VI

NOISE ELEMENT APPENDIX

NOISE ELEMENT DEFINITIONS*

A-Weighted Level: The sound level in decibels measured on a sound meter using the A-weighting filter network. The A-weighting filter deemphasizes the very low and very high frequency components of sound in a manner similar to the human ear, permitting good correlation with subjective reactions to noise.

Ambient Noise: The composite of noise from all sources near and far. The ambient noise level represents the normal or existing level of environmental noise at a given location.

CNEL: "Community Noise Equivalent Level". The average equivalent A-weighted sound level during a 24 hour day, obtained after adding five decibels to sound levels in the evening (7:00 p.m. - 10:00 p.m.) and ten decibels to sound levels in the night (10:00 p.m. - 7:00 a.m.).

Decibel (dB): A unit for describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals (20 micronewtons per square meter).

Intrusive Noise: Noise which intrudes over and above the existing ambient noise at a given location.

L_{dn}: "Day-Night Average Level". The average equivalent A-weighted sound level during a 24-hour day, obtained after adding ten decibels to sound levels in the night (10:00 p.m. - 7:00 a.m.).

L_{eq}: "Equivalent Energy Level". The sound level corresponding to a steady state sound level containing the same total energy as a time varying signal over a given sample period. L_{eq} is typically computed over one-hour, eight-hour or 24-hour sample periods.

L_{max}: The maximum A-weighted noise level recorded during a noise event.

Noise Contours: Lines drawn on a map indicating equal levels of noise exposure from a given noise source.

* Source: Appendix A, General Plan Guidelines, Governor's Office of Planning and Research, 1990.

Federal Highway Administration (FHWA) Highway Traffic Noise Prediction Model

The Federal Highway Administration (FHWA) Highway Traffic Noise Prediction Model (FHWA-RD-77-108) was used to develop L_{dn} contours for all highways and major roadways in Calaveras County. A more detailed explanation of the model is contained in the **Noise Element Appendix**. The FHWA Model is the analytical method presently favored for traffic noise prediction by most state and local agencies, including Caltrans. The current version of the model is based upon the California and Nevada noise emission factors (CALVENO) for automobiles, medium trucks, and heavy trucks, with consideration given to vehicle volume, speed, roadway configuration, distance to the receiver, and the acoustical characteristics of the site. The FHWA Model predicts hourly L_{eq} values for free-flowing traffic conditions, and is generally considered to be accurate within 1.5 dB. To predict L_{dn} values, it is necessary to determine the hourly distribution of traffic for a typical 24-hour day and to adjust the traffic volume input data to yield an equivalent hourly traffic volume.

Traffic data representing annual average traffic volumes for existing and future conditions were obtained from TJKM Transportation Consultants and Caltrans. These data are summarized in Appendix A. Day/night traffic distribution and truck mix were based upon Caltrans data and Brown-Buntin Associates (BBA) file data. Using these data and the FHWA methodology, traffic noise levels were calculated for existing and future conditions. Distances from the centerlines of the major roadways to the 60 dB L_{dn} contour are summarized in Table 2-1.

These calculations do not include consideration of shielding caused by local buildings or topographical features, so the distances reported in Table 2-1 are worst-case estimates of noise exposure along roadways in the county.

Figure 12, prepared using the FHWA Model, may be used to estimate the distance to the existing 60 dB L_{dn} contour for projected volumes of arterial traffic on the roadways not included in this analysis. For arterial traffic, the predicted distance to the 60 dB L_{dn} contour is determined by the Average Daily Traffic Volume (ADT) and the posted speed limit. L_{dn} contours derived from Figure 12 are only indicators of potential noise conflicts, requiring more detailed analysis to determine traffic noise levels at any given location.

Topography in Calaveras County varies considerably, sometimes alternating from flat to hilly along relatively short roadway segments. Due to the size and topographic complexity of Calaveras County, it was not possible to evaluate the effects of topography on traffic noise at all locations in the county. Therefore the numbers presented in Table 2-1 should be considered estimates of traffic noise exposure, to be supplemented by more detailed study as needed.