w-trans

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January 14, 2008

Mr. Bud Kamb
P.O. Box 323
Little River, CA 95456-0323

Traffic Study for the Jackson-Grube Family Inn in the County of Mendocino

Dear Mr. Kamb;

As requested, Whitlock & Weinberger Transportation, Inc. (W-Trans) has completed a traffic analysis for the proposed inn at 31502 North Highway One in the County of Mendocino. The focus of this traffic analysis was on the potential impacts of the project on State Route 1 on motorists as well as bicyclists.

Project Description

The project site is located on the west side of State Route (SR) 1 approximately four miles south of Westport. There are currently several residential buildings and related out buildings on the 400+ acre site.

The proposed project consists of a 10-unit inn to be built in phases. Phase I consists of demolition and reconstruction of the former Orca Inn into a main unit with two guest units and a manager's unit, an equipment barn, a maintenance shop, and a generator/pump shed. Phase II consists of seven guest units, including three in the main building, two with a detached bunkhouse and two separate cottages. A small spa building is also proposed within the approximate 3.7-acre area of development.

Existing Traffic Conditions

SR 1 in this rural area is a 2-lane undivided highway, with two 10-foot travel lanes and a gently rolling topography, including occasional vertical and horizontal curves. It has a posted speed limit of 55 mph. There are very few street intersections, no street lighting, and no pedestrian or bicycle facilities.

The existing project access is on the west side of SR 1 and is currently gated approximately 40 feet west of the edge of pavement with a split rail fence installed within the driveway approach areas. The approach is more than 40 feet wide at the edge of pavement which provides ample width for 2-way traffic into and out of the site. The main entry drive leads to a parking area.

Existing traffic volumes on SR1 are published by Caltrans. Based upon available information it is estimated that in the area near the project site (Post Mile 72.32) SR 1 carries approximately 2,360 vehicles per day, including 420 trips in the weekday p.m. peak hour. Methodologies for analyzing roadway capacity are contained in the *Highway Capacity Manual* (HCM), Transportation Research Board, 2000. This reference

manual notes that the ideal capacity of a two-lane highway is 3,200 passenger cars per hour (pc/h), and 1,700 pc/h for each direction. SR 1 in this area is not estimated to be carrying this volume of traffic in a *day*, and therefore it is reasonably assumed that the existing highway facilities adequately accommodate existing traffic volumes.

Collision History

The collision history for the area was reviewed to determine any trends or patterns that may indicate a safety issue. Collision rates were calculated based on records for 2002 through 2004 obtained from the California Highway Patrol and published in their SWITRS reports. There were three reported collisions during this time period along SR 1 within one-half mile in either direction of the project site, translating to a calculated collision rate for this segment of 0.80 collisions per million vehicle miles driven (c/mvm). The average collision rate for similar facilities statewide, as indicated in *2002 Accident Data on California State Highways*, California Department of Transportation, is 0.80 c/mvm. The collision rate is identical to the average rate for similar types of roadway segments. This indicates that the roadway is experiencing collisions at a rate that is consistent with similar facilities, and coupled with the low number of collisions, it can be concluded that there are no identifiable safety issues on this road segment.

Project Traffic Conditions

Trip Generation

The anticipated trip generation for the proposed project was estimated using standard rates published by the Institute of Transportation Engineers (ITE) in *Trip Generation*, 7th Edition. The trip generation potential of the project as planned was developed using the published standard rates for Resort Hotel (Land Use #330) as the description most closely matches the currently proposed project. The Resort Hotel land use is described by ITE as:

> *...similar to hotels in that they provide sleeping accommodations, restaurants, cocktail lounges, retail shops and guest services. The primary difference is that resort hotels cater to the tourist and vacation industry, often providing a wide variety of recreational facilities/programs (golf courses, tennis courts, beach access, or other amenities) rather than convention and meeting business. Resort hotels are normally located in suburban or outlying locations on larger sites than conventional hotels.*

It should be noted that another closely matching description for this project is the ITE Land Use #311, All Suites Hotel. The description for this land use by ITE notes:

> *All suites hotels are places of lodging that provide sleeping accommodations, a small restaurant and lounge and a small amount of meeting space. Each suite includes a sitting room and separate bedroom; often, limited kitchen facilities are provided within the suite. These hotels are located primarily in suburban areas.*

While this also closely aligns with the project description, though the project is not located in a suburban area, the trip generation rate is slightly lower for the "All Suites Hotel" land use than for a Resort Hotel. To be conservative, the higher rate trip generation category, Resort Hotel, was used.

The ITE rates for Resort Hotels are based on a variety of parameters, including the total number of rooms. Based on the application of this variable, the proposed project is expected to generate an average of 70 daily trips, including four trip ends during the a.m. peak hour and four trip ends during the p.m. peak hour. These results are summarized in Table 1.

Table 1
Trip Generation Summary

Land Use	Units	Daily		AM Peak Hour				PM Peak Hour			
		Rate	Trips	Rate	Trips	In	Out	Rate	Trips	In	Out
Resort Hotel	10 rooms	7.0	70	0.41	4	3	1	0.42	4	2	2

Trip Distribution

The pattern used to distribute new project trips to the street network was determined by reviewing existing traffic volumes on SR 1 near the site's existing entrance based as published by Caltrans. Based on current volume patterns it was assumed that 75 percent of the project trips would approach to/from the south (toward Fort Bragg) and 25 percent to/from the north (toward Westport). Specifically, in the a.m. peak hour, of the four project trips generated, two trips would be expected to arrive from the south and one from the north, and one trip would be expected to depart the site heading south on Route 1. Similarly, in the p.m. peak hour, the two inbound trips and the two outbound trips would be expected to arrive and depart from/to the south.

Future Traffic Conditions

The future traffic volumes for this study were developed based on the Caltrans District 1 growth factors for State Highways in the district. Caltrans District 1 has developed growth factors for all of the State Highways in the District based on population projections. The last update was in May 2002. For Highway 1, Caltrans has determined that traffic volumes would be expected to increase by a factor of 1.10 over the next 20-year period, or one-half percent annually. This factor was therefore applied to the existing traffic volumes in order to obtain projected future.

Using this approach, it is estimated that the daily volume on site SR near the project site is expected to increase to approximately 2,600 daily trips and 470 weekday p.m. peak hour trips by 2027. As note above, the ideal capacity of a two-lane highway is noted in the HCM as 3,200 passenger cars per hour (pc/h), and 1,700 pc/h for each direction. Highway One in this area is not estimated to be carrying this volume of traffic in a *day*. It can reasonably be assumed, therefore, that Highway 1 will continue to operate acceptably within the existing highway lane configuration under these future traffic volumes, with no widening or additional capacity needed.

Sight Distance

Sight distance is the continuous length of highway visible to the driver. Minimum corner sight distance criteria are contained in the Caltrans *Highway Design Manual*. Corner sight distance for private road

intersections should equal the stopping sight distance, which is the criterion applied, and is described as follows:

> *The minimum stopping sight distance is the distance required by the driver of a vehicle, traveling at a given speed, to bring the vehicle to a stop after an object on the road becomes visible. Stopping sight distance is measured from the driver's eyes, which are assumed to be 3½ feet above the pavement surface, to an object ½-foot high on the road.*

The minimum corner sight distance needed for a road with a design speed of 55 mph is 500 feet. Using the original site plan, sight distance was measured at the existing driveway. Sight distance from the existing driveway to the south was measured at more than 1,100 feet. At the driveway looking north, drivers have approximately 450 feet sight distance, which is less than the minimum suggested. In order to gain adequate minimum sight distance, the project driveway would have to be relocated farther south.

Under the current plan, the project access driveway is proposed to be located approximately 100 feet south of the existing driveway, per a site plan entitled *Encroachment Approach (Concept Sketch) for Inn at Newport Ranch* and dated January 10, 2008. A line of sight from the proposed location to the north is noted on the plans as "+/- 530 feet sight distance." This is consistent with field measurements completed as part of this study, and would exceed the minimum sight distance requirements. Additionally, given the excellent sight distance to the south, such a driveway approach relocation will not affect the adequacy of sight distance in that direction.

The proposed driveway concept also includes eliminating the existing driveway access, with configuration of the new driveway shown in a curvilinear nature in order to tie into the existing driveway location approximately 100 feet from the roadway (west). This design would ensure eliminating any possible use of the sight-restricted access location.

Need for Left-Turn Lane or Right-Turn Lane

The need for left-turn or right-turn channelization on SR 1 at the project driveway was evaluated based on criteria contained in the *Intersection Channelization Design Guide*, National Cooperative Highway Research Program (NCHRP) Report No. 279, Transportation Research Board, 1985, as well as a more recent update of the left-turn channelization methodology developed by the Washington State Department of Transportation. The NCHRP report references a methodology developed by M. D. Harmelink that includes equations that can be applied to expected or actual traffic volumes in order to determine the need for a turn pocket based on safety issues. Based on our research and discussions with Caltrans staff, this methodology is consistent with the "Guidelines for Reconstruction of Intersections," August 1985, which is referenced in Section 405.2, Left-turn Channelization, of the Caltrans *Highway Design Manual*.

Using the future peak hour traffic volumes noted above together with anticipated traffic associated with the project of two left-turning trips inbound at the project driveway during the evening peak period, a northbound left-turn pocket on SR 1 is not warranted. To be conservative, the two inbound trips were also assumed to be arriving from the north, so turning right into the site. Based on the analysis performed, a southbound right-turn pocket is also not warranted. Since neither the left-turn or right-turn pockets is

warranted, installation is not recommended. Copies of the worksheets used for these left-turn lane and right-turn lane warrant analyses are enclosed for reference.

Bicycle Facilities

Bike facilities, if installed, should occur within the context of a larger project to provide connectivity to other bicycle or pedestrian facilities. However, no such facilities are recommended for installation as part of this project, as providing such facilities along this project highway frontage at this time would serve no helpful purpose. If the right-of-way width is currently insufficient to accommodate future widening for bike facilities, adequate width should be dedicated.

Conclusions and Recommendations

- The segment of SR 1 near the project site currently carries approximately 2,360 vehicle trips per day, and is operating acceptably based on a review of both volumes and the collision history.

- The proposed project is expected to generate an average of four new trips during the a.m. and p.m. peak hours on weekdays.

- Adequate corner sight distance is available from both the existing and proposed project access points *to the south*. While sight distance is inadequate for traffic approaching *from the north* at the existing driveway, the proposed relocated access will increase the sight distance to 530 feet. The proposed location would exceed the minimum sight distance requirements for both approaches for the 55 mph speed of traffic on SR 1, providing a safer access than currently exists.

- The existing driveway should be removed at the time the proposed driveway is constructed, to prevent continued use.

- Based on the estimated volume of northbound left-turning vehicles during the p.m. peak hour a left-turn pocket is not warranted on SR 1 at the project driveway; one is therefore not recommended. Likewise, a right-turn lane is neither warranted nor recommended.

- Bicycle facilities are not present on SR 1 at this time, and should be installed as part of a larger project that would provide continuous facilities along the highway. Adequate right-of-way should be dedicated by the project, if appropriate.

We hope this information adequately addresses the project's potential impacts. Please call me if you have any questions regarding this analysis.

Sincerely,

Mary Jo Yung, P.E., PTOE
Associate

MJY/mjy/MEX067.L1.wpd

Enclosures: Left-Turn Lane and Right-Turn Lane Warrants

LEFT TURN LANE
WARRANT ANALYSIS

Study Intersection N. Highway One/Driveway at 31502

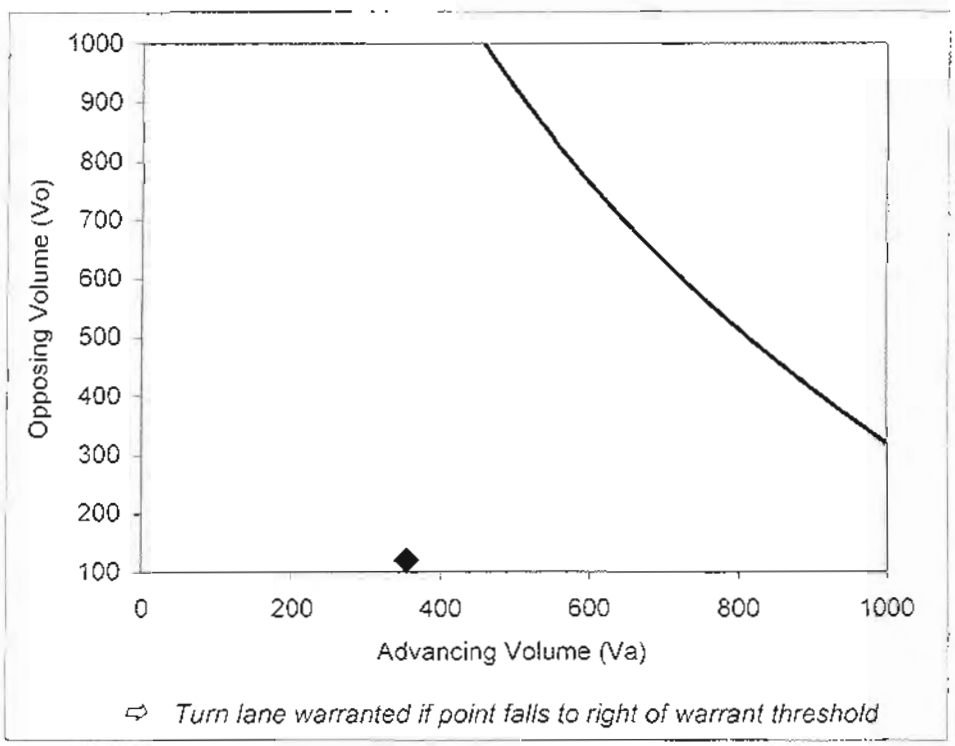
Study Scenario Future + Project (weekday p.m. peak)

threshold

INPUT		
Advancing Volume	Va	354
Opposing Volume	Vo	120
Left Turn Volume	Vl	2
Speed	SP	55 MPH
Two-Lane Undivided Highway		

Percentage Left Turns	%lt	0.6 %
Advancing Volume Threshold	AV	1258

If AV<Va then warrant is met



Warrant Threshold for 0.6% left turns and speed of 55

◆ Study Intersection

Left Turn Lane Warranted	NO

Methodology based on Washington State Transportation Center Research Report *Method For Prioritizing Intersection Improvements*, January 1997. The left turn lane analysis is based on work conducted by M.D. Harmelink in 1967, and modified by Kikuchi and Chakroborty in 1991

RIGHT TURN LANE
WARRANT ANALYSIS

Study Intersection	Main Street	N. Highway One
	Side Street	Driveway at 31502
Study Scenario	Scenario	Fut.+ Proj.(wkdy pm peak)

INPUT		
Advancing Volume	Va	120
Right Turn Volume	V_{RT}	2
Speed	SP	55 MPH
Two-Lane Undivided Highway		

RIGHT TURN LANE WARRANTS

1. Check for right turn volume criteria — NOT WARRANTED
   Less than 40 vehicles

2. Check advance volume threshold criteria for turn lane
   Advancing Volume Threshold AV -
   If AV<Va then warrant is met -

Right Turn Lane Warranted	NO

RIGHT TURN TAPER WARRANTS
(evaluate if right turn lane is unwarranted)

1 Check taper volume criteria — NOT WARRANTED
Less than 20 vehicles

2. Check advance volume threshold criteria for taper
   Advancing Volume Threshold AV = -
   If AV>Va then warrant is met -

Right Turn Taper Warranted	NO

Methodology based on Washington State Transportation Center Research Report *Method For Prioritizing Intersection Improvements*, January 1997. The right turn lane and taper analysis is based on work conducted by Cottrell in 1981