The CAL3QHC model produces estimates of 1-hour CO concentrations. These 1-hour concentrations were then converted to 8-hour values using the following formulas.

1-hour CO concentration = Modeled 1-hour value X Altitude Adjustment Factor + 1-hour Background Concentration

8-hour CO concentration = Modeled 1-hour value X Persistence Factor X Altitude Adjustment Factor + 8-hour Background Concentration

For this project, a value of 0.57 was used for the Persistence Factor and a value of 1.13 was used for the Altitude Adjustment Factor (CDOT 2010). Values of 8.9 ppm and 4.6 ppm were used for 1-hour and 8-hour CO background concentrations, respectively (APCD 2010).

PM_{10}

The EPA has not released final guidance for a quantitative analysis of PM10 and therefore, is not required. A qualitative analysis of PM_{10} was performed for this project by evaluating monitor data and the CDPHE 2008 emissions inventory. This project would not result in any meaningful changes to traffic volumes, vehicle mix, or other factors that would cause an increase in emissions impacts compared to the No-Build Alternative.

Mobile Source Air Toxics

Mobile source air toxics (MSATs) are toxic compounds emitted from vehicles. MSATs are a subset of the 188 air toxics defined by the Clean Air Act. The EPA has identified the following seven compounds as MSATs: acrolein, benzene, 1,3-butadiene, diesel particulate matter plus diesel exhaust organic gases, formaldehyde, naphthalene, and polycyclic organic matter (FHWA 2009).

Current modeling tools are not able to estimate emissions of MSATs. Qualitative analysis is difficult to perform due to the lack of air quality monitors measuring these pollutants. Currently, a method to estimate the environmental impacts resulting from the construction or modification of transportation facilities, with regard to MSATs, does not exist.

Even though there is no accepted model or accepted science for determining the impacts of project specific MSATs, as noted above, EPA predicts that its national control programs will result in meaningful future reductions in MSAT emissions, as measured on both a per vehicle mile and total fleet basis.

For each alternative in this Environmental Assessment, the amount of MSAT emitted would be proportional to the vehicle miles traveled, or VMT, assuming that other variables such as fleet mix are the same for each alternative. The VMT estimated for the Build Alternative is slightly higher than that for the No Build Alternative, because the additional capacity increases the efficiency of the roadway and attracts rerouted trips from elsewhere in the transportation network. This increase in VMT would lead to higher MSAT emissions for the preferred action alternative along the highway corridor, along with a corresponding decrease in MSAT emissions along the parallel routes. The emissions increase is offset somewhat by lower MSAT emission rates due to increased speeds; according to EPA's MOBILE6.2 model, emissions of all of the priority MSAT except for diesel particulate matter decrease as speed increases. The extent to which these speed-related emissions decreases will offset VMT-related emissions increases cannot be reliably projected due to the inherent deficiencies of technical models. Because the estimated VMT under each of the Alternatives are nearly the same it is expected there would be no appreciable difference in overall MSAT emissions among the various