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August 3, 1998

David Knight
Deputy Director of Public Works and Transportation
Sonoma County Department of Public Works and Transportation
575 Administration Drive, Room 117-A
Santa Rosa, CA 95403

SONOMA COUNTY DEPT.
DEPARTMENT OF PUBLIC WORKS AND TRANSPORTATION

Dear David,

Attached you will find a draft copy on *Winery Trip Generation* for your review. This information is intended to replace *Land Division Development Procedure LD No. 9* issued in 1992.

The information used in the analysis was derived from several sources. Among the sources are data furnished by Klein Family Vineyards and St. Francis Winery. I also incorporated information from *Stone Street Winery Traffic Impact Study* (January 2, 1998) and "Clos du Bois Winery Expansion Trip Generation Analysis" (July 1, 1998) by Whitlock and Weinberger Transportation Inc. which you furnished to me. I also reviewed the data collected by the County in the 1982 study on winery trip generation.

I believe the analysis represents a fair estimate on winery trip generation at various production levels. The attached table shows trip generation based on the existing policy and the proposed rates.

Please provide me with your comments so that I may incorporate them into the report.

A copy of this study is also being furnished to other interested parties for review and comment. Please furnish comments to:

Walter W. Laabs Jr., P.E.
Branch Manager
TJKM Transportation Consultants
141 Stony Circle, Suite 280
Santa Rosa, CA 95401

If you have any questions please do not hesitate to call me at (707) 575-5800.

Very truly yours,

Walter W. Laabs Jr., P.E.
Branch Manager
/kal

attachments

cc: John Kottage, Sonoma County Department of Public Works and Transportation
Mike Enright, Sonoma County Permit and Resources Management Department
Mike Morrison, Common Ground Land Planning Services
Pat McDowell, Klein Family Vintners
Lloyd Canton, St. Francis Winery
Randall Clifton, Kendall Jackson Vineyards and Winery
Tom Hobart, Clos du Bois Wines, Inc.
Steve Weinberger, P.E., Whitlock & Weinberger Transportation Inc.

Comparison of Average Daily Traffic at Various Production Levels

Annual Production (Cases)	Average Daily Traffic	
	Existing	Proposed
<i>Wineries with Tasting Rooms</i>		
10,000	49	90
20,000	67	131
100,000	181	177
500,000	751	343
1,500,000	2,176	484
2,000,000	2,889	523
<i>Wineries without Tasting Rooms</i>		
10,000	14	54
20,000	29	57
100,000	143	85
500,000	713	161
1,500,000	2,138	302
2,000,000	2,851	341

Source: TJKM Transportation Consultants (1998)

INTRODUCTION AND SUMMARY

Introduction

The production of wine is a major industry in Sonoma County. Each winery generates traffic on the County Road System. Wineries are expected to pay their fair share of traffic mitigation fees.

The Department of Public Works has developed a policy on trip generation rates for wineries. The policy was adopted in 1992. A review of the policy showed that it underestimated trips for smaller wineries and overestimated trips for larger wineries.

The purpose of this report is to provide a more realistic procedure for estimating winery traffic.

Summary

The analysis examined four components that make up winery trip generation: tasting room visitors, employee traffic, truck traffic and miscellaneous traffic.

Tasting Room Traffic. Small wineries can receive 40,000 visitors per year while larger wineries usually do not exceed 100,000 visitors per year. Wine tasting is a social activity; a vehicle occupancy rate of 3.0 persons per vehicle is reasonable.

Employee Traffic. There are economies of scale for larger wineries. As the size of the winery and production levels increase the rate of employee growth decreases.

Truck Traffic. There is a direct relationship between the trucks used in the production of wine. The number of trucks hauling grapes, bottles, barrels and wine is all related to production.

Visitors, Deliveries, Mail. All businesses receive a limited number of visitors and deliveries on a daily basis.

ANALYSIS

Tasting Room Traffic

The largest component of winery traffic is visitors to the tasting room. The number of visitors is dependent upon several factors including location of the tasting room relative to other wineries, location relative to high volume roads, and reputation of the winery.

There is a relationship between production and visitors. The smaller wineries attract more visitors per annual production than the larger wineries. Based on information taken from various sources the relationship between visitors and production shown in Table 1 has been established. The relationship is illustrated in Figure 1.

The relationship between visitors and vehicles is dependent upon the average vehicle occupancy. The County of Napa reports an average vehicle occupancy of 3.0 persons per vehicle. This mix is achieved with a mix of 50% vehicles with two occupants and 50% vehicles with four occupants. Since wine tasting is a social activity an occupancy rate of 3.0 persons per vehicle is reasonable.

The number of visitors on a given day fluctuates with the season and day of the week. The number of visitors in August is 150% of the average per year. Saturday traffic is 140% of daily traffic. However, the average daily traffic for visitors is based on the annual number of visitors. Average daily traffic is the annual number of visitors divided by 365 divided by average vehicle occupancy times two trips per vehicle.

Average daily traffic due to visitors to the tasting room for various production levels is also shown in Table I.

Table I

Tasting Room Visitor Traffic at Various Production Levels

Annual Production (Cases)	Annual Visitors	Average Daily Traffic
20,000	40,000	74
500,000	100,000	182
1,500,000	100,000	182

Source: TJKM Transportation Consultants (1998)

Employees

The second largest component of winery traffic is employee trips. Employees are found in five categories, *i.e.*, administrative, sales, production, cellar and vineyard.

A review of several traffic reports on wineries revealed that there are economics of scale for winery operations. The number of full time employees for various production levels is listed in Table II and shown in Figure 2.

Figure 1
Visitors vs. Production

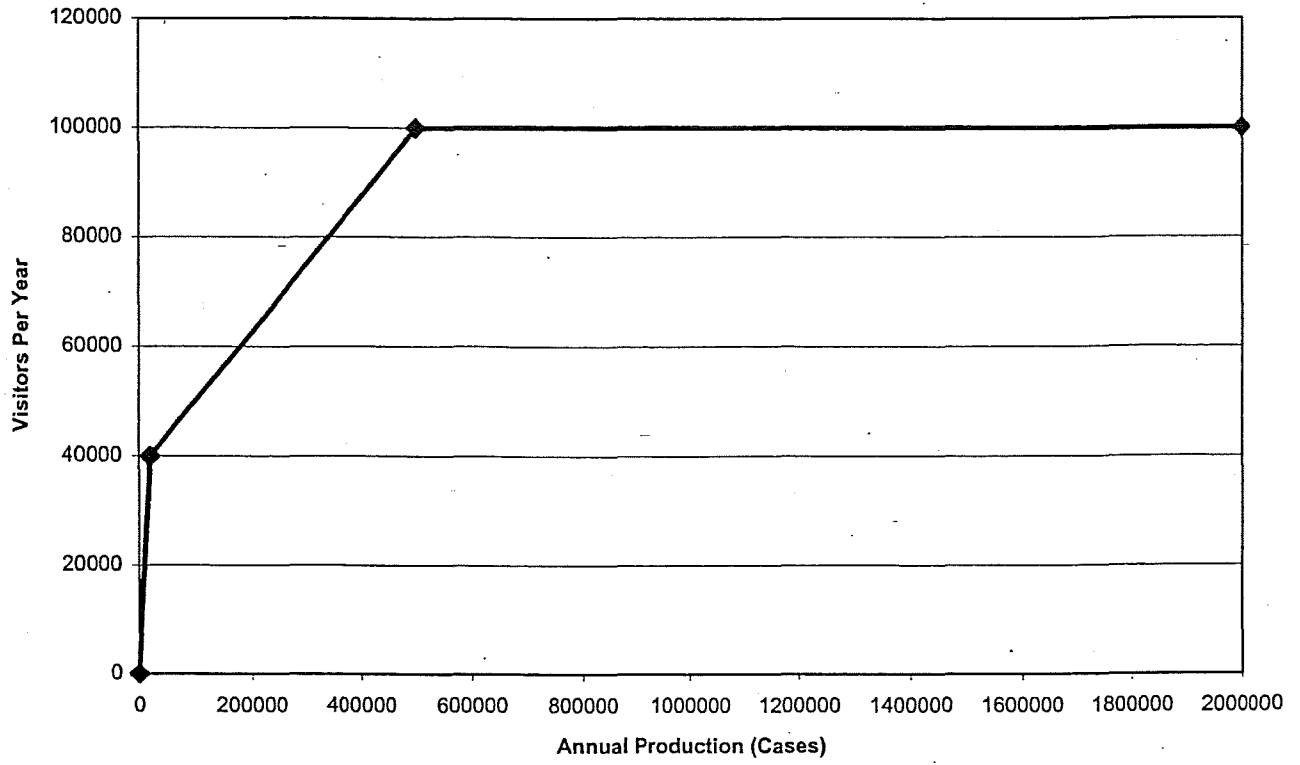
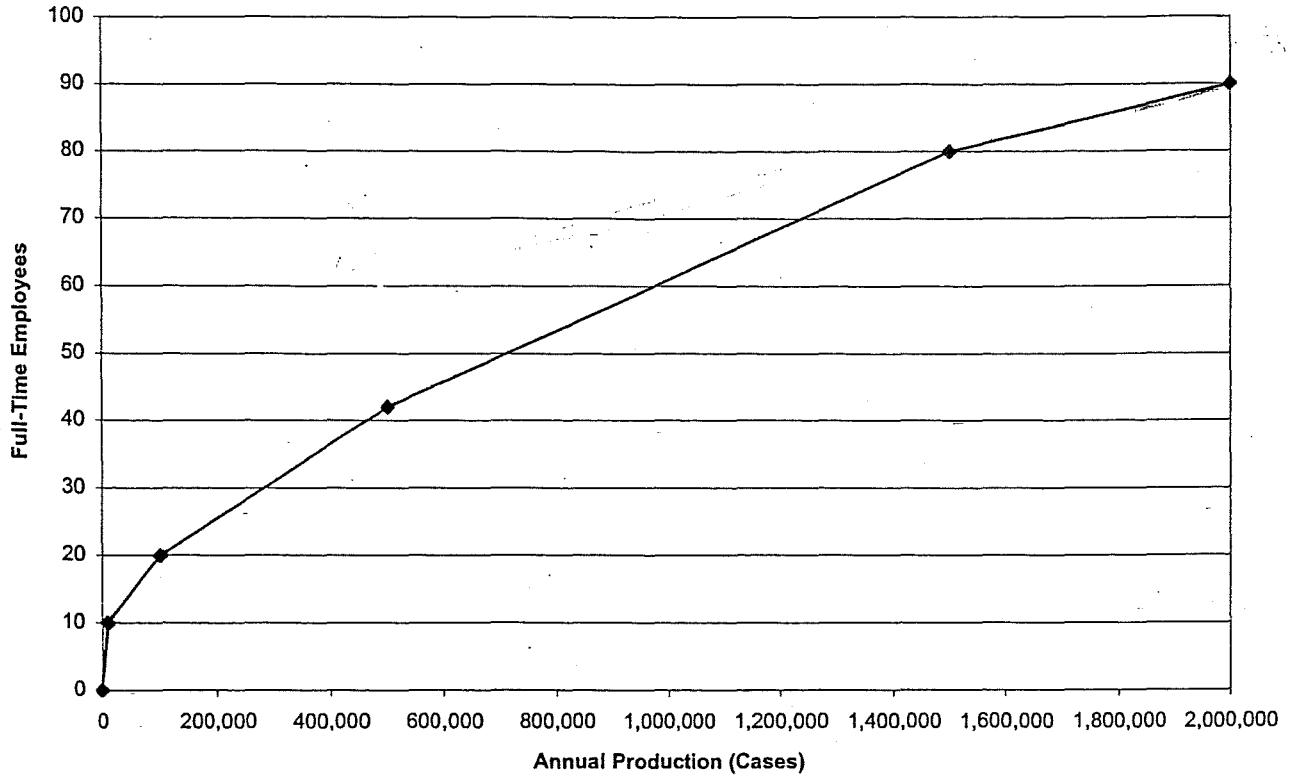


Figure 2
Employees vs. Production



Seasonal employees are used during the peak bottling period before harvest and during the harvest. On the average seasonal employment is about 17% of full time employment. Seasonal employment can range from two months to six months, an average of four months. The number of seasonal employees and the full time equivalent is also shown in Table II.

Employees trips are estimated at 3.0 trip ends per employee. This is derived from using 10% carpooling for the home to work trips, 50% carpooling for the lunch trips and 0.2 trips per employee for errands and other business trips.

Average daily traffic due to employees is also shown in Table II.

Table II
Employee Traffic at Various Production Levels

Annual Production (Cases)	Full Time Employees	Seasonal Employees	Duration	FTE*	Average Daily Traffic
10,000	10	2	4 months	11	53
100,000	20	3	4 months	21	83
500,000	42	7	4 months	44	152
1,500,000	80	14	4 months	85	275
2,000,000	90	15	4 months	95	305

*FTE=Full Time Equivalent

Source: TJKM Transportation Consultants (1998)

Truck Traffic

Truck traffic varies with the season. During the harvest season, which runs about eight weeks between late August and late October, trucks import grapes to the winery. The amount of grapes required for wine is dependent upon the annual production.

Depending upon the grape variety, 1 ton of grapes will yield between 140 and 160 gallons of wine. One case of wine typically contains 12 750-liter bottles of wine or 9 liters of wine. One case therefore equals 2.376 gallons of wine. One ton of grapes will produce between 59 and 67 cases of wine. For planning purposes a figure of one ton of grapes yields 60 cases is used.

Grapes are usually delivered in double gondola trucks carrying 22 tons of grapes each, or on flat bed trucks carrying 11 tons of grapes each. In order to estimate the number of trucks required to deliver grapes a truck composition of 80% gondola trucks and 20% flat bed trucks is used. On the average each truck hauling grapes will carry 19.8 tons of fruit.

At a yield of about 60 cases per ton and an average load of about 20 tons per truck, one truck of grapes is needed for every 1,200 cases of wine produced.

During the harvest the pomace from the production of juice from grapes requires disposal. One truck is needed for each 100 tons of grapes processed or one truck for every 6,000 cases of wine. In some

wineries the pomace is used in the vineyard.

Clean bottles are required for the wine and the finished product must be shipped to a distributor or warehouse. One truck can carry about 2,500 cases of glass. The finished product requires one truck for about 1,250 cases of wine. Cases of wine weigh more than empty bottles. In addition, many partial shipments are made where trucks are not completely loaded. New barrels are needed as replacements. One truck delivering barrels is needed for every 12,500 cases of production. Miscellaneous deliveries include corks, labels, and other items to make the wine. One miscellaneous truck is needed for every 15,000 cases of production.

The number of weekday truck trips is the total annual number of trucks divided by 261 weekdays per year multiplied by two trips (one inbound and one outbound) per truck.

Table III is a summary of the truck requirements for a typical winery.

Table III

Assumptions Used for Truck Traffic

1 case = 12*.750 liters =	9	liters
1 liter =	1.056	quarts
9 liters =	9.504	quarts
=	2.376	gallons
1 ton of grapes yields	140-160	gallons of wine
1 ton of grapes yields	59-67	cases of wine
1 20-ton grape truck yields	1,200	cases of wine
1 truck disposing pomace required for	6,000	cases of wine
1 truck delivering glass required for	2,500	cases of wine
1 truck shipping wine required for	1,250	cases of wine
1 truck for delivery and disposal of barrels required for	12,500	cases of wine
1 truck for delivery of miscellaneous items required for	15,000	cases of wine
	261	weekdays per year
	2	trips per truck

Source: TJKM Transportation Consultants (1998)

Visitors, Deliveries, Mail

In addition to the trucks related to production, visitors including mail and other deliveries are estimated at 10 vehicles or 20 trips per day, irrespective of the size of the facility.

Table IV

Average Daily Traffic at Various Production Levels

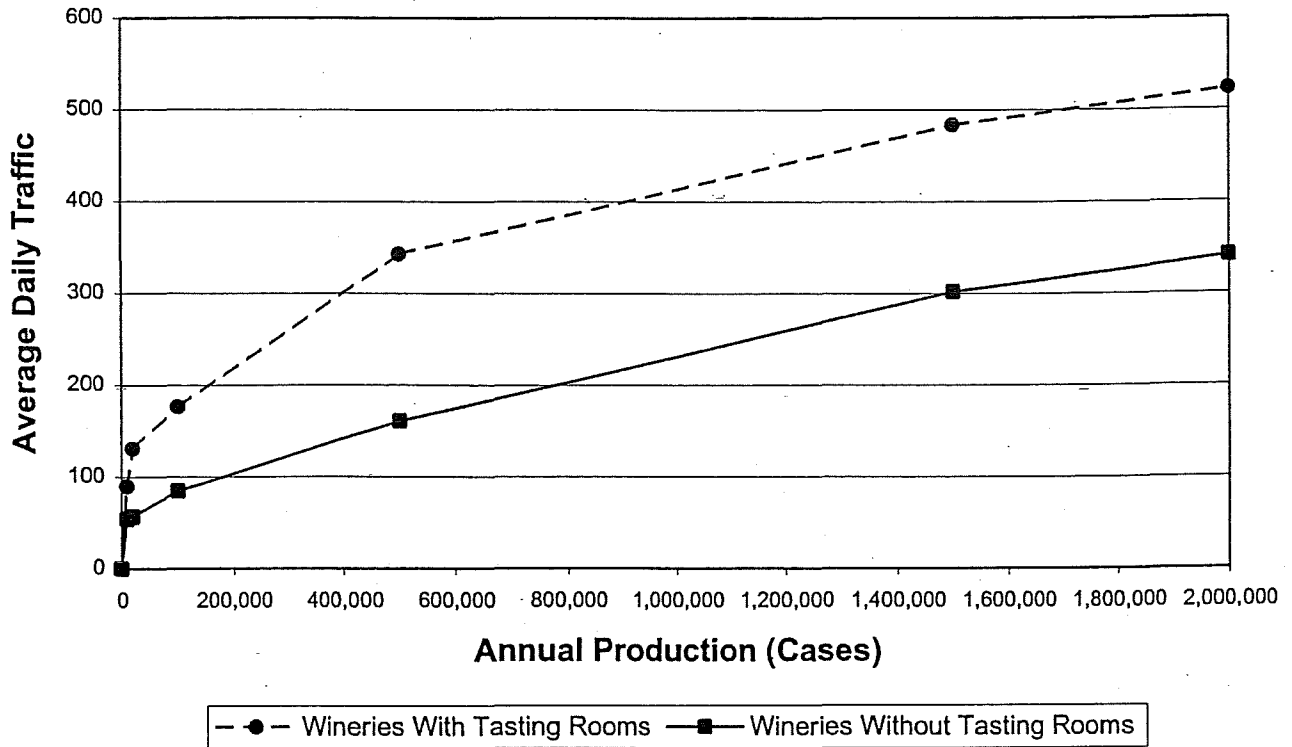
Annual Production (Cases)	Tasting Room Traffic	Employee Traffic	Truck Traffic	Visitors Deliveries Mail	Average Daily Traffic
<i>Wineries with Tasting Rooms</i>					
10,000	36	33	1	20	90
20,000	74	36	1	20	131
100,000	92	63	2	20	177
500,000	182	132	9	20	343
1,500,000	182	255	27	20	484
2,000,000	182	285	36	20	523
<i>Wineries without Tasting Rooms</i>					
10,000	0	33	1	20	54
20,000	0	36	1	20	57
100,000	0	63	2	20	85
500,000	0	132	9	20	161
1,500,000	0	255	27	20	302
2,000,000	0	285	36	20	341

Source: TJKM Transportation Consultants (1998)

A worksheet to calculate future trip generation of a winery is attached.

A spreadsheet to assist calculations is available.

Figure 3
Average Daily Traffic vs. Annual Production



**COUNTY OF SONOMA
DEPARTMENT OF PUBLIC WORKS**

WINERY TRIP GENERATION ESTIMATE				
				Date: _____
Annual Production _____	Cases per year	Tasting? Yes: _____ No: _____		
<i>Wineries with tasting</i>				
0-10,000	Cases @	9.0	trips per 1,000 cases	_____
10,000-20,000	Cases @	4.1	trips per 1,000 cases	_____
20,000-100,000	Cases @	0.575	trips per 1,000 cases	_____
100,000-500,000	Cases @	0.415	trips per 1,000 cases	_____
500,000-1,500,000	Cases @	0.141	trips per 1,000 cases	_____
1,500,000+	Cases @	0.078	trips per 1,000 cases	_____
			Total	_____ trips per day
<i>Wineries without tasting</i>				
0-10,000	Cases @	5.4	trips per 1,000 cases	_____
10,000-20,000	Cases @	0.30	trips per 1,000 cases	_____
20,000-100,000	Cases @	0.35	trips per 1,000 cases	_____
100,000-500,000	Cases @	0.19	trips per 1,000 cases	_____
500,000-1,500,000	Cases @	0.141	trips per 1,000 cases	_____
1,500,000+	Cases @	0.078	trips per 1,000 cases	_____
			Total	_____ trips per day