



**COUNTY OF EL DORADO
DEPARTMENT OF TRANSPORTATION
INTEROFFICE MEMORANDUM**

Date: January 8, 2020

To: File

From: Natalie K. Porter, P.E., T.E.
Senior Traffic Engineer

Subject: *Bass Lake Road Traffic Data Addenda*

BACKGROUND

At Planning Commission and Board of Supervisors hearings, concerns have been raised about Bass Lake Road as it relates to PD18-0005/TM18-1536/Serrano Village J7.

Bass Lake Road is identified in the El Dorado County General Plan Transportation and Circulation Element as a Major two-lane road within the Community Region Boundary, approximately north of Old Bass Lake Road. Also included on *Figure TC-1, Circulation Map for the El Dorado County General Plan* is a table entitled "2035 and Potential Future Roadway Facilities" which identifies Bass Lake Road between U.S. Highway 50 and Silver Springs Parkway as a four-lane divided road in the future beyond 2035.

In the DOT Bass Lake Road Traffic Data memo dated October 21, 2019, DOT concluded that the existing two-lane Bass Lake Road is sufficient to maintain the necessary level of service based on existing traffic counts and projections through 2035. That October 21, 2019 memo also stated that "the intersection of Bridlewood Drive does warrant a left turn pocket for the PM peak hour under existing conditions without the project." This memo provides additional traffic engineering information about this statement and should be used in conjunction with the original memo. As stated in the October 21, 2019 memo, Serrano Village J7 is estimated to increase trips passing Bridlewood Drive by only 13 trips or approximately 1.4% of the total PM peak hour trips. Based on the latest count data, only about 5% of the trips on Bass Lake Road at Bridlewood Drive are from the entire Serrano development in the AM peak hour, and 6% in the PM peak hour.

DISCUSSION

Warrants

A "warrant" is a set of criteria that can be used to define the relative need for, and appropriateness of, a particular traffic control device (e.g., STOP or YIELD sign, traffic signal,

left-turn pocket, etc.). Warrants are usually expressed in the form of a numerical requirement such as the volume of vehicular or pedestrian traffic.

Warrants should be viewed as guidelines, not as a final determination. The warrant analysis process is just one of the tools to be used in determining if a traffic signal is necessary. The Manual of Uniform Traffic Control Devices – California Edition (CA MUTCD) states, “Satisfaction of one or more warrants does not in itself require the installation of a traffic signal” and “an engineering study of traffic conditions, pedestrian characteristics, and physical characteristics of the location shall be performed to determine whether installation of a traffic control signal is justified at a particular location.” However, a traffic signal should not be installed if it does not satisfy any of the warrants.

El Dorado County has used the American Association of State Highway and Transportation Officials (AASHTO) Green Book and the National Cooperative Highway Research Program 457 (NCHRP) *Evaluating Intersection Improvements: An Engineering Study Guide* to evaluate if a location warrants a left turn pocket. As is reflected in the title of NCHRP 457, the methodology cited is technical guidance and not a mandate. In the Application section under “Add a Left-Turn Bay on the Major Road,” the report states, “The guidance stated in the preceding section defines the conditions that **may** justify the provision of a left-turn bay. Additionally, it says, “If the advancing and opposing volume combination intersects above or to the right of this trend line, a left-turn bay **should be** considered for the subject approach.” (**emphasis added**).

The left-turn pocket warrant methodology considers the following inputs:

- Posted Speed
- Peak hour left-turn movement volume
- Peak hour volume in same direction as left-turn movement (Advancing Volume – V_A)
- Peak hour volume in opposite direction as left-turn movement (Opposing Volume – V_O)
- Left-turn movement peak hour volume as a percentage of V_A

The table below summarizes the inputs used for the evaluation of the left-turn pocket into Bridlewood Drive for PM peak hour conditions, which represents the highest peak hour for the left-turn movement.

The values in the table were entered into the NCHRP 457 left-turn warrant model for a two-lane roadway with a posted speed limit of 40 miles per hour. The intersection of V_O and V_A is plotted on the model below and shown with a star. As shown, the intersection of V_O and V_A is right of the line that would represent 11% of left turns in V_A . Therefore, a southbound left-turn pocket is warranted.

NCHRP 457 MODEL INPUTS – BASS LAKE ROAD / BRIDLEWOOD DRIVE	
Input	PM Peak Hour Value
Advancing Volume (V_A)	312
Left Turn Volume	34
% Left-turns in V_A	11%
Opposing Volume (V_O)	579

Source: Fehr & Peers, 2019

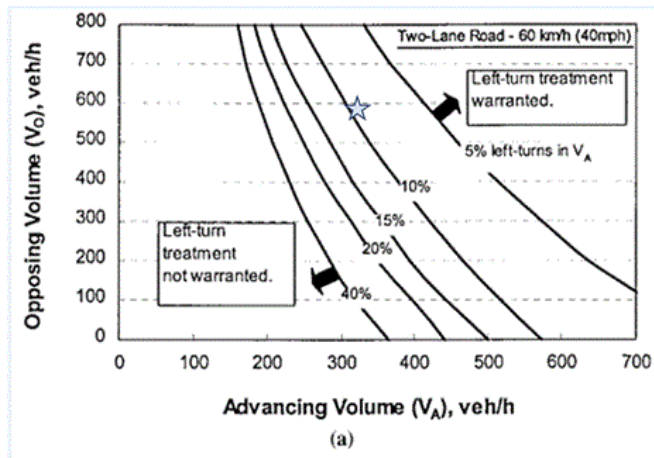


Figure 2-5 (a) – Guidelines for determining the need for a major-road left-turn bay at a two-way stop controlled intersection

The September 2019 p.m. peak counts collected for the intersection of Bass Lake Road and Bridlewood Drive are graphically shown above. It should be noted that the graphic shows the count data very close to the line that delineates meeting the guideline for installation of a left turn pocket. It is commonly acknowledged that traffic volumes fluctuate on a daily basis. The County will continue to monitor the intersection.

The NCHRP 457 cited the need for an engineering study to “encourage consideration of the full range of intersection improvement alternatives and selection of the most effective alternative for implementation.” This would include consideration of alternatives such as restricting turns in and out of any subdivision along Bass Lake Road, the installation of a roundabout, and the accompanying projections and intersection analysis of what occurs after installation of a particular improvement. Non-capacity traffic related improvements are not funded through the Traffic Impact Mitigation (TIM) Fee Program. Without a mechanism for reimbursement, it

would be difficult for the County to require a developer to fund an engineering study that exceeds the developer's impacts.

Safety

The County of El Dorado's Department of Transportation (Transportation) receives calls from citizens about locations of concern regarding traffic safety. The Traffic Operations staff then does the following to respond to the calls.

- 1) Issue Identification: research facts and data, such as volumes, speeds, warrant analysis; look at the physical environment, such as the roadway configuration, sight distance, etc. and what might be causing or contributing to the concern.
- 2) Safety Review: research collision data, does the intersection or road segment operate safely? What types of collisions are occurring? What are the causes of the collisions and what is the frequency of the collision?
- 3) Engineering Analysis: if a problem is identified, what are the ranges of options available? What are the future plans for the roadway(s); can an improvement be incorporated into a future project? Identify all options such as turn restrictions, turn pockets, roundabouts.
- 4) Funding: Traffic Operations can install signage and minor striping changes, any identified improvement beyond that requires a capital improvement. A capital improvement requires a funding source in order to be included in the Capital Improvement Program (CIP). Transportation staff does try to maximize the use of grant funding; however, safety programs are typically very competitive.

Transportation's Traffic Operations staff maintains a collision database for the County's 1,082.77 miles of maintained roads. The sole source of all reported collisions is the California Highway Patrol (CHP). Collisions or accidents per Million Entering Vehicles (Acc/MEV) are used to compare the frequency of collisions. This rate indicates the frequency of collisions in relation to the traffic volume during a specified period of time. A benchmark of 1.00 Acc/MEV is the County's accepted rate for single sites, such as an intersection or an individual curve. Any site with an accident rate of 1.00 or above will be considered for additional action.

For the road segment between Serrano Parkway/Sienna Ridge Road to Bridlewood Drive, the accident rate, for a five year period between 2014 and 2018, is 0.74 per million entering vehicles. This does not exceed the 1.00 rate benchmark to be considered for additional action.

For the intersection of Bass Lake Road at Bridlewood Drive for the time period between 2014 and most of 2019, there were a total of five (5) reported accidents, with one being a DUI. The accident rate is 0.24 per million entering vehicles.

Transportation does apply for state and federal grants to improve the safety of the County's maintained roads. However, these grants have stringent requirements that could be difficult for the Bass Lake Road segments to meet. One such program is the state's Highway Safety Improvement Program (HSIP). Requirements in the application include reporting the crash data in terms of number of crashes, not the number of injuries and fatalities, and must have a minimum three (3) years and maximum five (5) years of data. Detailed engineer's estimate and

project cost estimate must also be included. The crashes and the cost for the proposed improvement are used to calculate the benefit/cost ratio. Applications for funding are very competitive and a high benefit/cost ratio must be shown to be considered for funding.

Conclusion

The intersection of Bridlewood Drive and Bass Lake Road does meet the left-turn pocket warrant analysis. However, the intersection barely meets the warrant threshold and the intersection does still appear to be operating safely based on the collision analysis. In addition, staff and an outside consultant have done site visits and find no physical issues that need to be corrected at this time. Transportation has determined that it is not appropriate at this time to install a left turn pocket based on the volumes and the lack of accident history. Staff recommends that the intersection continues to be monitored to determine when improvements may be justified and to determine the nature and scope of the improvements.