Left-Turn Queue Analysis

Jessel Gallery and Prime Solum Tasting Room & Barrel Storage,
P12-00194 - UP
Planning Commission Hearing October 19, 2016

March 21, 2016

Mr. Bill Hill
Prime Solum
1094 Soda Canyon Road
Napa, CA 94558

Left-turn Queuing Analysis for the Prime Solum Tasting Room and Jessel Art Gallery Projects

Dear Mr. Hill;

W-Trans has completed an analysis of the adequacy of the existing left-turn pocket on Atlas Peak Road to accommodate additional traffic associated with the Jessel Art Gallery and Prime Solum tasting room at 1055 and 1074 Atlas Peak Road in the County of Napa. Both sites are served by a single driveway located approximately 125 feet southeast of the intersection of Atlas Peak Road/Hillcrest Drive. The focus of our analysis was to determine if the existing opening of the median on Atlas Peak Road is adequate to accommodate the anticipated visitation at the project site.

Existing Conditions

The existing opening in the median on Atlas Peak Road at the project driveway that is sufficiently wide to accommodate a vehicle queued to turn into the site was determined to be about 35 feet. For design of a turn pocket it is typically assumed that one vehicle-length is 25 feet. The existing opening is therefore adequate for only a single vehicle to queue, so a queue in excess of one cannot be accommodated.

Trip Generation

The proposed Prime Solum Tasting Room, Jessel Art Gallery and a single apartment will share a driveway, so in evaluating the adequacy of the existing left-turn pocket the visitation level for both uses as well as trips for the apartment resident were reviewed.

Counts were taken at the driveway to determine the existing volume of traffic associated with the art gallery. These counts indicate that three and four vehicles currently access the site via left-turns during the weekend midday and weekday p.m. peak hours respectively. It is assumed that one trip would be the resident of the apartment, and the remaining two or three were gallery visitors. The County's "Winery Traffic Information/Trip Generation Sheet" was referenced to determine vehicle occupancy and the rates vary depending on the day of the week, with 2.6 visitors per vehicle for weekdays while 2.8 visitors per vehicle for weekends. Using the County's vehicle occupancy rates, the three p.m. peak hour and two weekend peak hour trips would translate to eight visitors during the weekday p.m. peak hour and six during the weekend midday peak hour. The expected daily maximum visitation to Jessel Gallery is eight persons. There are two full-time and one part-time staff members at the gallery. Finally, the Jessel Gallery holds an event on the First Monday of the month; this event is limited to 60 persons.

As proposed, the Prime Solum Tasting Room would have up to 125 visitors per day served by two full-time and eight part-time staff members. Visitation would be limited to 10 persons on the first Monday of the month to avoid conflict with the Jessel Art Gallery's "First Monday" event.

The capacity to accommodate left-turning traffic is based on an analysis of the hourly demand. To determine if the demand would result in a queue of more than one vehicle the anticipated arrival pattern was estimated for employees and visitors at both the Jessel Art Gallery and the proposed Prime Solum Tasting Room as well as the resident of the apartment. Arrivals were estimated for each hour of the day under conditions with a "First Monday"

event at Jessel Art Gallery and with full visitation on weekdays and weekends at Prime Solum. These values were then translated to the number of vehicles that would arrive on an hourly basis. As shown on the enclosed spreadsheets, the maximum number of vehicles that are expected to arrive at the site during any single hour is 14.

Consideration was given to the percent of project-generated traffic that would likely come from the southeast, making the left-turn movement that is the focus of this analysis. The counts taken at the driveway indicate approximately a 60/40 split (from the south/north) for the art gallery; however, winery visitors would be expected to come predominantly from the north where other wineries and most of the accommodations for winery visitors are located. The most convenient route for access from Silverado Trail is via Hardman Avenue to Atlas Peak Road. Although visitation is therefore expected to be weighted toward the north, it was conservatively assumed that trips would be evenly split between arrivals from the north (making a right turn into the site) and the south, making the inbound left-turn. Based on these occupancies, and assuming a 50/50 split as described above, the maximum number of left-turns expected during a single hour is seven.

Queuing Analysis

Storage demand in the left-turn pocket was determined using a methodology contained in "Estimating Maximum Queue Length at Unsignalized Intersections," John T. Gard, *ITE Journal*, November 2001. Traffic counts obtained at the driveway during the p.m. peak hour were factored up based on data available in the County's model to achieve potential future volumes, and even with these higher future volumes the projected queue with seven vehicles turning left into the site is zero (0). As shown on the enclosed spreadsheet, it was also determined that even assuming 100 percent of inbound trips make a left-turn, the queue would only extend to one vehicle, which can be accommodated in the available space.

Conclusions and Recommendations

- The existing stacking space for left-turns into the site's driveway is adequate for only one vehicle.
- The maximum number of inbound left-turns is seven, which is half of the total peak inbound volume of 14.
- Using projected future volumes at the driveway the anticipated queue with seven inbound trips is zero; the queue would increase to one vehicle if it were assumed that all of the 14 inbound trips arrived from the south.
- The existing left-turn storage area is adequate to accommodate the anticipated demand of all uses proposed at the Jessel Art Gallery and Prime Solum Tasting Room.

We hope this information sufficiently address any concerns regarding demand exceeding the capacity of the existing turn lane storage. Thank you for giving us the opportunity to provide these services.

Sincerely,

Dalene J. Whitlock, PE, PTOE
Principal

DJW/djw/NAX061-2.L1

Enclosures: Arrival Matrices
Left-turn Queue Worksheets

Copy to: Dr. George Monteverdi (via email)

Prime Solum and Jessel Art Gallery
Arrival Matrix

Scenario: With "First Monday" Event

	8-9 AM		9-10 AM		10-11 AM		11 AM-12		12-1 PM		1-2 PM		2-3 PM		3-4 PM		4-5 PM		5-6 PM		6-7 PM		7-8 PM		8-9 PM		Total Daily Visitors	Total Employees
	P	V	P	V	P	V	P	V	P	V	P	V	P	V	P	V	P	V	P	V	P	V	P	V	P	V		
Jessel Employees			2	*2*							1	*1*																3
Jessel Visitors					2	*1*	2	*1*			2	*1*	2	1	30	*12*	30	*12*									68	
Prime Solum Employees	4	*4*			2	*2*																						6
Prime Solum Visitors							3	*1*	4	*2*	3	*1*															10	
Residences																			1	*1*								
Total Inbound Vehicles		*4*		*2*		*3*		*2*		*2*		*3*		*1*		*12*		*12*		*1*		*0*		*0*		*0*		
Total Left-turns (50%)		**2**		**1**		**2**		**1**		**1**		**2**		**1**		**6**		**6**		**1**		**0**		**0**		**0**		

P = Persons (visitors) V= Vehicles

Prime Solum and Jessel Art Gallery
Arrival Matrix

Scenario: With Solum Weekday Event

	8-9 AM		9-10 AM		10-11 AM		11 AM-12		12-1 PM		1-2 PM		2-3 PM		3-4 PM		4-5 PM		5-6 PM		6-7 PM		7-8 PM		8-9 PM		Total Daily Visitors	Total Employees
	P	**V**	**P**	**V**	**P**	**V**	**P**	**V**	**P**	**V**	**P**	**V**	**P**	**V**	**P**	**V**	**P**	**V**	**P**	**V**	**P**	**V**	**P**	**V**	**P**	**V**		
Jessel Employees			2	*2*							1	*1*																3
Jessel Visitors					2	*1*	2	*1*			2	*1*	2	1													8	
Prime Solum Employees	4	*4*			2	*2*			1	*1*	1	*1*																8
Prime Solum Visitors													18	*7*	36	*14*	36	*14*	35	*13*							125	
Residences																			1	*1*								
Total Inbound Vehicles		*4*		*2*		*3*		*1*		*1*		*3*		*8*		*14*		*14*		*14*		*0*		*0*		*0*		
Total Left-turns (50%)		**2**		**1**		**2**		**1**		**1**		**2**		**4**		**7**		**7**		**7**		**0**		**0**		**0**		

P = Persons (visitors) V= Vehicles

Prime Solum and Jessel Art Gallery
Arrival Matrix

Scenario: With Solum Weekend Event

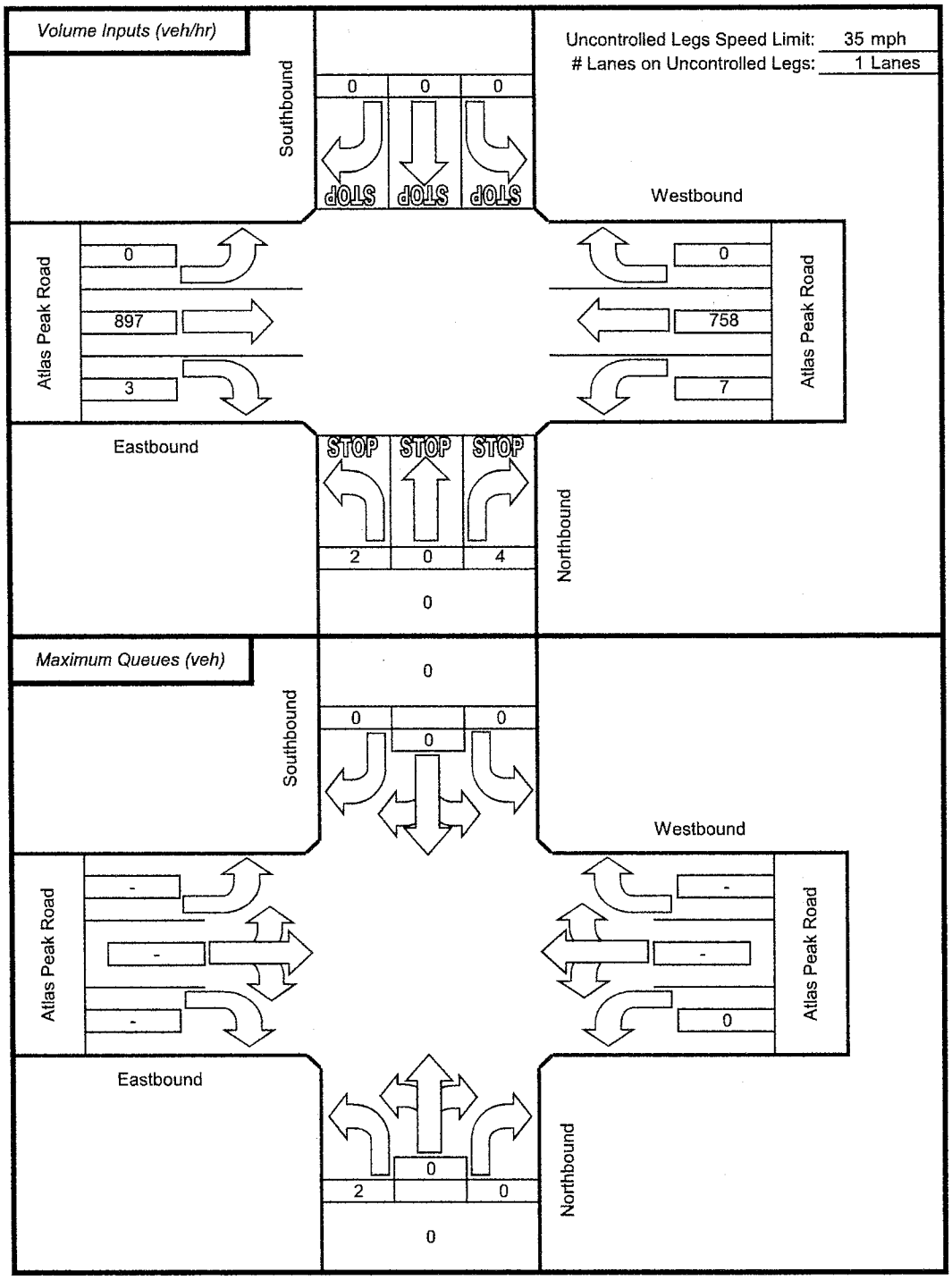
	8-9 AM		9-10 AM		10-11 AM		11 AM-12		12-1 PM		1-2 PM		2-3 PM		3-4 PM		4-5 PM		5-6 PM		6-7 PM		7-8 PM		8-9 PM		Total Daily Visitors	Total Employees
	P	V	P	V	P	V	P	V	P	V	P	V	P	V	P	V	P	V	P	V	P	V	P	V	P	V		
Jessel Employees			2	*2*							1	*1*																3
Jessel Visitors					2	1	2	1			2	*1*	2	1													8	
Prime Solum Employees	4	*4*			2	*2*			2	*2*	2	*2*																10
Prime Solum Visitors													18	*6*	36	*13*	36	*13*	35	13							125	
Residences																			1	*1*								
Total Inbound Vehicles		*4*		*2*		*3*		*1*		*2*		*4*		*7*		*13*		*13*		*14*		*0*		*0*		*0*		
Total Left-turns (50%)		**2**		**1**		**2**		**1**		**1**		**2**		**4**		**7**		**7**		**7**		**0**		**0**		**0**		

P = Persons (visitors) V= Vehicles

Maximum Queue Length
Two-Way Stop-Controlled Intersections

Through Street: Atlas Peak Road
Side Street: Prime Solum

Scenario: Future plus Project
Stop Controlled Legs: North/South

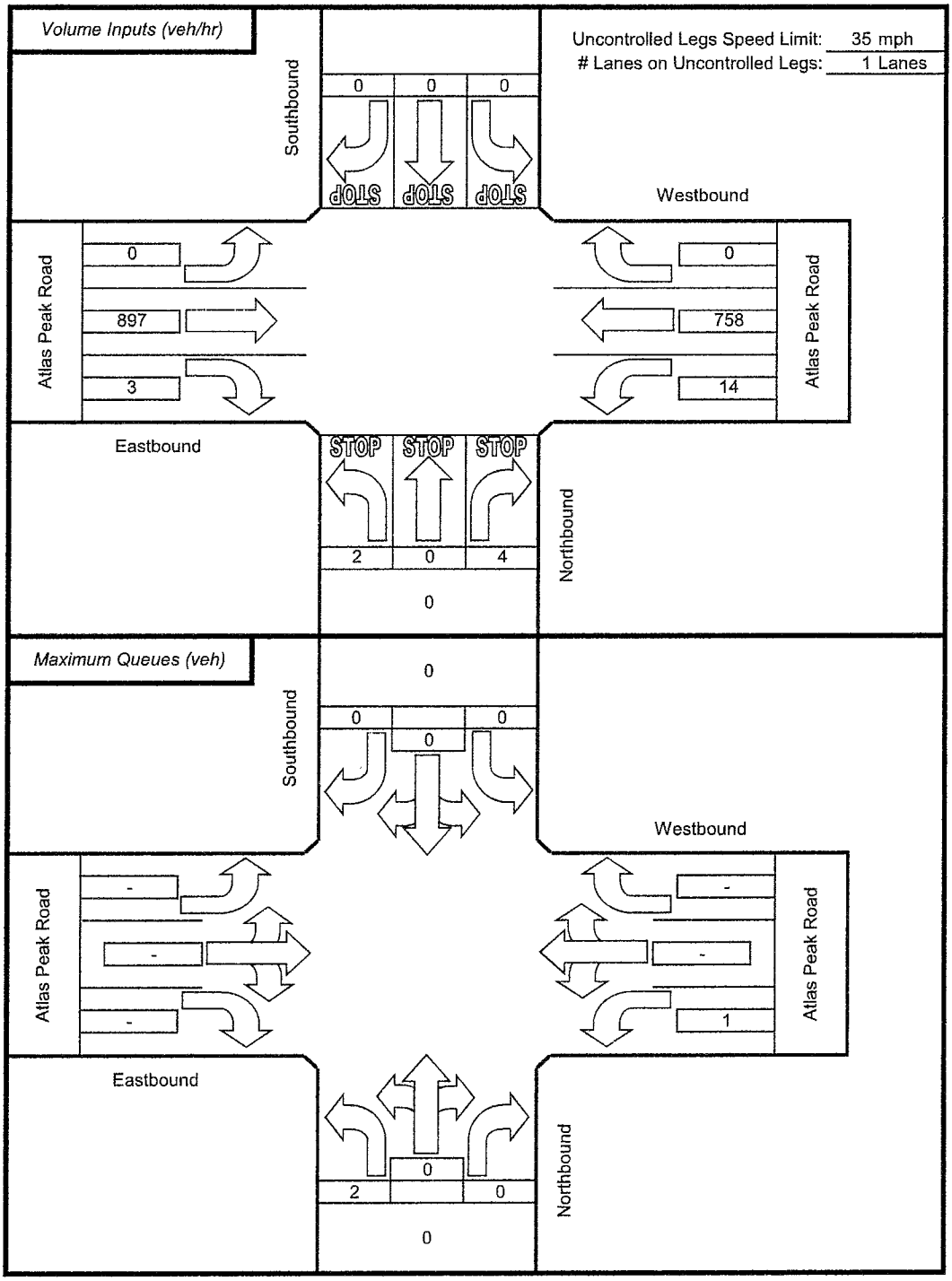


Source: John T. Gard, ITE Journal, November 2001, "Estimating Maximum Queue Length at Unsignalized Intersections"

Maximum Queue Length
Two-Way Stop-Controlled Intersections

Through Street: Atlas Peak Road
Side Street: Prime Solum

Scenario: Future plus 100% Project
Stop Controlled Legs: North/South



Source: John T. Gard, ITE Journal, November 2001, "Estimating Maximum Queue Length at Unsignalized Intersections"