

3.13 AIR QUALITY

1. The Draft EIR/EIS used outdated guidance for the calculation of cancer risks.

The Draft EIR/EIS is inadequate because it used an outdated methodology - the Office of Environmental Health Hazard Assessment (OEHHA) Guidance Version 7.0. OEHHA's Air Toxics Hot Spots Program Risk Assessment Guidelines Version 8.0 was approved March 2015. Under the new version of the OEHHA Guidance, cancer risk estimates for residential exposures will increase approximately 3 times (and in some cases as much as 6 times higher). The revised OEHHA Guidelines will affect CEQA documents' construction and operational phases, particularly those with diesel and mobile sources. See South Coast Air quality Management District (SCAQMD), Governing Board Meeting, March 6, 2015, Agenda No. 26, 'Proposed Work Plan for Implementing Office of Environmental Health Hazard Assessment's Revised Air Toxics Hot Spots Program Risk Assessment Guidelines'. All calculations of cancer risk in the Draft EIR/EIS must be revised.

2. Current levels of particulate matter less than 2.5 microns in size have not been identified for the portals.

Table 4-1, Air Quality Levels Measured at the South Wilson Avenue Pasadena Station, and Table 4-2, Air Quality Levels Measured at the North Main Street Los Angeles Station,¹ are incomplete because they do not contain the current federal annual average concentration (12 µg/m³) for particulate matter less than 2.5 microns in size (PM_{2.5}). This information is required in order to understand changes caused to these parameters by the alternatives. The Final EIR/EIS must accurately revise these tables.

3. The air quality analysis does not adhere to generally accepted policies and practices followed by California air quality and health agencies for analysis of Mobile Source Air Toxic (MSAT) impacts on near roadway residential areas.

The Draft EIR/EIS seeks to follow the advice of the Federal Highway Administration instead of agencies with expertise in air quality health impacts, for a determination that "information is incomplete or unavailable to credibly predict the project-specific health impacts due to changes in MSAT emissions associated with a proposed set of highway alternatives²." The California Air Resources Board (CARB), the South Coast Air quality Management District (SCAQMD), the California Office of Environmental Health Hazards Assessment (OEHHA), and other local air districts should have been consulted. These organizations regularly conduct MSAT analyses in their respective jurisdictions and MSAT impact studies for near-roadway scenarios. Failure to consult the appropriate agencies is in violation of CEQA §15086.³

¹ Air Quality Analysis Report, Volume 1, Section 4. Monitored Air Quality, p. 4-2 and 4-3.

² Air Quality Analysis Report, Volume 1, Section 5.4.1, Information that is Unavailable or Incomplete, p. 5-25.

³ CEQA §15086. Consultation Concerning Draft EIR: (a)(6) "For a state lead agency when the EIR is being prepared for a highway or freeway project, the California Air Resources Board as to the air pollution impact of the potential vehicular use of the highway or freeway and if a non-attainment area, the local air quality management district for a determination of conformity with the air quality management plan."

These air quality agencies and other respected researchers have produced significant policy papers and peer reviewed scientific studies detailing the impacts of highway projects, which have received peer praise.⁴ Significantly, these studies tend to agree that freeway adjacent roadside concentrations of ultra-fine particulates, NO_x, black carbon, and carbon monoxide were often ten times higher than those on residential streets. Indeed, in its 2012 Air Quality Management Plan (AQMP), the South Coast AQMD Governing Board adopted a policy committing to conducting such analysis:

However, notwithstanding these court rulings, lead agencies (such as a city or county or air district) that approve CEQA documents retain the authority to include any additional information they deem relevant to assessing and mitigating the environmental impacts of a project. Because of the District's concern about the potential public health impacts of siting sensitive populations within close proximity of freeways, District staff will continue to recommend that, prior to approving the project, lead agencies consider the impacts of air pollutants on people who will live in a new project and provide mitigation where necessary."⁵

The Draft EIR/EIS also errs in failing to follow the long established and approved practice for determining cancer risk in the jurisdiction in which the Project is located. This is in violation of CEQA §15086.⁶ The Draft EIR/EIS statement that "There is also the lack of a national consensus on an acceptable level of risk," does not hold in the State of California, or the South Coast AQMD. In fact, the SQAQMD adopted a risk level of 10 in a million cancer risk for judging new projects almost two decades ago (see e.g. SCAQMD Rule 1401⁷) and has continuously enforced that standard. The SCAQMD and other air quality agencies have been effectively studying the MSAT impact of highway projects for decades and have successfully reduced their impact by half.

The Air Quality and Health analyses should be brought into conformance with accepted air quality analysis policies and practices, and the proper agencies should be consulted. The results should be released in a re-circulation of the Draft EIR/EIS.

4. Quantitative Hot-Spot Analyses have been improperly deferred.

The Draft EIR/EIS is inadequate because it fails to conduct a quantitative PM hot-spot analysis because it relies upon the beneficial impacts of improving particulate matter emissions due to EPA and CARB vehicle regulations. Neither Caltrans nor MTA have authority to approve, modify, or disapprove EPA and CARB vehicle regulations. Moreover, nothing in the project description will cause a change in the impact of EPA's and CARB's vehicle and fuel regulations,

⁴ For example, see SCAQMD's MATES studies, available at <http://www.aqmd.gov/home/library/air-quality-data-studies/health-studies/mates-iv>.

⁵ 2012 Air Quality Management Plan, South Coast Air Quality Management District, February 2013, Chapter 9, page 9-27.

⁶ CEQA §15086. Consultation Concerning Draft EIR: (a)(6) "For a state lead agency when the EIR is being prepared for a highway or freeway project, the California Air Resources Board as to the air pollution impact of the potential vehicular use of the highway or freeway and if a non-attainment area, the local air quality management district for a determination of conformity with the air quality management plan."

⁷ <http://www.aqmd.gov/docs/default-source/rule-book/reg-xiv/rule-1401.pdf?sfvrsn=4>

nor fleet turnover. Therefore, air quality impacts resulting from these regulations are not part of the proposed project and should not be evaluated as part of the Draft EIR/EIS. The PM_{2.5} and PM₁₀ hot-spot form (LSA, May 2014) submitted to and reviewed by the Transportation Conformity Working Group is incorrect because it did not evaluate the PM emission increases attributable to the project. This analysis has been deferred until after the tunnel alternative is selected.⁸

These analyses are required to perform an adequate air quality impact assessment and to convey the impact to the public, stakeholders and decision makers. Their deferral/omission is in violation of both NEPA and CEQA. These analyses need to be performed before a decision is made to build the tunnel alternative, and should be performed and released in a re-circulated Draft EIR/EIS.

5. The quantitative MSAT Analysis improperly takes credit for air quality improvements outside the scope of the project, mischaracterizing the negative health impacts of the freeway tunnel alternative to the public, stakeholders and decision-makers.

In the Draft EIR/EIS, Section 3.13.3.2 Permanent Impacts, pp. 3.13-36 to 3.13-40, the discussion on the Quantitative MSAT Analysis takes credit for air quality improvements resulting from EPA and CARB vehicle regulations. For example, it states

“While the Freeway Tunnel Alternative single-bore design variation would result in a small increase in localized MSAT emissions, the EPA’s vehicle and fuel regulations, coupled with fleet turnover, would cause substantial reductions over time that would cause region-wide MSAT levels to be substantially lower than they are today.”

The same statement is also made for the dual-bore design variation-

Neither Caltrans nor MTA have authority to approve, modify, or disapprove EPA and CARB vehicle regulations. Moreover, nothing in the project description will cause a change in the impact of EPA’s and CARB’s vehicle and fuel regulations, nor fleet turnover. Therefore, air quality impacts resulting from these regulations are not part of the proposed project and should not be evaluated as part of the Draft EIR/EIS. Taking credit for these regulations violates NEPA and CEQA. See *Neighbors for Smart Rail v Exposition Metro Line Const. Auth.* (2013) 57 Cal 4th 439, 445, 457. *Natural Resources Defense Council v U.S. Forest Service* (9th Cir. 2005) 421 F. 3rd 797, 812-813 (EIS relied on erroneous calculations based on improper assumptions, subverting NEPA’s purpose, presenting a “misleading... evaluation of alternatives”). See *Santiago County Water Dist. V County of Orange* (1981) 118 Cal. App. 3rd 818, 829 (EIR must provide accurate information about how “adverse the adverse impact will be.” See, also, 40 CFR Section 1502.24 (Agencies shall insure the professional integrity, including scientific integrity, of the discussion in and analyses in environmental impact statements..”)

⁸ “If the Freeway Tunnel Alternative with either the single-bore or dual-bore design variation is identified as the preferred alternative, a quantitative PM hot-spot analysis will be conducted to demonstrate that the project would not delay attainment of or worsen existing violation of or cause an exceedance of the PM_{2.5} or PM₁₀ national ambient air quality standards and meets conformity requirements.” (Air Quality Analysis Vol I, Executive Summary, page iii).

The misleading characterization of air quality impact ‘improvements’ for the tunnel alternative continued at the Draft EIR/EIS public hearings. At these hearings, Metro presented a power point presentation that stated, “Decrease of cancer risk in the study area for all alternatives compared to existing conditions.”⁹ The presentation failed to mention that the tunnels would increase the cancer risk burden by up to 149 in a million for the Maximum Exposed Individual Resident (MEIR) and 170 in a million for the Point of Maximum Impact (PMI)¹⁰. This omission represents a gross and repeated misrepresentation of health environmental impacts to the public, stakeholders and decision-makers and compromises the integrity of the EIR/EIS process.

6. By failing to properly present the cancer risk *attributable to the project*, the Draft EIR/EIS fails to discuss important negative health impacts to residents near the roadway (both below the South Portal and above the North Portal)

The Draft EIR/EIS claims that cancer risk near the roadway and throughout the region will actually decrease.¹¹ However, this claim is inaccurate and misleading because the analysis must separate-out the effects of ongoing changes not within the Project description, *i.e.* the beneficial cancer risk impact from the EPA and CARB regulations on trucks. The correct analysis should compare the “No Build” condition, separating-out the beneficial cancer risk impact from the EPA and CARB regulations, to all of the “Build” alternatives, also separating- out the beneficial cancer risk impact from the EPA and CARB regulations. This analysis would show the difference, which is the true cancer risk increase due to the Project alone. This is in contrast to the guidance provided in Caltrans’ own Model EIR/EIS. According to the Model EIR/EIS, Caltrans states that the EIR/EIS should “[d]iscuss the impacts of each build alternative and the no-build alternative.”¹² The impact can be seen to be very significant both below the South Portal and above the North Portal.¹³

Furthermore the Draft EIR/EIS clearly seeks to focus on the larger study area ignoring the more important direct impacts near the roadway. The significant direct cancer risk impact of the Project will fall upon residents near the roadway (both below the South Portal and above the North Portal); this important impact cannot be seen by analyzing regional averages, as the EIR/EIS seeks to do. In its 2012 Air Quality Management Plan (AQMP), the SCAQMD Governing Board adopted a policy committing to conducting such analysis:

However, notwithstanding these court rulings, lead agencies (such as a city or county or air district) that approve CEQA documents retain the authority to include any additional

⁹ ‘State Route 710 North Draft EIR/EIS, Hearing Presentation’, Metro PowerPoint slides, April 11 and 14, 2015; may 6 and 7, 2015, p. 35.

¹⁰ Draft EIR/EIS, Health Risk Assessment, Volume 1, pg. ES-4. Also see Health Risk Assessment Volume 1, Table 3-4.

¹¹ “The six variations of the Freeway Tunnel Alternative showed similar cancer risk impact and benefit trends within the study area, as shown in Figures 3-14 through 3-19. Cancer risks in the majority of the study area would slightly decrease by less than 10 in 1 million from the no build condition.” (Health Risk Assessment Analysis Vol. I, page 3-8).

¹² Model EIR/EIS, p. 2.

¹³ See Figures 3-14 through 3-19 in the Health Risk Assessment Analysis Vol I.

information they deem relevant to assessing and mitigating the environmental impacts of a project. Because of the District's concern about the potential public health impacts of siting sensitive populations within close proximity of freeways, District staff will continue to recommend that, prior to approving the project, lead agencies consider the impacts of air pollutants on people who will live in a new project and provide mitigation where necessary.¹⁴

The Health Risk Assessment Volume 1 Technical Report does contain some information showing the true potential cancer risk, but the information is buried deep within the report and is not expressly analyzed. For example, in comparing Figure 3-14 (Incremental Cancer Risk Freeway Tunnel Alternative - Single Bore w/ Express Bus (T1_V1) with the No Build Alternative (2025), one sees an increase of cancer risk between 10 and 100 in a million on either side of the roadway to the tunnel for between 5 to 10 kilometers below the South Portal and over 10 kilometers above the North Portal. The increased cancer risk extends in width for 1 to 2 kilometers on either side of the roadway below the South Portal. The increased cancer risk extends in width for 2 to 3 kilometers on either side of the roadway above the North Portal. The standard used for new project cancer risk significance by South Coast AQMD is 10 in a million. In addition, in comparing Figure 3-18 (Incremental Cancer Risk Freeway Tunnel Alternative - Dual Bore w/o Toll (T2_V4) with the No Build Alternative (2025), one sees an increase of cancer risk between 10 and 100 in a million on either side of the roadway to the tunnel for over 20 kilometers below the South Portal and over 20 kilometers above the North Portal. The increased cancer risk extends in width for 2 to 3 kilometers on either side of the roadway below the South Portal. The increased cancer risk extends in width for 2 to 5 kilometers on either side of the roadway above the North Portal. There are even residential areas above the North Portal that will have an increase of greater than 100 in a million. The standard used for new project cancer risk significance by South Coast AQMD is 10 in a million.

7. MSAT analysis for the tunnel alternative indicates that increases in cancer risk far exceeds both the South Coast AQMD and EPA standards.

The Health Risk Assessment, Volume 1, Table 3-4 shows the incremental cancer risk for the tunnel alternative as being 149 in a million for the Maximum Exposed Individual Resident (MEIR) and 170 in a million for the Point of Maximum Impact (PMI). The South Coast AQMD adopted a risk level of 10 in a million cancer risk for judging new projects almost two decades ago (see e.g. SCAQMD Rule 1401¹⁵), and has continuously enforced that standard. The EPA national standard is 100 in a million. Consequently, the tunnel alternative exceeds the AQMD and EPA standards by approximately 17 times and 1.7 times respectively.

8. The Draft EIR/EIS selected the wrong year for the Health Risk Assessment.

The Draft EIR/EIS Health Risk Assessment argues that the earliest year (2020 or 2025) will have higher MSAT emissions, because the Assessment tries to incorrectly take credit for benefits from regulatory requirements issued and enforced by other agencies (EPA's and CARB's vehicle and

¹⁴ 2012 AQMP Chapter 9, page 9-27.

¹⁵ <http://www.aqmd.gov/docs/default-source/rule-book/reg-xiv/rule-1401.pdf?sfvrsn=4>

fuel regulations), and therefore outside of the project description.¹⁶ But this violates the definition of the 'Project'.¹⁷ Neither MTA nor Caltrans have authority to approve, modify, or disapprove EPA and CARB vehicle regulations. EPA and CARB vehicle regulations will cause the MSAT emissions to decrease going forward, but these regulations are not a part of this project, and neither MTA nor Caltrans have authority over these regulations. The Draft EIR/EIS instead shows that there will be an increase in MSAT emissions going forward, *attributable to this project*. This also violates CEQA Guidelines Amendments as amended October 23, 2009.¹⁸

The Draft EIR/DEIS Health Risk Assessment selected the incorrect year for analysis because the MSAT emissions attributable to the Project (primarily from increased truck traffic) will increase over time. The Health Risk Assessment states "Because the vehicle MSAT emissions would decrease in future years, the HRA under Scenario 2 used the worst-case emissions during project operation—emissions from the project opening year (2020 or 2025)." This caused the analysis to select the year with the lower emissions from traffic (2020 or 2025) *attributable to the project*, instead of the forecast year (2035), which will have higher emissions *attributable to the project*. The reason why the Assessment incorrectly assumes the MSAT emissions will be less in later years is its inclusion of the benefits from EPA's (and CARB's) vehicle and fuel regulations. The impact of EPA's (and CARB's) vehicle and fuel regulations and normal fleet turnover are not results of the project itself, and cannot be used to count as benefits of the project. Therefore, the Draft EIR/EIS is inadequate in this regard; the Final EIR/EIS must address and properly analyze these issues.

9. Important information regarding the tunnel air pollution control system is not provided; consequently, the adequacy of the design cannot be validated.

The Draft EIR/EIS Air Quality Analysis fails to adequately specify important air quality mitigation techniques. The description of the particle pollution removal method is sometimes conflicting and otherwise completely lacking in detail. Sometimes it is referred to as "scrubbers"¹⁹ and other times as "filtration." This key distinction strongly affects removal efficiency and maintenance. It is also likely to be a large contributor to both initial and operating costs.

The Draft EIR/EIS also fails to provide technical information necessary for the reviewer to evaluate the adequacy of the proposed mitigation. For example, the Air Quality Analysis, Vol. I,

¹⁶ See 3.2 Scenario 2: Build Alternatives vs. No Build Alternative (Opening Year), p. 3-7.

¹⁷ Chapter 13 Section 15378. "PROJECT. (c) The term "project" refers to the activity which is being approved and which may be subject to several discretionary approvals by governmental agencies."

¹⁸ § 15126.2. Consideration and Discussion of Significant Environmental Impacts. "(a) The Significant Environmental Effects of the Proposed Project. An EIR shall identify and focus on the significant environmental effects of the proposed project. In assessing the impact of a proposed project on the environment, the lead agency should normally limit its examination to changes in the existing physical conditions in the affected area." See also § 15125. Environmental Setting. "(a) An EIR must include a description of the physical environmental conditions in the vicinity of the project, as they exist at the time the notice of preparation is published, or if no notice of preparation is published, at the time environmental analysis is commenced, from both a local and regional perspective. This environmental setting will normally constitute the baseline physical conditions by which a lead agency determines whether an impact is significant. The description of the environmental setting shall be no longer than is necessary to an understanding of the significant effects of the proposed project and its alternatives."

¹⁹ See Draft EIR/EIS Health Risk Assessment, p. 1-21 and pp. 2-70, 3.1-38, 3.1-58 (Table 3.1.3).

p. 5-14, states that a particulate matter control efficiency of 80% was assumed based on a consultant report, (ILF Consulting Engineers, 2013); however, the report is not listed in the references section and is not generally available. This critical assumption about filter efficiency requires more detail for validation.

Other important questions are also left unanswered. For example, what will be the expected pressure drop at start up and how much will it go up as the filters become loaded? Will the increases in pressure drop reduce flow rates out of the stacks and result in more non-filtered air coming out of the tunnel openings? How often will filters need to be changed? How will filter performance be monitored?

In addition, the feasibility of filtering the very long SR-710 tunnels was not adequately discussed. Most long tunnels are not filtered. Those that are filtered do so primarily for visibility reasons, and use electrostatic precipitators (ESPs) with multiple bypass flow locations²⁰. ESPs consume large amounts of power and become less efficient as particle size decreases. They are not efficient with ultrafine particles.

In summary, the Draft EIR/EIS fails to provide the technical information required to validate the tunnel air quality control systems. This does not comply with CEQA 15147.²¹ This information should be revised and re-circulated in a new Draft EIR/EIS, so that the design can be understood by the public, stakeholders and decision makers before irrevocable decisions are made.

10. The dispersion model for the tunnel exhaust tower(s) cannot be validated due to a lack of information on the facility.

The Draft EIR/EIS fails to provide adequate information for the reviewer to understand the effectiveness of the mitigation measure for tunnel exhaust, and the small amount of information that is provided is unsubstantiated.²² Compared to the thousands of rows of traffic data and emissions rates listed in Appendices A-1 through A-11, only four rows (a fraction of a page) are devoted to the tunnel stack conditions in Appendix B-2. These four rows only list the stack location, height, exhaust temperature, exit velocity and diameter. The origin of these critical numbers is not provided. How these numbers change depending on the emissions control technology used (e.g., exhaust temperature) and the control efficiency of particulate matter is not listed in Appendix B-2, or anywhere in the Draft EIR/EIS report.

Moreover, it is unclear whether the facility location and design has been properly modeled for the north portal towers. The Draft EIR/EIS has 'deferred' the location and design of these towers. At least 3 different locations have been suggested in both the Draft EIR/EIS and in the Public Hearings. One, two and six 'towers' are being considered with varying heights. The dispersion model says these towers were modeled as 'point sources'²³.

²⁰ 'The Treatment of Air in Road Tunnels', Tunnel Studies Centre, 25 avenue Francois Mitterrand, Bron, France), 2010.

²¹ CEQA 15147, TECHNICAL DETAIL: "The information contained in an EIR shall include summarized technical data, maps, plot plans, diagrams, and similar relevant information sufficient to permit full assessment of significant environmental impacts by reviewing agencies and members of the public."

²² See SR 710 Health Risk Assessment, Vol. II, Appendices A-1 through A-11 & Appendix B-2.

²³ Air Quality Analysis, Volume 1, p. 5-12.

Clearly a meaningful air dispersion analysis cannot be performed until the location of the exhaust facility and its other key design parameters are established. Only then can other variables such as traffic flow, weather conditions, etc. be considered. Failure to provide adequate technical information is in violation of CEQA 15147²⁴ and 15126.4.²⁵ Proper modeling of air dispersion at the tunnel exits is very important since the portals are in very close proximity to numerous schools and health care facilities. See Attachment 1.

11. The dispersion models near the portals do not consider unfiltered air escaping from the tunnel exit with the traffic.

A key source of emissions in the portal areas is the tunnel exits. Air at these exits will not be controlled by the proposed air pollution control system (using scrubber or filtration as yet undefined) and it is possible that the tunnel exits will become point sources of concentrated vehicle exhaust. A detailed analysis of air flow, pressures along the length of the tunnel, pressure drops due to filtering, and pressure disturbances due to moving vehicles is needed to evaluate how much unfiltered air is likely to exit the tunnels and its environmental impact.

Proper modeling of air dispersion at the tunnel exits is very important since the portals are in very close proximity to numerous schools and health care facilities. See Attachment 1.

12. Dispersion model parameters were inadequately described and a sensitivity analysis was not performed.

Merely citing that dispersion model parameters inputs were selected in accordance with a guidance document does not provide adequate information to evaluate the range of possible inputs, possible uncertainty in the inputs, and any important simplifying assumptions. For example, the Air Quality Analysis, Vol. I, p. 5-12 states:

“For volume sources, initial horizontal and vertical dimensions (σ_y0 and σ_z0 , respectively) were based on Table 3.1 in the User’s Guide for the AMS/EPA Regulatory Model-AERMOD EPA-454/B-03-001, September 2004.”

This language is also used in the Draft EIR/EIS, Volume 1 on p. 3.13-21.

These are important inputs and their selection should be put in context of what they represent physically and to what extent they constitute a reasonably conservative way to simulate a widely varying set of conditions. This applies to the other variables listed in the Air Quality Analysis, Vol. I, pp. 5-12 through 5-14.

²⁴ CEQA 15147, TECHNICAL DETAIL: “The information contained in an EIR shall include summarized technical data, maps, plot plans, diagrams, and similar relevant information sufficient to permit full assessment of significant environmental impacts by reviewing agencies and members of the public.”

²⁵ CEQA 15126.4, CONSIDERATION AND DISCUSSION OF MITIGATION MEASURES PROPOSED TO MINIMIZE SIGNIFICANT EFFECTS, (a)(1)(B), “...Formulation of mitigation measures should not be deferred until some future time.”

Good modeling practice typically includes a sensitivity analysis of the model inputs, conducted by varying the input parameters individually within the range of their uncertainties (or the estimated uncertainty of the expert judgment) to see how much the outputs vary. This also allows the determination of which variables or assumptions deserve special attention. A sensitivity analysis can also be used to evaluate overall uncertainty of the results (see below). Failure to perform this analysis is a deficiency of the Draft EIR/EIS.²⁶

13. Criteria for establishing receptor locations was not established and the location of the receptors could not be resolved with information provided; consequently, receptor air quality environmental impacts could not be validated.

It was not clear how air quality receptor locations were chosen, if they cover all of the nearest residents, or how well they cover sensitive receptors such as Huntington Hospital. For example, Huntington Hospital includes multi-story buildings with air intakes that might be elevated and thus impacted more directly from a tall exhaust stack. Enlarged and more detailed maps of the receptors locations around the portals are necessary to judge receptor location adequacy.

Maps of receptor locations should be of sufficient resolution to allow evaluation of the near source impacts from the tunnel exhaust stacks and include labeled locations of vulnerable receptors. Figure 2-1 at p. 2-9 of the Health Risk Assessment appears to be the only map of receptor locations in the report and does not provide adequate resolution to evaluate the tunnel exhaust stack receptor locations. However, this figure does indicate that the receptors near the tunnel exhausts may be too sparse to capture the locations of the maximum concentrations of sharp gradients. There may also be variations in plume touchdown location that will occur from an elevated stack under different meteorological conditions. These characteristics call for a very dense receptor grid around the tunnel exhaust stacks.

Appendix B-3 provides approximately 7 pages of sensitive receptors, primarily schools, but the locations are only given in coordinates. No information is given about their direction and distance from the stacks. These receptors should be plotted on a map. Failure to provide adequate technical information is in violation of CEQA 15147.

14. The dispersion model does not appear to adequately cover the reduced dilution that occurs at night.

Special consideration of calm (< 1 m/s) reverse sea-breeze nighttime winds is necessary to ensure that nighttime emissions do not result in significant increases in exposure and cancer risk. These reverse flows generally come from the northeast and are probably not properly modeled using AERMOD. For example, recent measurements show that dispersion impacts from

²⁶ See, e.g., GUIDELINES FOR IMPLEMENTATION OF THE CALIFORNIA ENVIRONMENTAL QUALITY ACT, Article 10. Considerations in Preparing EIRs and Negative Declarations: "15147. TECHNICAL DETAIL The information contained in an EIR shall include summarized technical data, maps, plot plans, diagrams, and similar relevant information sufficient to permit full assessment of significant environmental impacts by reviewing agencies and members of the public."

freeways in Los Angeles are ten times longer at night than during the daytime.²⁷ Failure to provide adequate technical information is in violation of CEQA 15147.

15. The Draft EIR/EIS fails to acknowledge the uncertainty of estimated emission rates and modeling results, and the values shown imply precision that does not exist.

The precision of the results should reflect the uncertainty in the modeling, which can easily exceed 100%, depending on the averaging time chosen and the comparisons made. Two well-cited examples from the scientific literature dealing with dispersion model uncertainty are given below:

‘A statistical approach for estimating uncertainty in dispersion modeling: An example of application in southwestern USAm’ D. Koracin et al. / Atmospheric Environment 41 (2007) 617–628,

‘Analysis of air quality data near roadways using a dispersion model’, A. Venkatram et al. Atmospheric Environment 41 (2007) 9481–9497.

Both of these studies used the percent of time that different models agreed within a factor of two, (i.e., a 100% difference) as the performance metric.

Any examination of these papers or other scientific literature on vehicle emission factors and/or dispersion modeling uncertainty shows that neither is ever considered accurate to within a few percent. However, this is what is implied in the presentation of results in the Draft EIR/EIS. To cite an important but typical example from the Draft EIR/EIS in the Air Quality Analysis, Volume 1, Table 5.8, p. 5-17, the single-bore tunnel with toll is predicted to result in a maximum 24-hour PM_{2.5} concentration of 5.137 ug/m³ with an accuracy of +/- 0.001 (0.02%) - if the thousandth of a microgram precision is believed. This result is 0.143 ug/m³ lower than the predicted No Build PM_{2.5} concentration, a decrease of less than 3%. Properly taking uncertainty into account means that this alternative and the others are not distinguishable in their impacts based on the dispersion model methodology used. It should also be acknowledged that the air quality impacts of any particular alternative might be a factor of two higher or lower than modeled.

A more honest assessment of uncertainty is given later in Section 5.4.1, p. 5-25, regarding mobile source air toxics:

“The outcome of such an assessment, adverse or not, would be influenced more by the uncertainty introduced into the process through assumption and speculation rather than any genuine insight into the actual health impacts directly attributable to MSAT exposure associated with a proposed action”.

Unfortunately, this observation, while it applies to all the modeling conducted, is attributed only to the specific views of the Federal Highway Administration regarding mobile source air toxics.

²⁷ See Hu et al., 2009; Choi et al., AE 2012, both Atmospheric Environment.

Future SR-710 Study discussions and analyses should clearly identify model uncertainties and remove indications of excess precision.

16. Dispersion model inputs for emission rates are unwieldy and impossible to evaluate as presented.

Hundreds of pages of traffic volume data and emission rates are presented in tabular form in the Health Risk Assessment, Vol. II, Appendices A-1 through A-14. For example, the first page of Appendix A-1 lists over 2000 numbers. Evaluating trends, differences, reasonableness or accuracy of emission rate assumption or model inputs is not possible from dense tables of stand-alone numbers.

Furthermore, there is little or no explanation of how any of these numbers were derived. Mobile source emission rates vary widely by speed, acceleration, engine temperature, engine load (was tunnel grade taken into account?), vehicle year, vehicle size and weight, etc. These assumptions need careful description and justification in the appendices if dispersion modelers are to evaluate, test, and/or duplicate the results. Furthermore, a summary of the process used to derive the numbers is needed in the Draft EIR/EIS Volume 1.

17. Concentrations of air pollution inside the tunnel are not discussed and may produce high health risk for regular tunnel users, or for drivers that are delayed in the tunnel due to congestion or accidents.

The Draft EIR/EIS fails to discuss the health impacts within the tunnel in the very likely scenario of heavy traffic congestion. Concentrations in the tunnel may be harmful to health, particularly if congestion causes slow speeds in the tunnel. A recent paper by Hans Orru et al., *Journal of Exposure Science and Environmental Epidemiology*, estimated that for a proposed tunnel near Stockholm, the reductions in premature mortality from reduced air pollution in Stockholm due to traffic diverted around Stockholm (24 deaths per year) is largely offset by expected increases in premature mortality due to high exposures for tunnel users (21 deaths per year)²⁸. Failure to provide adequate technical information is in violation of CEQA 15147.

18. The Draft EIR/EIS failed to include a Health Impact Assessment.

The SR-710 Freeway Tunnel Alternative will have a significant impact on health for residents of the San Gabriel Valley, for those living along the 710 and 210 Corridors, and especially for those who work and live near the tunnel portals. Consequently, a Health Impact Assessment needs to be performed to adequately assess the effects on the health of the population and the distribution of those effects within the population. This assessment needs to be performed immediately and before the final alternative is selected so that the public, stakeholders and decision-makers are informed on the impacts of the project.

²⁸ 'Potential health impacts of changes in air pollution exposure associated with moving traffic into a road tunnel', Hans Orru, *Journal of Exposure Science and Environmental Epidemiology*, doi: 10.1038/jes.2015.24, April 29, 2015.

Figure A
 Sensitive Receptors Near the Tunnel North Portal

