

# Memorandum

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**To:** Kimberly Kerr, Assistant Chief Administrative Officer

**Cc:** Natalie Porter, PE, TE  
Shawna Purvines  
Claudia Wade, PE

**From:** Michael Schmitt, AICP CTP, PTP

**Re:** Technical Memorandum A: Peak Hour Assignment  
El Dorado County Travel Demand Model Update

**Date:** December 17, 2013

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In response to new data provided by SACMET, including the SACMET01 Documentation dated March 8, 2002, and comments provided separately, analysis was undertaken to develop a revised peak hour model for the El Dorado County (EDC) Travel Demand Model (TDM). Specifically, candidate peak hour models were identified for consideration based on their ability to provide additional analysis capabilities that would be useful during future Traffic Impact Mitigation Fee Program analysis.

The purpose of this memorandum is to present the results of validation analysis for three different peak hour models developed for possible use by the EDC TDM. This memorandum provides an overview of the three candidate methods, a review of analysis techniques, and the basis for selecting a preferred EDC TDM Peak Hour Model.

## **I. Candidate Methods**

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Three candidate methods were identified for consideration based on available data, planned uses of the model, and typical approaches by users of SACMET and other TDMs across the US. Following is a brief summary of the selected Peak Hour model methods:

- **Method A.** Apply a functional class based factor representing the percentage of AM and PM Peak Hour, developed from existing count data, to the AM and PM Peak Period assignments to forecast AM and PM Peak Hour assignments (Method A).
- **Method B.** Apply a factor representing the percentage of AM and PM Peak Hour traffic which occurs in the highest hour of each of the two Peak Periods to create AM and PM Peak Hour trip tables. Assign the resulting trips using existing model algorithms.
- **Method C.** Using the information provided on Table 3 of the SACMET01 Documentation prepare AM and PM Peak Hour trip tables. Assign the resulting trips using existing model algorithms.

## **I. Model Validation Methodology**

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At the 290 locations identified for analysis, each of the three EDC TDM Peak Hour method's output was analyzed for a 2010 base year using traffic count data provided by EDC for the a period covering 2009 to 2011. The base year traffic assignment was analyzed for both the AM peak hour and the PM peak hour assignment.

The principle measure of effectiveness (MOE) used to compare each of the three methods was the allowable percent error corresponding to graphs from NCHRP 255<sup>1</sup>, as shown in **Exhibit 1**. This exhibit illustrates the allowable deviation between model volumes and the actual counts for individual roadway links. As shown, the acceptable percent deviation has an inverse relationship with traffic volume (the acceptable percent deviation increases as traffic volumes decrease).

Analysis was carried out for both aggregate results and on an individual link basis. Summary information regarding the number of links that met specified criteria and the total aggregated differences were prepared and subsequently compared. Summary data is provided in **Appendix A**.

## **II. Peak Hour Model Selection**

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The results of the analysis were analyzed both in terms of total error and the number of links which were within NCHRP 255 tolerances. As shown in **Appendix A**, Method B had both the most links within tolerance and the lowest overall error (based on summed total of both AM and PM peak hour assignments). Furthermore, Method B will also facilitate the completion of select link and zone analyses (although Method C will as well, Method A would not directly accommodate this analysis technique). Although Method A is commonly used amongst other SACMET based models it resulted in the greatest level of aggregate error. This is likely the result of the fact that its applicability is intended to span the entirety of the SACOG Region and as such is not necessarily specifically representative of EDC travel behavior (which both Method A and Method B are based only on EDC data). Based on these findings, the results of the analysis, and discussions with EDC staff; Method B was selected for implementation within the current model.

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<sup>1</sup> NCRHP 255: Highway Traffic Data for Urbanized Area Project Planning and Design, National Cooperative Highway Research Program, Washington, D.C., December 1982

**Exhibit 1 – Maximum Desirable Error for Link Volumes**

Source: NCRHP 255<sup>1</sup>







