

**APPENDIX C**  
**MEMORANDUM FROM DKS ASSOCIATES ON CITY OF ROCKLIN**  
**LOS IMPACT THRESHOLD**

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## MEMORANDUM

TO: Russell Hildebrand, City of Rocklin  
FROM: John P. Long, P.E. and David Tokarski  
DATE: November 10, 2009  
SUBJECT: City of Rocklin LOS Impact Threshold

P/A No. 08141-004

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### Background

The City of Rocklin has requested that DKS Associates review the following level of service impact threshold employed in the Rocklin Commons Draft EIR:

“Based on the City’s significance threshold, if an intersection or roadway segment is already operating at an unsatisfactory level of service, an increase of 5 percent (addition of 0.05) to the v/c ratio would be considered a measurable worsening of the roadway or intersection operations and therefore would constitute a significant project impact.”

This impact threshold is quite common in this region and is currently employed by a number of jurisdictions, including, but not limited to, Sacramento County, and the cities of Sacramento, West Sacramento, Lincoln, Rancho Cordova, Elk Grove, Folsom and Stockton. Those jurisdictions that employ the Circular 212 methodology (which determines level of service based on v/c ratio) utilize 0.05 v/c threshold, while the few jurisdictions that employ the Highway Capacity Manual methodology (which determines level of service based on average intersection delay) utilize a 5.0 second threshold. These jurisdictions have decided to utilize this level of service methodology based on prevailing opinion that 0.05 v/c represents a “measurable worsening” of level of service. For calculations that rely on volume-to-capacity ratio for determination of level of service, 0.05 v/c represents approximately one half of a level of service category and therefore represents a noticeable worsening in perceived congestion, based on the definitions of each level of service category (A-F).

DKS has helped a number of jurisdictions review the standards of significance used in their traffic impact studies. From our experience, we recognize that small increases in measures of traffic congestion (i.e. v/c ratio or delay) can easily result on roadways and intersections that already operate at congested conditions due to the processes used to count and forecast traffic volumes. The selection of 0.05 volume-to-capacity ratio seems reasonable, given the natural fluctuation of many of the inputs to the determination of level of service. Determination of projected level of service relies on a number of inputs, including, but not limited to, existing traffic counts, projected changes in “background” traffic due to local and regional growth,

estimated trip generation of the proposed project, and the potential for re-distribution of travel due to the proposed project.

The factors that affect inputs to the level of service analysis, and thus affect the choice of LOS impact thresholds, are outlined below.

### **Factors Affecting Inputs to LOS Analysis**

In order to determine project impacts, it is first necessary to establish existing conditions on the local roadway network. Existing conditions tend to be based on recent traffic counts conducted on local roadways. Efforts are always made to conduct counts on a “typical day” and the following are taken into account when conducting traffic counts:

- Day of Week (weekday counts typically conducted Tuesday through Thursday);
- School (counts typically conducted during months when local schools and colleges are in session);
- Holidays (counts are typically conducted during weeks when there are no major holidays that would significantly affect traffic);
- Construction (counts are typically conducted when there is no major construction nearby).

Even taking these factors into account, it is quite typical for counts conducted at the same location on different days to vary often by more than five percent. Because intersection turn movement counts are labor intensive, and thus relatively expensive, traffic studies generally rely on a single count, as opposed to averaging a number of counts.

Projected changes in “background” (non-project) traffic due to local and regional growth are based on estimated interaction of vehicle trips generated by numerous projects. These estimates are often calculated by determining trip generation of many projects and subsequently using engineering judgment to determine the interaction of trips generated by these projects. For projections further into the future, a travel demand model may be used. This tool takes into account general land use categories and uses a “four step” model to convert land use and roadway network forecasts into traffic volume forecasts. It should be noted that the travel demand model uses generalized land use categories, such as “retail” and “office” and does not categorize to an especially high level of detail. Therefore, fluctuations of five percent or more are not out of the question when projecting future traffic volumes.

Many traffic engineers and local jurisdictions rely on the Institute of Traffic Engineers (ITE) Trip Generation Manual for estimating proposed project trip generation. The Trip Generation Manual includes many highly detailed categories of land use development. Some of those land use categories rely on a large number of data samples, while others rely on much smaller data samples. It is not unreasonable to assume that trip generation for a proposed project could fluctuate by five percent or more from the published trip generation rate.

Another factor that could result in fluctuations in projected volumes, and therefore level of service, is the potential for re-distribution of travel due to the addition of a new land use in the region. Adding a new retail development could result in residents shifting their travel patterns because a new opportunity opens nearby. Instead of simply adding project trip generation to the “no project” volumes, the travel demand model re-distributes trips based on new living, shopping, and work opportunities.

All of these factors can combine to result in traffic volumes and levels of service that fluctuate based on assumptions included in the analysis. These factors can result in small changes in v/c ratios and/or delay that may not be readily explained by the implementation of the proposed project under study.

### **Conclusion**

For the reasons outlined above, many jurisdictions have determined that use of a threshold that is less than the one used by the City of Rocklin (i.e. less than a 0.5 increase in v/c ratio) is not appropriate for defining a significant impact for locations that are already congested.

Over the last few years, DKS has been the City's traffic consultant performing peer review on traffic impact studies conducted by other consultants and we have provided independent analysis on a range of traffic issues for the City. We believe that the threshold used by the City of Rocklin is reasonable and in line with practices used elsewhere and do not recommend changes in that threshold.