for the effect of passing lane, ATSpl Average travel speed, including passing lane, ATSpl Percent free flow speed including passing lane, PFFSpl Percent free flow speed including passing lane, PFFSpl		Level of Service and Other Performar

Phone: E-Mail: Directional Two-Lane Highway Segment Analysis	Direction PCE for tru PCE for kVs Heavy-vehic Grade adjus Directional Base percen Adjustment Percent tim
Analyst Mapa County Date Performed 7/18/16 Analysis Time Period Weekday PM Peak Highway From/To Ounty of Napa Analysis Year Analysis Year Description Linput Data	Level of se Volume to or Peak 15-min Peak-hour w Peak 15-min Capacity fr Capacity fr Capacity fr Directional
ft ft mi mi Tru mai Aru	Total lengt Length of t Length of p Average tra Percent tim Level of se
Analysis direction volume, Vd 132 veh/h Opposing direction volume, Vo 115 veh/h Average Travel Speed Direction Analysis(d) PCE for trucks, ET PCE for RVs, ER 1.0 Heavy-vehicle adj. factor, (note-5) fHV Grade add. factor, (note-1) fg 1.00 1.00 1.00 1.00 1.00 1.00 1.00	Downstream Length of the length of len
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Heavy-vehicle adjustment factor, fHV 0.995 Grade adjustment factor, (note-1) fg 1.00 Directional flow rate, (note-2) vi 144 Disable percent time-spent following, (note-4) BPTSFG 16.2 Balancian for non-serial research from the conservations of the conservation of t	1.00	
	126	pc/h
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Capacity from ATS, CdATS 1635 veh/h	n 'n	
1635	/h	
Passing Lane Analysis		
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Level of service, LOSd (from above)		
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the passing lane for percent time-spent-following, Ld - Add. factor for the effect of passing lane	н	mı
on percent time-spent-following, fpl		
Percent time-spent-following including passing lane, PTSFpl	gp.	οiρ
Level of Service and Other Performance Measures with Passing	sing Lane	je je
Level of service including passing lane, LOSpl E veh-h	- h	

Percent Time-Spent-Following

Segment Analysis	9	*Prack hour factor, PHF 0.85	· pa	(d) Opposing (o) 2.0* 1.0 0.952 1.00 pc/h 158 pc/h	- mi/h 50.0 mi/h 0.0 mi/h 1.0 mi/h	49.0 mi/h 0.7 mi/h
Fax: E-Mail: Directional Two-Lane Highway S	Analyst Agency/Co. Appa County Date Performed Analysis Time Period From/To Ourisdiction Analysis Year Analysis Year Description Exist Plus Appr Plus Proj NB	Highway class Class 3 feak hour factor, Shoulder width 12.0 ft % Trucks and buses Lane width 1.0 ft % Trucks crawling Segment length 1.0 mi Truck crawl speed Terrain type Level mi % Recreational veh Grade: Length - mi % No-passing zones Up/down - % Access point densi	Analysis direction volume, Vd 96 veh/h Opposing direction volume, Vo 128 veh/h Average Travel Speed	Direction Analysis (d) PCE for trucks, ET 2.0* PCE for RVs, ER 1.0 Heavy-whicle adj. factor, (note-5) fHV 0.952 Grade adj. factor, (note-1) fg 1.00 Directional flow rate, (note-2) vi 119	Free-Flow Speed from Field Measurement: Field measured speed, (note-3) S FM Observed total demand, (note-3) V Estimated Free-Flow Speed: Base free-Flow speed; (note-3) BFFS Adj. for lane and shoulder width, (note-3) fLS Adj. for access point density, (note-3) fA	Free-flow speed, FFSd Adjustment for no-passing zones, fnp Arerade travel speed, ATSd

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Fax: Two-Lane Highway Segment Analysis	Peak Nue Solano Avenue Napa Input Data	Peak hour factor, PHF 0.92 % Trucks and buses 5 % Trucks crawling 0.0 % Truck crawl speed 0.0 mi/hr % Recreational vehicles 2 % No-passing zones 5 % Mi.	veh/h veh/h Travel Speed	Analysis(d) Opposing (o) 2.0* 1.0 1.0 1.0 0.952 1.00 1.00 1.00 1.00 1.00 146 pc/h 185 pc/h	nt: - mi/h - veh/h 50.0 mi/h ce-3) fLS 0.0 mi/h 3) fA 1.0 mi/h	49.0 mi/h 1.0 mi/h 45.4 mi/h 92.7 %
Phone: E-Mail: Directional Two-Lane	Analyst Agency/Co. Date Performed Analysis Time Period Highway From/To Jurisdiction Analysis Yaar Analysis Yaar Description Future NB Conditions Input I	Highway class Class 3 Shoulder width 7.0 ft Lane width 12.0 ft Segment length 1.0 mi Terrain type Level mi Grade: Length - 8	Analysis direction volume, Vd 128 Opposing direction volume, Vo 162	Direction PCE for trucks, ET PCE for Nvs, ER Heavy-vehicle adj. factor, (note-5) fi Grade adj. factor, (note-1) fg Directional flow rate, (note-2) vi	Free-Flow Speed from Field Measurement: Field measured speed, (note-3) S FM Observed total demand, (note-3) V Estimated Free-Flow Speed: Base free-flow speed, (note-3) BFFS Adj. for lane and shoulder width, (note-3) Adj. for access point density, (note-3) FA	Free-flow speed, FFSd Adjustment for no-passing zones, fnp Average travel speed, ATSd Percent Free Flow Speed, PFFS

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Travel, VMT15 128 128 128 128 128 128 128 1	of service, Los	A		
nour vehicle-miles of travel, WMT60 15-min total travel time, TT15 16-min total travel time, TT15 16-min total travel 15-min total travel 16-min time-spent total travel 16-min time-spent total travel 16-min time-spent time-spent total travel 16-min total travel time, TT15 16-min total travel time, TT15 16-min total travel time, TT15	15-min vehicle-miles of travel, VMT1	35	veh-mi	
Passing Lane Analysis Passing Lane Analysis egment, Lt upding tapers, Lpl (from above) Travel Speed with Passing Lane flor average travel speed, Lde downstream of effective for average travel speed, Ld - cluding passing lane, ATSpl and for average travel speed, Ld - cluding passing lane, PFFSpl on the form above) Travel Speed with Passing Lane for average travel speed, Ld - cluding passing lane, ATSpl and flor average travel speed, Ld - cluding passing lane, ATSpl cluding passing lane, ATSpl or average travel speed, Ld - cluding passing lane, ATSpl cluding passing lane, ATSpl or average travel speed, Ld - cluding passing lane, ATSpl cluding passing lane be Spent-Following, Ld - downstream of effective length of contern time-spent-following, Ld - of passing lane con passing lane be PTSFpl other Performance Measures with Passing La passing lane, LOSpl E veh-h	travel, VMT60	128	veh-mi	
Passing Lane Analysis egment, Lt upstream of the passing lane, Lu - luding tapers, Lpl (from above) Travel Speed with Passing Lane for average travel speed, Ld - downstream of effective for average travel speed, Ld - lane for average travel speed, Ld - of passing lane, ATSpl ane highway within effective lane for average travel speed, Ld - cluding passing lane, ATSpl me-Spent-Following with Passing Lane ane highway within effective length recent time-spent-following, Ld - downstream of effective length of ercent time-spent-following, Ld - downstream of effective length of ercent time-spent-following, Ld - downstream of passing lane y PTSFpl other Performance Measures with Passing La passing lane, LOSpl E veh-h	ak 15-min total travel time, TT15	1657	veh-h	
length of analysis segment, Lt length of analysis segment, Lt length of analysis segment, Lt lof two-lane highway upstream of the passing lane, Lu lof passing lane including tapers, Lpl detravel speed, ATSG (from above) Average Travel Speed with Passing Lane Average Travel Speed with Passing Lane Average Travel Speed with Passing Lane length of two-lane highway within effective lof two-lane highway downstream of effective lof two-lane highway downstream of effective lof two-lane highway downstream of effective length average speed, fpl average speed, fpl leactor for the effect of passing lane, ATSpl let free flow speed including passing lane, PFFSpl tream length of two-lane highway within effective length passing lane for percent time-spent-following, Ld lof two-lane highway downstream of effective length of passing lane for percent time-spent-following, Ld lof two-lane highway downstream of effective length of actor for the effect of passing lane let time-spent-following, fpl tt time-spent-following, Fpl Level of Service and Other Performance Measures with Passing La of service including passing lane, TTSpl le-min total travel time, TTIS - veh-h	pacity from PTSF, CdPTSF	1692	veh/h	
length of analysis segment, Lt of two-lane highway upstream of the passing lane, Lu - of passing lane including tapers, Lpl 45.4 ge travel speed, ATSd (from above) 24.0 of service, LoSd (from above) April 45.4 time-spent-following, PTSFd (from above) April 24.0 Average Travel Speed with Passing Lane Incam length of two-lane highway within effective of two-lane highway downstream of effective nof two-lane highway downstream of effective average speed, fpl 0.0 ge travel speed, Ld - average speed, fpl 0.0 Travel speed including passing lane, ATSpl 0.0 tream length of two-lane highway within effective length percent Time-Spent-Following with Passing Lane travel speed including passing lane, ATSpl 0.0 the free flow speed including passing lane, PFFSpl 0.0 the formulane for percent time-spent-following, Ld nof two-lane highway downstream of effective length of eactor for the effect of passing lane the passing lane for percent time-spent-following, Ld not the effect of passing lane not the effect of passing lane level of Service and Other Performance Measures with Passing La of service including passing lane, TTSP Level of service including passing lane, TTSP lesmin total travel time, TTIS	rectional Capacity	1651	veh/h	
length of analysis segment, Lt of two-lane highway upstream of the passing lane, Lu - lof passing lane including tapers, Lpl - 45.4 ttime-spent-following, PTSFG (from above) ttime-spent-following, PTSFG (from above) Average Travel Speed with Passing Lane Average Travel Speed with Passing Lane Average Travel Speed with Passing Lane Exam length of two-lane highway within effective of two-lane highway downstream of effective nof two-lane highway downstream of effective actor for the effect of passing lane laverage speed, fpl average speed, fpl average speed, fpl travel speed including passing lane, ATSpl of two-lane highway within effective length passing lane for percent time-spent-following, Ld expassing lane for percent time-spent-following, Ld factor for the effect of passing lane nof two-lane highway downstream of effective length of f actor for the effect of passing lane nof two-lane highway downstream of effective length of actor for the effect of passing lane nof two-lane highway downstream of effective length of actor for the effect of passing lane length of Service and other Performance Measures with Passing La level of Service including passing lane, TTIS evel faravel time-yenl time, TTIS	Lane	S		
n of passing lane highway upstream of the passing lane, Lu - n of passing lane including tapers, Lpl = 45.4 at time-speed, ATGG (from above) It time-speed, ATGG (from above) Average Travel Speed with Passing Lane Average Travel Speed with Passing Lane Average Travel Speed with passing Lane The passing lane for average travel speed, Ld = n of two-lane highway wouthin effective The passing lane for average travel speed, Ld = n of two-lane highway downstream of effective Taverage speed, fpl = n of passing lane and the passing lane are flow speed including passing lane, ATSpl = n of two-lane highway within effective length for speed including passing lane, ATSpl = n of two-lane highway within effective length of passing lane for percent time-spent-following, Ld = n of two-lane highway within effective length of fector for the effect of passing lane are for percent time-spent-following, fpl = n of two-lane highway within effective length of fector for the effect of passing lane are spent-following, fpl = n of two-lane highway fpl = n of two-lane highway fpl = n of two-lane highway within effective length of fector for the effect of passing lane are spent-following, fpl = n of two-lane highway fpl = n of service including passing lane, TTSP = n of service including passing lane, TTIS = n of two-lane travel time-tTIS = n of two-lane travel time for the travel time, TTIS = n of two-lane travel time for the tTIS = n of two-lane travel time for two travel time for the two-lane highway falle for the file travel time, TTIS = n of two-lane for the file travel time for the file two files for two files for the files for two files for the files for two files for	gth of analysis segment, Lt			mi
trime-specific from above) It time-specific from above) Average Travel Speed with Passing Lane Average Travel Speed with Passing Lane Average Travel Speed with Passing Lane The specific from above) The specific from above) The specific from above of the speed, Lde The specific from average travel speed, Lde The specific from average travel speed, Lde The specific from average travel speed, Ld - The specific from the effect of passing lane and other Performance Measures with Passing La - The specific including passing lane, TTIS - The specific from the speed from travel time, TTIS - The specific from average from the speed from the speed spe	ngth of two-lane highway upstream of the passi	lane,		mi
of service, LOSd (from above) Average Travel Speed with Passing Lane Average Travel Speed with Passing Lane Average Travel Speed with Passing Lane Ength of two-lane highway within effective of two-lane highway downstream of effective actor for the effect of passing lane average speed, fpl average speed, fpl average speed, fpl erravel speed including passing lane, ATSpl of two-lane highway within effective length Free flow speed including passing lane, PFFSpl of two-lane highway within effective length f passing lane for percent time-spent-following, Ld actor for the effect of passing lane nof two-lane highway downstream of effective length of f actor for the effect of passing lane not two-lane highway downstream of effective length of actor for the effect of passing lane of stevent time-spent-following, fpl Level of Service and Other Performance Measures with Passing La of service including passing lane, TTIS of service including passing lane, TTIS - veh-h			45.4	mi/h
of service, LOSA (from above) Average Travel Speed with Passing Lane tream length of two-lane highway within effective nof two-lane highway within effective nof two-lane highway downstream of effective nof two-lane highway downstream of effective average speed, fpl sector for the effect of passing lane, ATSpl average speed, fpl ge travel speed including passing lane, ATSpl or free flow speed including passing lane, ATSpl ream length of two-lane highway within effective length free flow speed including passing lane, PFFSpl of two-lane highway downstream of effective length free flow speed including passing lane to two-lane highway downstream of effective length of not two-lane highway fountstream of effective length of not two-lane highway downstream of effective length of not two-lane highway downstream of effective length of not two-lane highway downstream of effective length of not two-lane highway within effective not two-lane highway within	nt time-spent-following, PTSFd (from			11 / TIM
e e e e e e e e e e e e e e e e e e e	of service, LOSd		A	
e e e e e e e e e e e e e e e e e e e	Travel Speed with			
0.0 0.0 0.0 0.0 0.0 0.0		ctive		
e 0.0 ssing La	length of passing lane for average travel sp	Id	1	mi
e 0.0 ssing La	ngth of two-lane highway downstream of effecti length of the passing lane for average trave	ed,	1	mi
e 0.0 ssing La	. factor for the effect of passing lane			
0.0 	average speed, fpl		1,	
e ssing La	free flow	FFSpl		olo
ssing La			Lane	
ssing La	wnstream length of two-lane highway within eff	ctive len	gth	
ssing La	or passing lane for percent time-spent-follo ingth of two-lane highway downstream of effecti	ing, Lde	of -	mi
on percent time-spent-following, fpl cent time-spent-following, fpl including passing lane, PTSFpl Level of Service and Other Performance Measures with Passing el of service including passing lane, LOSpl E veh-h	the passing lane for percent time-spent-foll	wing, Ld	1	mi
ncluding passing lane, PTSFpl Level of Service and Other Performance Measures with Passing of service including passing lane, LOSpl E veh-h	on percent time-spent-following,		1	
Level of Service and Other Performance Measures with Passing of service including passing lane, LOSpl E veh-h	rcent time-spent-following including passing lane, PTSFpl		1	dis
Level of Service and Other Performance Measures with Passing of service including passing lane, LOSpl E veh-h 15-min total travel time, TT15				,
of service including passing lane, LOSpl E 15-min total travel time, TT15	of Service and Other	ures with	Passing	Lane
	of service including passing lane, 15-min total travel time, TT15	四 1	veh-h	

Phone: Fax:	
E-Mail:	
Directional Two-Lane Highway S	Segment Analysis
Analyst W-Trans	
formed	
Analysis Time Feriod Weekday FM Feak	
County of Napa	
2016	
Description Future SB Conditions	
Input Data	
Class 3 Pe	РИЕ
idth 7.0 ft % Trucks	20 0
dth 12.0 ft % Trucks cr	0.0
length 1.0 mi Tr	0.0
n type Level %	al vehicles 2
ch – mi	zones 5
Up/down - % Access point	density
direction volume, Vo 128	
Average Travel Speed	The state of the s
ection Analysi	oddo
for trucks, ET	
le adj. factor, (note-5) fHV (
	1.00
flow rate, (note-2) vi	pc/h
a	
Field measured speed, (note-3) S FM	- mi/h
	- veh/h
for lane and shoulder width, (note-3) fLS	0.0 mi/h
Adj. for access point density, (note-3) fA	1.0 mi/h
Free-flow speed, FFSd	49.0 mi/h
Adjustment for no-passing zones, inp	0.6 mi/h
\vdash	n c

Per for trucks, ET 1.1 1.0 1.0 1.0 1.0 1.0 1.0 1.	Opposing	(0)
0095 00 0.995 00 0.995 00 0.995 01 00 0.995 01 140 01 18.6 0.1	1.1	
995 00 00 00 01 00 01 01 01 01 01 01 01 01	1.0	
000 77 pc/h 140 8 140 8 29.8 8 erformance Measures 0.11 veh-mi 1.0 veh-h 1642 veh/h 1643 veh/h 1644 veh/h 1645 veh/h 1645 veh/h 1646 veh/h 1646 veh/h 1647 veh/h 1648 veh/h 1648 veh/h 1649 veh/h 1649 veh/h 1649 veh/h 1649 veh/h 1640 veh/h 164	0.995	
7 pc/h	1.00	
PTSFG 19.4 % 18.6 % 29.8 % erformance Measures A 0.11 veh-mi 162 veh-mi 1692 veh/h 1692 veh/h 1642 veh/h alysis assing lane, Lu - 45.8 ove) A 5.8 h Passing Lane erfective	140	pc/h
18.6 29.8 8 8 0.11 44 162 veh-mi 160 veh/h 1642 veh/h 1692 veh/h 1	DATE SALES	
erformance Measures_ A 0.11 44 veh-mi 162 veh/h 1692 veh/h 1692 veh/h 1642 veh/h alysis_ assing lane, Lu		
arformance Measures		
A 0.11 44 veh-mi 162 veh-mi 1.0 veh-h 1642 veh/h 1692 veh/h 1692 veh/h alysis assing lane, Lu - 45.8 cove) A 59.8 A 65.8	sains	
0.11 44 veh-mi 162 veh-mi 1.0 veh-h 1642 veh/h 1642 veh/h 1642 veh/h 1642 veh/h alysis 1:0 assing lane, Lu - - 0ve) A5.8 A 5.8 A 5.8		
44 veh-mi 162 veh-mi 1.0 veh-h 1642 veh/h 1692 veh/h 1692 veh/h alysis		
162 veh-mi 1.0 veh-n 1642 veh/n 1642 veh/n 1642 veh/n alysis assing lane, Lu - 45.8 ove) A 5.8 h Passing Lane effective	veh-mi	
1.0 veh-h 1642 veh/h 1642 veh/h 1642 veh/h alysis assing lane, Lu	veh-mi	
1642 veh/h 1692 veh/h alysis assing lane, Lu - 675 eve) A 5.8 A 6.8 A 7.8 A 7.	veh-h	
alysis	veh/h	
alysis reh/h alysis 1.0 assing lane, Lu - 45.8 ove) A - 45.8 h Passing Lane - A - 65.8	veh/h	
alysis	veh/h	
alysis assing lane, Lu 45.8 ove) A Passing Lane		
assing lane, Lu		
assing lane, Lu - 45.8 ove) A B A A B B B B B B B B B B B B B B B	1.0	mi
ove) 45.8 A Passing Lane		mi
ove) 29.8 A h Passing Lane effective	ı	mi
om above) with Passing Lane	45.8	mi/h
peed with Passing Laneav within effective	29.8	
Average Travel Speed	A	
length of two-lane bighway wit		
nounstream length of two-lane highway within effective		
The same of the sa		
length of possing lane for average travel speed. Lide		11.0 0.995 1.00

Average Travel Speed with Passing Lane			
nownstream length of two-lane highway within effective length of passing lane for average travel speed, Lde ength of two-lane highway downstream of effective length of the passing lane for average travel speed, Ld di. factor for the effect of passing lane	1	m im	
e, ATSpl lane, PFFSpl ng with Passing Lan	0.0	dip	
Nownstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Ide		mi	
5	1 1	mi	
ercent time-spent-following including passing lane, PTSFpl		olo	
easur	ssing I	ane	
evel of service including passing lane, LOSpl E veak 15-min total travel time, TT15	veh-h		

Bicycle Level of Service

Phone: E-Mail:		e x x x x x x x x x x x x x x x x x x x					
Direct	Directional Two-Lane H	Highway Segment Analysis	gment A	nalysis			
Analyst Agency/Co. Date Performed	W-Trans Napa County 7/18/16						
Analysis Time Period Highway From/To	Weekend Midday Solano Avenue near 5537 Solano Avenue	o Avenue					
Jurisdiction Analysis Year	County of Napa 2016						
	- 1	Input Data					
Class	Pe	Peak hour factor,		PHF 0	0.85		
Shoulder width 7.	O ft	Trucks and buses Trucks crawling	and buses	n C	0	0P 06	
ngth	mi Tr	Truck crawl speed	speed		0	mi/hr	
Terrain type Le	Level mi % N	No-passing zones	al vehi	cles 2		olo ole	
	Ac	Access point				/mi	
Analysis direction volume, Opposing direction volume,	me, Vd 101 me, Vo 145	veh/h					
	Average Tra	Travel Speed					
Direction PCE for trucks, ET PCE for RVs, ER Harry-rehicle add fact	Partor (Porto-E) FHIV	Analysis (d) 2.0* 1.0		Opposing 2.0*		(0)	
	Vi.	1.00	pc/h		1.00	pc/h	
Free-Flow Speed from Field Measurement: Field measured speed, (note-3) S FM Observed total demand, (note-3) V	eld Measurement: ote-3) S FM note-3) V		1.1	mi/h veh/h			
Estimated Free-Flow Speed: Base Free-flow speed, (note-3) BFFS Adj. for lane and shoulder width, (Adj. for access point density, (not	rree-Flow Speed: -flow speed, (note-3) BFFS lane and shoulder width, (note-3) access point density, (note-3) fA	frs	50.0	mi/h mi/h mi/h			
Free-flow speed, FFSd		4	0.6	mi/h			
Adjustment for no-passing zones, Average travel speed, ATSd Percent Free Flow Speed, PFFS	ng zones, fnp ISd , PFFS	040	0.9 45.7 93.3	mi/h mi/h %			

(0)			4/00	bol											mi	mi	mi/h	m1/n			mi	mi			000		im		mi		olo	Lane	
Opposing	1.0	0.995	171	4,	d	90	easures			veh-mi	veh-h	veh/h	veh/h		1.0	Lu -		20.9	A	ne		r pr			0.0	g Lane	ength	h of	ı	1		with Passing	veh-h
sis(d)	1.0	995	000	Fd 13.	17.7	20.9	and Other Performance Measure	A C	30.07	101	0.7	1651	1692	Analysis		passing lane,		above)		th Passing Lane	n effective	travel speed,		, ATSpl	ane, PFFSpl	g with Passin	following, Ld	fective lengt	-following, Ld			erformance Measures wi	Lospl E
Analysi	र त	fHV	I) ig	-4)	zones, fnp	lg, FISEG	Service and Other 1		V/C	travel, VMT60	ime, TT15			Passing Lane A	egment, Lt	am of th	(from above)	Fd (from	bove)	Average Travel Speed with	of two-lane highway within effective	lane for average travel	of passing lane	speed, including passing lane, ATSpl	cluding passing la	Time-Spent-Following with Passing	ane highway within	downstream of ef	ercent time-spent of passing lane		PTSFp1	DI.	ing lane, TT15
ction for trucks, ET	RVS, ER	Heavy-vehicle adjustment factor,	Grade adjustment factor, (note-	cent time-spent-fol	Adjustment for no-passing zones, fnp	cime-spent-rottowin	Level of Se	ervice, LOS	o capacity ratio,	Peak-bour vehicle-miles of travel, VMT60	min total travel ti	Capacity from ATS, CdATS	Capacity from PTSF, CdPTSF Directional Capacity		length of analysis segment, Lt	f two-lane highway	Average travel sneed and (from above)	time-spent-following,	service, LOSd (from	Average	Downstream length of two-lane highway within effective length of passing lane for average travel speed,	length of the passing lane for average travel	factor for the effect		free flow speed inc	Percent Tin	Downstream length of two-lane highway within effective length of passing lane for percent time-spent-following, Ide	f two-lane highway	the passing lane for percent time-spent-following, factor for the effect of passing lane	on percent time-spent-following,	including passing lane, PTSFp1	Level of Service and Other	of service including passing lane, 15-min total travel time, TT15
Direction PCE for t	PCE for H	Heavy-vel	Grade ad	Base per	Adjustmen	rercent		Level of	Volume to	Peak-hour	Peak 15-r	Capacity	Capacity		Total ler	Length o	Average o	Percent	Level of		Downstre	2)	Adj. faci	verage	Percent		Downstre of pa	Length o	Adj. fact	Dercent 1	1	Le	Level of Peak 15-m

Phone: Fax: E-Mail:		
	nt Analysis	
W-Tra		
Co.		
s Time Period		
Highway Solano Avenue From/To near 5537 Solano Avenue		
County of		
Analysis fear Description Future SB Conditions		
Input Data		
Highway class 3 Peak hour factor	, PHF	
h 7.0 ft % Trucks	5	
dth 12.0 ft	0.0	1
length 1.0 mi Truck cra	0.0 mi	
mi	2	
Up/down - % Access point	density 4 /mi	red.
Analysis direction volume, Vd 145 veh/h Opposing direction volume, Vo 101 veh/h		
Average Travel Speed		
ection Anal	Opposing (o)	
ET.	1.0	
(note-5) fHV 0	0.952	
tor, (note-1) fg 1.00 ow rate, (note-2) vi 179	1.00 pc/h 125 pc/	CA
Free-Flow Speed from Field Measurement:		
Field measured speed, (note-3) S FM	mi/h	
Observed total demand, (note-3) V	Ve11/11	
e free-flow speed, (note-3) BFFS	0 mi/h	
Adj. for lane and shoulder width, (note-3) fLS 0.0 Adj. for access point density, (note-3) fA 1.0	mi/h mi/h	
Free-flow speed, FFSd 49.	0 mi/h	
Adjustment for no-passing zones, fnp 0.4	mi/h	
Average travel speed, ATSd Percent Free Flow Speed, PFFS 94.	2 mi/h 3 %	

PCE for trucks, ET		
	0.1	
addingtwont factor full	2000	
(note-1) for	1.00	
rional flow rate, (note-2) v	119	pc/h
ing, (note-4) BPTSFd	8	
	17.7	
	.2 %	
Level of Service and Other Performance Measures	e Measures	
of service, LOS	A	
15		
Peak-hour vehicle-miles of travel, VMT60	145 veh-mi	
Capacity from Als, Cabis		
	1635 veh/h	
Passing Lane Analysis		
Total length of analysis segment, Lt	1.0	mi
	lane, Lu -	mi
Length of passing lane including tapers, Lpl		mi
Average travel speed, ATSd (from above)	46.2	mi/h
Percent time-spent-following, PTSFd (from above)	29.5	
Level of service, LOSd (from above)	A	
Average Travel Speed with Passing Lane	Lane	
Downstream length of two-lane highway within effectiv	a.	
length of passing lane for average travel speed,	- rde	mi
Length of two-lane highway downstream of effective		ī
length of the passing lane for average travel speed,	ed, Ld -	mi
on average speed, fol		
Average travel speed including passing lane, ATSpl	1	
free f]	1 0.0	olo
Percent Time-Spent-Following with Passing	sing Lane	
nounctions leadth of two-lane highway within offective length	e length	
of passing lane for percent time-spent-following, Ide	Lde -	mi
Length of two-lane highway downstream of effective length	ngth of	
the passing lane for percent time-spent-following, Ld	, Ld -	mi
the ellect of passing	1	
Percent time-spent following		
including passing lane, PTSFpl	1	olp
Level of Service and Other Performance Measures	with Passing	Lane
Level of service including passing lane, LOSpl	200	
	N-H-II	

Phone: Fax: E-Mail:			
Directional Two-Lane Highway	Segment	Analysis	
Analyst Agency/Co. Napa County Date Performed 7/18/16 Analysis Time Period Weekday PM Peak Highway Slano Avenue From/Tro Outsisdiction County of Napa Analysis Year Description Future Plus Proj NB	, en		
Input Data			
Class 3	factor	DHE 0 43	
7.0 ft % Trucks	ind buse	2	de
dth 12.0 ft	O	0	dip
length 1.0 mi Tr	wl speed	0.0	mi/
Grade Terrain type Level * Recreat	Recreational vehi	cles 2	olo ol
undp/dn	dens	ty 4	/mi
Analysis direction volume, Vd 132 veh/h Opposing direction volume, Vo 165 veh/h			
Average Travel Sp	Speed		
Analy 2	s (d)	Opposing (o)	
f ER 1 le adj. factor, (note-5) fHV 0	52	1.0	
- 10	0 pc/h	1.00	DC
from Field Mea			
Field measured speed, (note-3) S FM Observed total demand, (note-3) V	1-1	mi/h veh/h	
Flow Speed:	0	- 1	
base ire-line where, note-3) Brs. Addj. for lane and shoulder width, (note-3) fLS Addj. for access point density, (note-3) fA	0.0	mi/h mi/h mi/h	
Free-flow speed, FFSd	49.0	mi/h	
Adjustment for no-passing zones, inp Average travel speed, ATSd Percent Free Flow Speed, PFFS	1.0 45.3 92.5	mi/h mi/h %	

Phone: E-Mail:	n a x			
Directional Two-L	Two-Lane Highway S	Segment Ana	Analysis	-
Analyst W-Trans				
Agency/Co. Date Performed 7/18/16	×			
Period Weekday	Peak			
Highway Solano Avenue	enue Solano Avenue			
tion County of				
r 2016				
Description future rius rioj ab	Input Data			
Highway class Class 3		factor, PH	(su	
r width 7.0	Trucks	es proper	2	90
12.0	% Trucks cr	crawling	0.0	olo
egment length	Truck crawl speed	3	000	m1
Terrain type Level	* No-passing	or zones	7 2 2	0 00
up/down -	O	dens	4	л/
Analysis direction volume, Vd 165				
direction volume	veh/h			
Averag	e Travel Speed	pq		
Direction	Analysis ((p)	Opposing	(0)
for truc	2.0*		2.0*	
PCE for RVs, ER Heavv-vehicle adi. factor, (note-5)	fHV 0.952	0.1	0.952	
(note-1)	1.	4/04	1.00	٤
Directional flow face, (note-2) vi	4		4	4
Tiel-Flow Speed Irom Fleid Measurement.	menc.	E	mi/h	
Observed total demand, (note-3) V	1	1	veh/h	
- 62				
free-	20+0-31 FT.S	50.0 m	mi/h mi/h	
OL	£A		mi/h	
Free-flow speed, FFSd		49.0 m	mi/h	
Addustment for no-bassing zones, f	duj		mi/h	
avel speed, ATSd		45.7 m	mi/h	
Percent Free Flow Speed, PFFS				

PEE for trucks, FT 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.	for trucks, ET		
1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00	4 Diff Diff	T.T.	
1.00 180 180 190 180 18.8 30.1 8 30.1 8 30.1 8 45 10.1 10.0 10.0 10.0 10.0 10.0 10.0 10.	footon flui	0.00	
180 pc/h 191 BPTSFG 19.7 % 18.8 30.1 % 18.8 30.1 % 19.8 30.1 % 16.5 veh-mi 16.5 veh-h 16.42 veh/h 16.6 - n 18.8 sing Lane 19.8 sing Lane 19.9 sing Lane 10.0 sing with Passing Lane 10.0 sing with Passing Lane 10.0 sing with Passing Lare 10.0 sing Lane 10.0	ractor, inv	1.00	
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sr Performance Measures A 0.11	4) BPTSFd	1	
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			Weekend Midday Solano Avenue	near 553/ Solano Avenue County of Napa 2016 Plus Proj NB Conditions	 Peak hour factor, PHF	ft % Trucks and buses	1.0 mi Truck crawl speed 0.0 mi/hr Level % Recreational vehicles 2 % - mi % No-passing zones 5 % - % Access point density 4 /mi	volume, Vd 105 veh/h volume, Vo 150 veh/h	Average Travel Speed	Analysis(d) Oppo 2.0* 1.0 1.0 1.0 0.952	1.00 vi 130 pc/h	Free-Flow Speed from Field Measurement: Field measured speed, (note-3) S FM Observed total demand, (note-3) V Fet imated Free-Flow Speed.	free-flow speed (note-3) BFFS 50.0 mi/h for lane and shoulder width, (note-3) fLS 0.0 mi/h for access point density, (note-3) fA 1.0 mi/h	8d mi/h	Adjustment for no-passing zones, fnp 1.0 mi/h
Phone: E-Mail:	Analyst	Agency/Co. Date Performed	Analysis Time Period Highway	From/To Jurisdiction Analysis Year Description Future	Highway class Class	Snoulder width	Segment length Terrain type Grade: Length Up/down	Analysis direction Opposing direction		Direction PCE for trucks, ET PCE for RVs, ER Heavy-vehicle adj.	Grade adj. factor, (note-1) fg Directional flow rate, (note-2)	Free-Flow Speed from Field Mea Field measured speed, (note-3) Observed total demand, (note-3) Estimated Free-Flow Speed	Base free-flow speed, (note-3) BFFS Adj. for lane and shoulder width, (Adj. for access point density, (not.	Free-flow speed, FFSd	Adjustment for no-passing

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Time Period Netrans No. 118/16 Time Period Neekend Midday Solano Avenue near 5373 Solano Avenue county of Napa 2016 Time Period Neekend Midday Solano Avenue near 5373 Solano Avenue near 5373 Solano Avenue county of Napa 2016 Time Period SB Conditions Input Data Input Data Input Data Input Srock crawlinged trucks crawling soland new		
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Direction PCE for trucks, ET 1.1 Heavy-vehicle adjustment factor, fHV Grade adjustment factor, (note-1) fg Directional flow rate, (note-2) vi 1.77 Base percent time-spent-following, (note-4) BPTSFd	Adjustment for no-passing zones, fnp 18.0 Percent time-spent-following, PTSFd 30.0 % Level of Service and Other Performance Measures	- W O W	Passing Lane Analysi	Lt am of th	Length of passing lane including tapers, Lpl Average travel speed, ATSd (from above) Percent time-spent-following, PTSFd (from above) Level of service, LOSd (from above)	Average Travel Speed with P	Downstream length of two-lane highway within effective length of passing lane for average travel speed, L	Length of two-lane highway downstream of effective length of the passing lane for average travel Adj. factor for the effect of passing lane	Average travel speed including passing lane, ATSpl Percent free flow speed including passing lane, PFFSpl	Percent Time-Spent-Following with Passing	Downstream length of two-lane highway within effective le of passing lane for percent time-spent-following, Lde Tennth of two-lane highway downstream of effective length		Percent time-spent-following including passing lane, PTSFpl	Level of Service and Other Performance Measures	TOOL and said and sai

