APPENDIX I

SACOG SACSIM Travel Model Summary

SACOG uses a regional travel demand model, known as the Sacramento Regional Travel Simulation Model (SACSIM). The 2035 RTP uses transportation data produced by SACOG's SACSIM travel demand model for the 2035 MTP.

The 2035 MTP uses estimates of population, employment and travel patterns for 2005, as the "base year," and future estimates of these same parameters, including transportation system improvements contained in the 2035 MTP, to forecast average weekday travel patterns for a series of future years.

The SACSIM travel demand model produces estimates of daily vehicle miles traveled (VMT), total number of vehicle trips, and total person trips, including public transit ridership.

SACSIM uses land use inputs (socioeconomic data) by parcel for trip generation. These socioeconomic data are expressed in terms of households, employment, and a representative population file, which is consistent with the land use data, and reflects the demographic forecasts adopted by the SACOG Board for use in development of the 2035 MTP.

The SACSIM model consists of four sub-models to account for different types of travel occurring in the Sacramento region:

1. An activity-based tour sub-model, which accounts for all household-generated travel within the region (except airport passenger trips) by creating a one-day activity and trip travel schedule for each person;
2. A commercial vehicle sub-model which accounts for all travel by commercial vehicles, including trips by large trucks;
3. An airport passenger ground-access model, which accounts for travel by air passengers to the Sacramento International Airport; and
4. An external travel sub-model, which accounts for all travel within the region by travelers with origins or destinations outside the region, or travelers through the region.

The travel demand estimates from the four submodels are combined to represent total weekday travel demand in the Sacramento region.

SACSIM also incorporates a mode choice model, which determines how travel destinations are reached by the region's residents and employees.

Existing highway, transit, bike, and walk systems in the Sacramento region are represented in detailed link and node computer networks. Link types include freeway, freeway ramp, expressway, arterial and collector. Future year road and transit networks were developed for the 2035 MTP. The model uses equilibrium, a capacity sensitive assignment methodology. Data

from the model for the emission estimates differentiates between peak and off-peak volumes and speeds. In addition, the model is reasonably sensitive to changes in time and other factors affecting travel choices.

The travel demand model produces estimates of travel demand, traffic volumes, speeds, and transit ridership for the A.M. three-hour peak period, P.M. three-hour peak period, a five hour midday period, and a thirteen-hour late evening / early morning. Daily forecasts are calculated by summing the four time periods.

The SACSIM model was validated in 2007 for the 2005 base year. The model was validated by comparing its estimates of peak, off-peak and daily traffic levels to available peak and off peak traffic counts. The results from model validation / calibration are analyzed for reasonableness and compared to historical trends. Information on the characteristics and constraints of the transportation system and resident's travel survey data were also collected.

The 2007 validation meets standard criteria for replicating total traffic volumes on various road types and for percent error on links. The validation also meets standard criteria for percent error relative to traffic counts. The EPA air quality conformity regulation (93.122 b 3) states that Highway Performance Monitoring System (HPMS) estimates of vehicle miles traveled (VMT) shall be considered the primary measure of VMT within a non-attainment area for the classes of roadways included in HPMS. The regulation also allows locally developed count-based programs.

SACOG uses both HPMS estimates and a database of local traffic counts. HPMS is based on average annual daily traffic. SACOG's models are validated for typical weekday conditions, and many counts exist on non-HPMS segments, which are extremely useful for model validation. HPMS-based estimates of VMT by county are also used as a secondary source in validation of the travel demand model.

The SACSIM model has been extensively tested and validated by SACOG staff. In 2008, the model was the subject of a peer review of independent experts, conducted as part of the Transportation Model Improvement Program. Documentation of the model's function, validation and sensitivity test results, and results of the independent peer review are available from SACOG upon request.