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**Memorandum**

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Cc: Steve Kooyman, P.E.
            El Dorado County DOT

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Subject: Travel Demand Model Specification and Implementation Tasks

This technical memorandum summarizes the preferred model's specifications and associated implementation tasks. While this memorandum includes many of the activities necessary to update the El Dorado County model; there are additional activities that may be desirable and or necessary to complete an update of the model (i.e., research activities, data collection, coordination with other County departments, etc.). The recommendations provided in this document were developed during the course of previous tasks, through the Traffic Forecasting Workshop conducted on November 29, 2011, as well as with input and direction from El Dorado County Staff.

Model Specification

As of the preparation of this technical memorandum, a final software platform selection has not yet been made. It is anticipated that a final selection will be made during December 2011. Software vendor specifications, including hardware and operating system requirements and detail on software platform features are provided in the Appendix of the draft _Software Platform Matrix_ submitted to the County on November 17, 2011.

GIS Integration

It is recommended that the model network, Traffic Analysis Zones (TAZs), and output be both GIS compatible and accurate GIS representations. The following activities are recommended to be undertaken in support of this recommendation:

- Select a travel demand model that supports GIS integration.
- Determine the extent of the roadway network for the updated model.
- Create the model network and link attributes in GIS using the County's Roadway GIS layer as a base file.

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- Obtain the final GIS version of the 2010 TAZ structure.
- Finalize the GIS version of the 2010 TAZ structure by completing the following:
    - Review locations and size of TAZs to make sure they have reasonable access to the roadway network.
    - Review the number of TAZs to make sure they are appropriate given the overall model design.
    - Confirm County TAZs will conform to census data and SACOG TAZs boundaries.
    - Reducing the number of zones outside of El Dorado County.
- Integrate existing intersection and segment traffic count data into a GIS compatible format.
- Create standardized GIS based templates, which include thematic mapping options and the ability to include existing GIS layers that display landmarks such as political boundaries and waters feature, for presenting model output.

Land Use and Trip Generation Function

It is recommended that the El Dorado County model and updated land use forecast be developed cooperatively through the following activities:

- Develop model functionality to facilitate the conversion of GIS based parcel level land use updates into land use information that can easily be incorporated into the TAZ structure.
- Review the current SACOG SACMET trip generation function for its applicability in developing an El Dorado County specific trip generation function.
- Review the 2008 SACOG model data to determine the extent to which an opportunity to coordinate base year data is reasonable.
- Determine the most appropriate way to represent the 12 identified Traffic Impact Mitigation (TIM) Fee land uses in the land uses identified for model usage.
- Coordination with land use forecast update.

Distribution, Mode Split, and Assignment

- Select a distribution model appropriate to the updated El Dorado County model.
- Develop a method or model appropriate to account for transit trips in El Dorado County.
- Select an appropriate assignment algorithm for the updated El Dorado County model.

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Traffic Data Collection and Model Calibration/Validation

- Review available traffic count data at the onset of the model's development to determine if sufficient data exists to properly calibrate/validate the model. Data should be reviewed both for completeness and reasonableness. Data needs should be documented and then collected.
- Obtain and review data available from SACOG related to trip characteristics and lengths.
- Validate model using Caltrans and FHWA recommended error limits for total error by roadway functional classification.
- Establish the location of major screen lines and validate to within 10% of actual counts.

Software Customization and System Management

- Develop a scenario tool (i.e. scenario manager or catalog) tailored to the needs of the updated El Dorado County model.
- Develop a user plan to document the different levels of user operation desired (i.e. manipulate the entirety of the model, run with a scenario tool only, need output only).
- Establish an electronic file management plan to document scenarios and organize scenario input and output files.
- Determine methods to make select output files available to El Dorado County and/or public GIS users.
- Establish policies regarding the use of forecasts (SACOG, El Dorado County, or Caltrans) on particular roads or roadway types.
- Document differences between the updated El Dorado County model and SACOG model; including model assumptions, input data, and traffic forecasts.
- Identify and develop recommended post-processing techniques including those related to traffic volumes, turn movements, and air quality.

Model User's Manual and Documentation Development

- Prepare a model development document that includes model inputs, assumptions, methodologies, and validation results and techniques.
- Prepare a model user's manual detailing the operational work flow of the model including use of the scenario tool.
- Prepare a document detailing model results for selected future scenarios.

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Staffing Requirements, Training, and Education

- Identify an existing (or hire) transportation professional at the County to maintain and operate the County's model on an ongoing basis.
- Have county staff, that is identified to regularly operate the model, complete vendor provided training (assuming they are not already competent in the software).
- Utilize consultants for training related to local model attributes (not the basic software platform).
- Educate staff, decision makers and the public to improve their understanding of both the appropriate use of macroscopic models and their associated limitations.