ATTACHMENT B

to

City of Alhambra Comment Letter 8-5-15

State Route 710 (SR 710) Draft Environmental Impact Report and Draft Environmental Impact Statement (DEIR/EIS) Air Quality and Health Risks Impacts Review prepared by Ramboll Environ

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Dr. Julia Lester has over 21 years of experience in environmental services. She joined ENVIRON in August 2004, after over 14 years at the South Coast Air Quality Management District (SCAQMD). She has substantial expertise in air quality planning and analysis, including emission inventory assessment, air quality modeling, health risk analysis and control strategy development, assessment and implementation. Her experience has given her a broad understanding of air regulatory issues for ports; transportation goods movement project proponents; sanitation and wastewater utilities; biomass conversion and waste-to-energy facilities; crop and animal agriculture; fugitive dust planning agencies; and agencies/industries with specialized air regulatory challenges. She has provided permitting and compliance assistance to numerous facilities subject to air agency regulations, including Title V facilities. She is a SCAQMD-certified permitting professional and a San Joaquin Valley Air Pollution Control District-certified air permitting professional. Julia has conducted regulatory negotiations with many air agencies, and has supported clients in litigation, before city councils and in other public forums. She has a PhD and an MS in chemical engineering from the California Institute of Technology, and a BS in chemical engineering from Purdue University.

Send

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MEMO

Date	**July 10, 2015**
To	**Leland Dolley**
From	**Julia Lester, Ramboll Environ**
Subject	**State Route 710 (SR710) Draft Environmental Impact Report and Draft Environmental Impact Statement (DEIR/DEIS) Air Quality and Health Risk Impacts Review**

Per your request, Ramboll Environ has reviewed the Air Quality and Health Risk sections of the SR710 DEIR/DEIS.[1] Ramboll Environ's key comments are included below in this cover Memorandum.

Only the Dual-Bore Freeway Tunnel Alternatives, compared to the other alternatives or doing nothing, will enhance expected future air quality and health risk benefits to the traditionally impacted cities in the southern part the SR710 Gap (Alhambra, El Sereno, and Monterey Park). Areas north of the SR710 Gap, which have lower current cancer risk from air pollution, will have lower future cancer risk even with the Dual-Bore Tunnel Alternative. The Dual-Bore Freeway Tunnel Alternative also reduces emission-related travel miles on the SR2, I5, and SR110 and on local arterials in Pasadena, South Pasadena, Alhambra, and other communities in the San Gabriel Valley. Other alternatives, particularly the Bus Rapid Transit and Light-Rail Transit Alternatives (BRT and LRT Alternatives, respectively), generally have no effect or retard air quality and health risk improvements in the heavily-impacted greater Alhambra / San Gabriel area. In addition, only the Tolled, Dual-bore Freeway Tunnel Alternative is in the adopted 2012 Regional Transportation Plan / Sustainable Communities Strategies (2012 RTP/SCS) and thus, meets regional transportation air quality conformity requirements.

Date July 10, 2015

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[1] http://www.dot.ca.gov/dist07/resources/envdocs/docs/710study/draft_eir-eis/

KEY COMMENTS

A. ***The Air Quality and Health Risk Assessment meets or exceeds Caltrans standard environmental requirements and the current state-of-the-practice for large-scale transportation projects.***

Ramboll Environ reviewed several DEIR/DEIS, with a more detailed review of the following DEIR/DEIS documents:

- DEIR/DEIS Volume 1, Section 3.2
- Air Quality Assessment Report (January 2015)[2,3]
- Health Risk Assessment (November 2014)[4,5]

Chapter 11 of the Caltrans Standard Environmental Reference (SER)[6] describes "the regulatory framework and recommended procedures for performing an air quality analysis for both Caltrans and local agency transportation projects."[7] The DEIR/DEIS includes the standard assessments required the SER, consistent with the recommended procedures. In addition, the DEIR/DEIS includes a Health Risk Assessment that goes beyond the SER requirements. The analyses in the Health Risk Assessment is consistent with the current state-of-the-practice for large-scale transportation projects, such as terminal projects at the San Pedro Bay ports and the I710 Corridor Project. As noted in the DEIR/DEIS (page 3.13-14), only the Tolled, Dual-bore Freeway Tunnel Alternative is in the adopted 2012 Regional Transportation Plan / Sustainable Communities Strategies (2012 RTP/SCS) and thus, meets regional transportation air quality conformity requirements.

B. ***The FEIR should emphasize the long-standing and current health risk disparity (greater risk in Alhambra and nearby communities compared to areas to the north of the SR710 gap, where risk levels are 20 to 50% lower) exists, in part, because of the SR710 gap and that only a Tunnel alternative further reduces (although it does not eliminate) that disparity while risks in areas around and north of the SR710 Gap still decrease in the future.***

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[2] SR710 DEIR/DEIS. Air Quality Assessment Report. Volume 1. January 2015. http://www.dot.ca.gov/dist07/resources/envdocs/docs/710study/draft_eir-eis/Air%20Quality%20Analysis/SR%20710%20Air%20Quality%20Analysis%20Vol%20I.pdf

[3] SR710 DEIR/DEIS. Air Quality Assessment Report. Volume 2. January 2015. http://www.dot.ca.gov/dist07/resources/envdocs/docs/710study/draft_eir-eis/Air%20Quality%20Analysis/SR%20710%20Air%20Quality%20Analysis%20Vol%202.pdf

[4] SR710 DEIR/DEIS. Health Risk Assessment. Volume 1. November 2014. http://www.dot.ca.gov/dist07/resources/envdocs/docs/710study/draft_eir-eis/Health%20Risk%20Assessment/SR%20710%20Health%20Risk%20Assessment%20Vol%20I.pdf

[5] SR710 DEIR/DEIS Health Risk Assessment. Volume 1. November 2014. http://www.dot.ca.gov/dist07/resources/envdocs/docs/710study/draft_eir-eis/Health%20Risk%20Assessment/SR%20710%20Health%20Risk%20Assessment%20Vol%202.pdf

[6] http://www.dot.ca.gov/ser/vol1/sec3/physical/ch11air/chap11.htm

[7] Ibid

The Final EIR/EIS should describe:

- The higher cancer risk now in the southern end of the SR710 Gap compared to areas north of the SR710 Gap
- Fleet turnover for cars and trucks will reduce cancer risk for **ALL** alternatives and **ALL** areas in the Study Area, including the Tunnel Alternative for the northern cities (e.g., Pasadena, La Canada/Flintridge
- That only Tunnel alternatives reduce the relative risk differential due, in part, to the SR710 Gap and that the Transportation System Management / Transporation Demand Management (TSM/TDM), bus (BRT), and light rail (LRT) alternatives do not address this higher relative risk at all
- The latest Office of the Environmental Health Hazard Assessment (OEHHA) exacerbates the risk differential, accentuating the need for the Tunnel Alternative to reduce that decades-old risk differential

South SR710 Gap communities have the greatest existing cancer risk: The Multiple Air Toxics Exposure Study (MATES) IV recently completed by the South Coast Air Quality Management District (AQMD) has shown that cities near the southern SR710 stub (Alhambra, El Sereno, Monterey Park and East Los Angeles) have greater levels of air pollution cancer risk compared to other Study Area cities.[8] The following table shows that the southern SR710 stub cities have 2012 cancer risks that range from 50 to 290 in a million greater than the cities in and north of the gap.

Locations in Study Area	Cancer Risk (in a Million)	Compared to Alhambra	% Difference
La Canada/Flintridge	280	-280	-50%
Pasadena (Northern Termini)	460	-100	-18%
South Pasadena	380	-180	-32%
Alhambra (Southern Termini / Valley)	***560***	0	0%
El Sereno	***510***	-50	-9%
Monterey Park	***520***	-40	-7%
East LA	**570**	10	2%

Note: Figure 1 of this Memorandum is the MATES IV interactive map and 2012/2013 cancer risk values for selected locations in the general Study Area.

[8] Values taken from the MATES IV interactive map at http://www3.aqmd.gov/webappl/OI.Web/OI.aspx?jurisdictionID=AQMD.gov&shareID=73f55d6b-82cc-4c41-b779-4c48c9a8b15b

All Cities in the Study Area will have lower air pollution levels and air-related cancer risk in 2020 and beyond: The DEIR Air Quality Assessment Report (AQAR) shows that criteria pollutant emissions will decrease from the 2012 base year to 2020 and 2025 (AQAR Table 5-11). Based on Figures 3-1 through 3-10 in the SR710 DEIR Health Risk Assessment (HRA) Report, cancer risk in all cities in the Study Area will decrease 50 to 350 in a million, with the greatest decreases along freeways with the most truck traffic (i.e., I5 from the I10 to SR2; I210 from the I605 through Pasadena to SR2; I10; and I605). Even in the worst case (dual-bore tunnel with toll and trucks), cancer risk is reduced from current 2012 levels everywhere in the Study Area (HRA Figure 3-8). Even by the North Portal in Pasadena, cancer risk is 10 to over 300 in a million lower than current levels even with the dual-bore tunnel with toll and trucks alternative (see Figure 2 of this Memorandum).

Only the Freeway Tunnel provides large-scale decreases in cancer risk in heavily impacted cities when compared to the No-Build, BRT and LRT alternatives: Based on Figures 3-11 through 3-19 of the Health Risk Assessment, the Freeway Tunnel alternatives significantly reduce cancer risk (e.g., more than 10 in a million and in places more than 50 in a million) in the greater Alhambra / El Sereno / San Gabriel area compared to doing nothing or implementing the BRT or LRT alternatives (see Figure 3 of this Memorandum).[9] Note that even with a Tunnel alternative that there will still be higher risk levels in communities south of the SR710 compared to those north of the SR710 (current 2012 disparity: 100 to 280 in a million; greatest benefit (dual-bored tunnel alternative) in greater Alhambra / San Gabriel area compared to No-Build: ~50 in a million).

The relative risk in the greater Alhambra areas is even greater if the latest OEHHA health risk method is used: In May 2015, OEHHA adopted a revised methodology to calculate health risks (and in particular cancer risk).[10] As a rule of thumb, cancer risk due to airborne gaseous toxics and diesel particulate matter (DPM) will be estimated to be about 2.7 times greater than previous estimates.[11] The actual risk has not changed, but the estimates will be greater because the new method accounts for the enhanced effects during the 3rd trimester of pregnancy and young children from ages 0 to 2 years old.

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[9] http://www.dot.ca.gov/dist07/resources/envdocs/docs/710study/draft_eir-eis/Health%20Risk%20Assessment/SR%20710%20Health%20Risk%20Assessment%20Vol%20I.pdf

[10] http://oehha.ca.gov/air/hot_spots/hotspots2015.html

[11] Increased cancer risk estimate projections of 2.4 to 3 times have been cited in air agency presentations and reports. 2.7 was chosen as a mid-range estimate. More information on SCAQMD's incorporation of the 2015 OEHHA methodology can be found at http://www.aqmd.gov/docs/default-source/Agendas/Governing-Board/2015/2015-jun1-028.pdf?sfvrsn=9

Locations in Study Area	Estimated Cancer Risk based on new OEHHA method (in a Million)	Compared to Alhambra
La Canada/Flintridge	756	-756
Pasadena (Northern Termini)	1242	-270
South Pasadena	1026	-486
Alhambra (Southern Termini / Valley)	1512	0
El Sereno	1377	-135
Monterey Park	1404	-108
East LA	1539	27

C. ***The FEIR should note that only a Tunnel alternative reduces criteria and air toxic emissions on historically impacted arterials, including those in the greater Alhambra/San Gabriel communities, by reducing arterial vehicle miles travelled (VMT) by trucks and cars, and improving mobility (i.e., less stop-and-go traffic).***

The Freeway Tunnel offers more local air quality benefits (compared to the No-Build) than the BRT and LRT alternatives: Vehicles travel on freeways and local roadways. Air emissions and related impacts are generally a function of the vehicle miles travelled (VMT), with adjustments for vehicle speed, etc. Based on the average daily trip (ADT) information for freeways and local arterials in the SR710 DEIR Air Quality Assessment Report[12] and segment length information from geographic information system (GIS) databases, the VMT was calculated for certain Study Area cities (arterials, open freeways and freeway tunnel) and freeways (open and in a tunnel). Air emissions impact on local arterials and freeways, by city, can be compared for the different build alternatives (relative to the No-Build Alternative) using this VMT information.

NOTE: Overall cancer risk and most air pollution decreases in future years for all areas[13] (see Comment A). This analysis indicates whether those decreases are retarded by the alternatives (increases compared to the future No-Build Alternative) or enhanced by the alternatives. Also, travel through the freeway tunnel must be considered separately when assessing air quality impacts because emissions from those trips will be substantially reduced by the scrubbers/filters in the ventilation systems.

[12] http://www.dot.ca.gov/dist07/resources/envdocs/docs/710study/draft_eir-eis/Air%20Quality%20Analysis/SR%20710%20Air%20Quality%20Analysis%20Vol%20I.pdf

[13] DEIR Air Quality Assessment Report, Table 5-11. Note the comparisons to the existing 2012 conditions.

Local Arterials: Average Daily Trip (ADT) information for truck and total traffic on arterial road segments are presented in the AQAR Appendix D (PM Hot-Spot Analysis), including for the BRT Alternative (AQAR Appendix D Table 8), LRT Alternative (AQAR Appendix D Table 9), and Dual-Bore Tunnel with Tolls (AQAR Appendix D Table 17). VMT can be calculated by multiplying the ADT by the number of miles in the road segment.

Arterial Truck Traffic: Based on the VMT comparisons to the No-Build Alternative,[14] the BRT and LRT Alternative have no appreciable impact on VMT in La Canada / Flintridge, Pasadena, South Pasadena, Alhambra, San Gabriel, and Monterey Park. The Dual-Bore Freeway Tunnel Alternative *decreases* the average arterial truck VMT in Alhambra by 17%. This would result in a proportionate reduction in the major air toxic carcinogen diesel particulate matter (DPM) in this heavily impacted (currently and in the future) community.

All Arterial Traffic: Based on the VMT comparisons to the No-Build Alternative,[15] the BRT Alternative *increases* total VMT five percent on arterials through South Pasadena and San Marino. There are no appreciable changes in arterial total VMT for the LRT Alternative. For the Tolled, Dual-Bore Freeway Tunnel with Tolls Alternative, arterial VMT *decreased* for the cities of South Pasadena, Pasadena, San Gabriel, and Alhambra (-12%, -9%, -7%, and -14%, respectively) compared to the No-Build. VMT *increases* on La Canada/Flintridge arterials by 9% compared to the No-Build; note that La Canada/Flintridge has much lower levels of arterial traffic (~120,000 VMT per day compared to 457,000 in Alhambra) and is an area with lower air quality and health risk than the southern SR710 Gap cities. The following table summarizes the percentage change in all traffic VMT compared to the No-Build Alternative in select cities.

	BRT	LRT	Dual-Bore Tunnel with Tolls
La Canada / Flintridge	0%	-	+9%
Pasadena	0%	-	-9%
South Pasadena	+5%	+3%	-12%
San Gabriel	-2%	-2%	-7%
Alhambra	0%		-14%

VMT decreases on arterials are directly related to emission reductions. If there is increased mobility on the arterials (i.e., faster average speeds), then there will be an additional emissions reduction effect (see Figure 4 of this Memorandum for example emission-speed graphs for trucks and cars). Gibson Transportation Consulting, Inc. has determined that only the Tunnel alternatives reduce traffic throughout the San Gabriel

[14] VMT comparisons were made by determining the ADT for the Build and No-Build Alternatives for each segment and then multiplying by the number of miles in each segment. Percent changes in VMT were calculated, unless actual VMT was relatively small, i.e., the actual difference in VMT was less than 10,000 for all vehicles or 1,000 for trucks).

[15] VMT comparisons were made by determining the ADT for the Build and No-Build Alternatives for each segment and then multiplying by the number of miles in each segment. Percent changes in VMT were calculated, unless actual VMT was relatively small, i.e., the actual difference in VMT was less than 10,000 for all vehicles or 1,000 for trucks).

Valley; thus, we would expect higher average speeds on these less congested arterials. This should enhance the emission reductions on San Gabriel Valley arterials resulting from the VMT reductions for the Dual-Bore Tunnel with Tunnel Alternative discussed above.

Arterial Summary: Only the Freeway Tunnel alternatives meaningfully enhance the overall improvements in air quality and public health that historically impacted southern SR710 Gap communities will experience. This is also true of Pasadena, South Pasadena, and San Gabriel. Reductions of emissions in La Canada/Flintridge arterials will be retarded, although the area will continue to have relatively better air quality. The BRT Alternative increases VMT on arterials in San Marino and South Pasadena, retarding future improvements in those areas.

D. ***The FEIR should note that only a Tunnel alternative can reduce emissions by reducing vehicle miles travelled and increasing mobility on several freeways (SR2, I5, and SR110) and reduce SR710 traffic emissions up to 80% or more because of the filtered/scrubbed tunnel ventilation system.***

The Freeway Tunnel is a unique opportunity for cleaner air: Mobile source emissions have historically been controlled at the tailpipe. California has the most stringent car and truck tailpipe emissions standards in the nation. Cancer risk reductions from 2012 discussed above in Comment B are a direct result of new cars and trucks replacing older and far more emitting vehicles on the road. Particulate matter, which is associated with premature mortality and morbidity impacts, comes from vehicle brake, tire wear, and road dust that cannot be reduced by tailpipe emission controls. It is for this reason that incremental increases in VMT alone CANNOT be used to imply that the Freeway Tunnel Alternatives will result in increased air quality and/or health risk impacts.

> ***A Freeway Tunnel with the proposed control technologies (i.e., electrostatic precipitators, scrubbers), can reduce roadway emissions now, on vehicles of all model years. All particulate matter, not just tailpipe emissions, can be reduced 80% or more.[16] No other alternative offers this opportunity.***

Freeways in the Study Area: Based on the VMT data comparisons to the No-Build Alternative, the BRT Alternative and the LRT Alternative do not have an appreciable effect on VMT levels with the exception of an 8% increase in VMT on the freeways running through Monterey Park. For the Freeway Tunnel Alternative, it is very important to differentiate between open freeways and freeways running in an underground tunnel with ventilation systems equipped with air scrubbers / filters. Although emissions are generally a function of VMT, they are directly a function of the level of control. For example, a freeway tunnel with the minimum 80% control efficiency for particulates would have the

[16] http://www.dot.ca.gov/dist07/resources/envdocs/docs/710study/draft_eir-eis/Tunnel%20Systems%20Report/SR710%20Tunnel%20Systems%20Report.pdf Section 5.5 and http://www.dot.ca.gov/dist07/resources/envdocs/docs/710study/draft_eir-eis/Health%20Risk%20Assessment/SR%20710%20Health%20Risk%20Assessment%20Vol%20I.pdf Section 2.2.2.1

same emissions as an open freeway with one-fifth of the VMT. Said another way, freeway tunnels emit over 5x less particulate emissions than a surface freeway for the same number of cars and trucks. The Dual-Bore Tunnel with Tolls has 68,000 truck VMT where the air is scrubbed/filtered and reduces open freeway truck VMT by 42,300 VMT. This would be expected to be a net air quality and public health benefit for the region. The largest truck VMT decreases in the Study Area (compared to No-Build) would on SR2 (-31,000), I5 (-15,000); even SR-134 truck VMT decreases appreciably (-7,000). Freeway truck VMT on the I210 would increase 15,500 in the Study Area. Changes in freeway truck VMT on the current I710 and I10 essentially offset each other. All SR2 VMT (cars and trucks) decreases substantially (-159,000 VMT or -15% from No-Build), with VMT on the I5 and SR110 also decreasing 35,000 to 40,000 VMT (~3% to 5%). Emissions from cars as well as trucks will be reduced because of the freeway tunnel ventilation / scrubber / filter systems. The following table presents the percentage change in VMT on existing freeways for the Dual-Bore Tunnel with Tolls Alternative compared to the No-Build Alternative.

	VMT % change Trucks	VMT % Change All Traffic
I210	+3%	+3%
SR2	-39%	-15%
I5	-10%	-3%
SR134	-6%	+2%
I10	-6%	+1%
I605	-6%	-3%
SR110	NA	-5%

Freeway Summary: Only the Freeway Tunnel Alternative appreciably reduces open (non-tunnel) freeway truck VMT in the Study Area, particularly on the SR2 and I5. Total VMT on some major freeways (SR2, I5) would be reduced, although there would be slightly higher percentage of VMT on the I210. The fully completed SR710 would have higher VMT compared to the No-Build, but the majority of that VMT will be in the freeway tunnel; any emissions related to VMT in the tunnel would be significantly reduced because of the tunnel's ventilation/scrubber/filter systems.

E. ***The DEIR does not provide enough information to assess impacts of Tunnel alternatives in the western and southern parts of East Los Angeles because it only provides information about increased traffic on the SR710 freeway in northern East Los Angeles and does not provide information to assess expected emission reductions from reduced pass-through traffic currently going to the I5 and I-60.***

Most of East Los Angeles is not in the SR710 Study Area or the slightly larger dispersion modeling domain (see Memorandum Figures 5 and 6, respectively). Similarly, the I710 - SR60 - I5 "triangle" is not included as a source of traffic emissions or the

dispersion modeling of impacts. Most of the arterial streets in East Los Angeles are not included in the emission calculations or dispersion modeling of impacts. However, the portion of SR710 from SR60 to the I10 is included in the SR710 Study Area and its emissions are included in the dispersion modeling.

Tunnel alternatives do increase VMT along the portion of SR710 from SR60 to the I10, but it is unknown where and to what degree traffic reductions are likely occurring in the I710-SR60-I5 triangle of freeways and arterials or arterials to the east of the I710. This is important, because if better mobility along the SR710 is reducing traffic along the heavily congested I5 and the arterials in East Los Angeles, one would expect concomitant emission and risk reductions in those areas. However, the actual impact in East Los Angeles cannot be determined with the information in the DEIR/DEIS.

F. ***The DEIR Response to Comments should explicitly describe that a Tunnel Alternative is the only Alternative that further reduces air emissions and health risks (e.g., cancer risks) in areas that have had the worst air quality and health risk impacts for years because of the SR710 Gap.***

The existing setting for air quality clearly shows that areas near where the I710 ends in Alhambra and further south in Monterey Park and East Los Angeles have significantly greater cancer risks than areas to the north, including Pasadena and La Canada / Flintridge. This is due, in part, to the SR710 Gap causing additional emissions related to increased congestion, slower traffic, and longer diversions to slower arterial roadways.

The current Health Risk Assessment maps are confusing in their color composition, implying the Tunnel would increase risk in the greater Alhambra / San Gabriel area (darker colors), when the Tunnel alternatives are the ONLY alternatives that further reduce risk in those areas compared to the No-Build Alternative (see HRA Figures 3-11 through 3-19 and Memorandum Figure 3). We suggest that decreases in risk be noted using green variations (not the dark gray, which implies a dis-benefit) and increases in risk be noted using gray or orange variations (not the green/yellow used in the current maps, which imply benefits or lower risk impacts). The colors and legend should have consistent intervals for increases and decreases in risk (e.g., 10, 50, 100, 300). Although Caltrans and/or FHWA have not established health risk thresholds, it should be noted in the text that the South Coast Air Quality Management District has promulgated a significance threshold of 10 in a million cancer risk for CEQA analyses and that none of the Build alternatives, including the dual-bore Tunnel Alternative with trucks, result in any increase in cancer risk compared to the 2012 baseline. The revised color scheme and more proportionate risk intervals will clearly show that only a Tunnel alternative (and the dual-bore tunnel in particular) reduces risk in areas with the greatest risk in the existing setting.

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FIGURES

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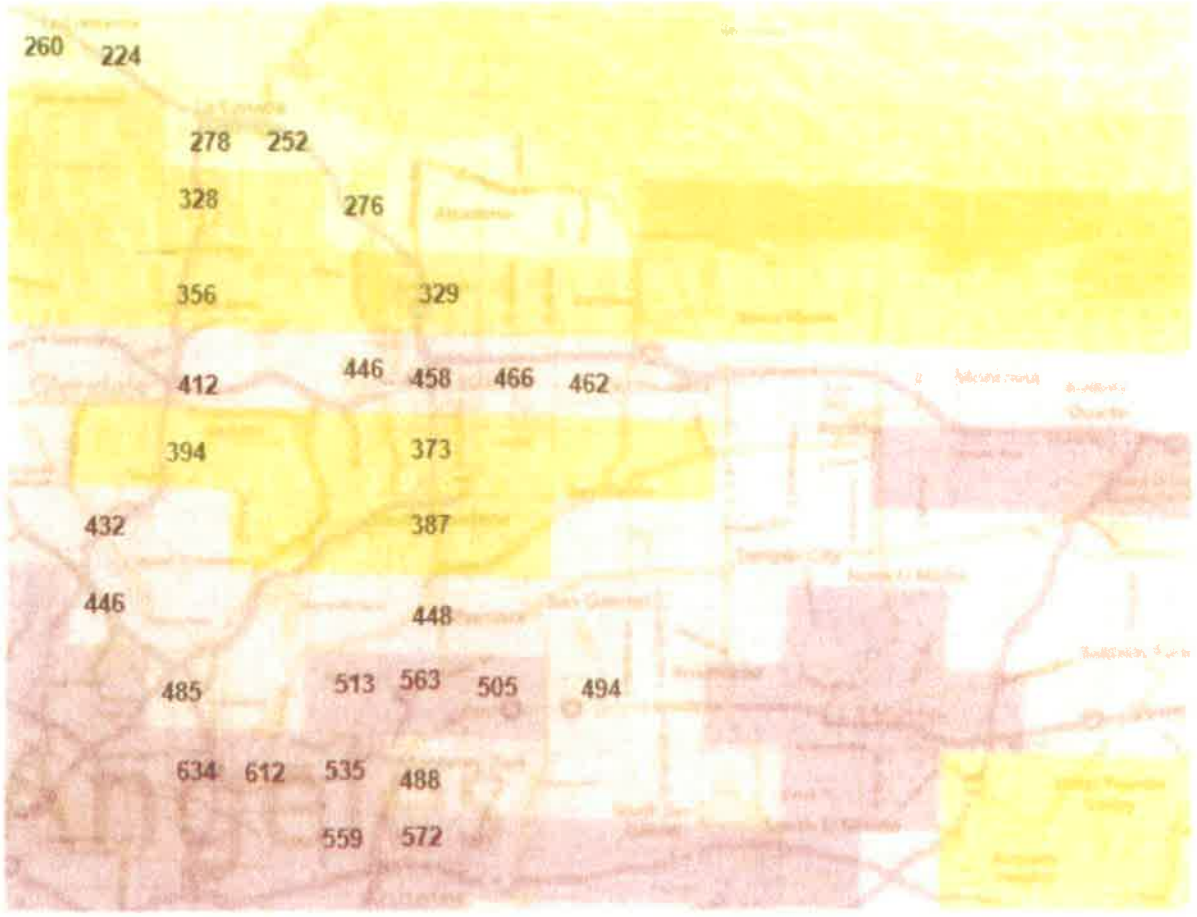
Figure 1: 2012/2013 Cancer Risk in a Million at Selected Locations in the SR710 Study Area



South Coast Air Quality Management District (SCAQMD) 2015 Multiple Air Toxics Exposure Study (MATES IV) Interactive Map (Cancer Risk in a Million from Air Pollution)

Values taken from the MATES IV Carcinogenic Risk Interactive Map at http://www3.aqmd.gov/webappl/OI.Web/OI.aspx?jurisdictionID=AQMD.gov&shareID=73f55d6b-82cc-4c41-b779-4c48c9a8b15b

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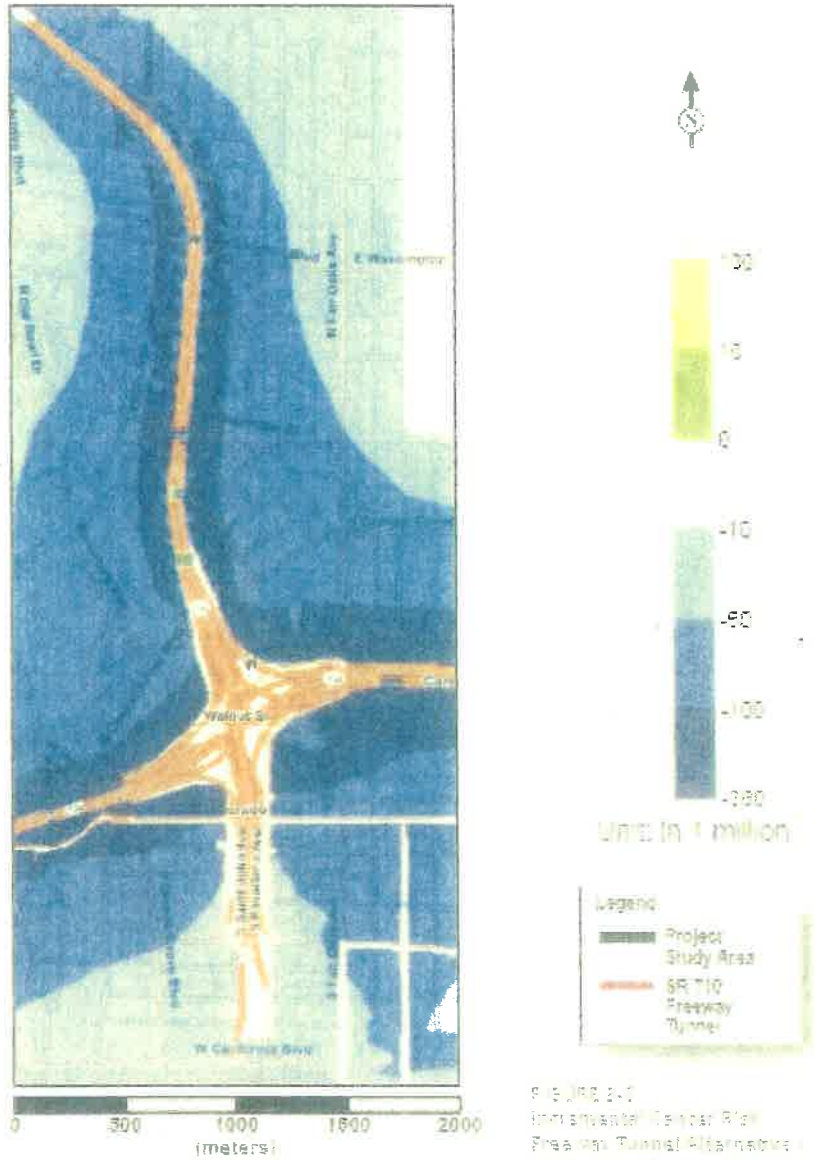
Figure 2: Cancer Risk for the Dual-Bore Tunnel with Tolls and Trucks Alternative (Worst-Case) is 10 to 300+ in a Million Lower Than in 2012 Base Year



North Portal Area

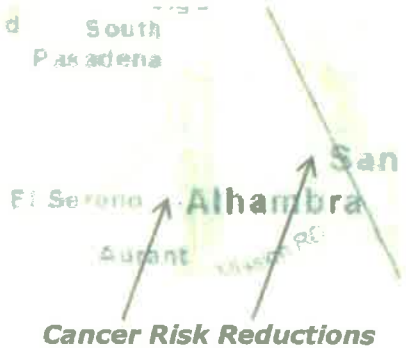
Figure 3: Dual-Bore Tunnel with Tolls and Trucks Reduces Cancer Risk in greater El Sereno / Alhambra / San Gabriel Area Compared to the No-Build Alternative (BRT and LRT Increase Cancer Risk for This Historically Impacted Area Compared to the No-Build Alternative)

NOTE: Green is *increase* in cancer risk between 0 and 10 in a million
Light grey is *decrease* in cancer risk between 0 and 10 in a million
Darker grey is a *decrease* in cancer risk between 10 and 50 in a million
Darkest grey is a *decrease* in cancer risk between 50 and 100 in a million

Bus Rapid Transit (BRT) Alternative:

Light-Rail Transit (LRT) Alternative:

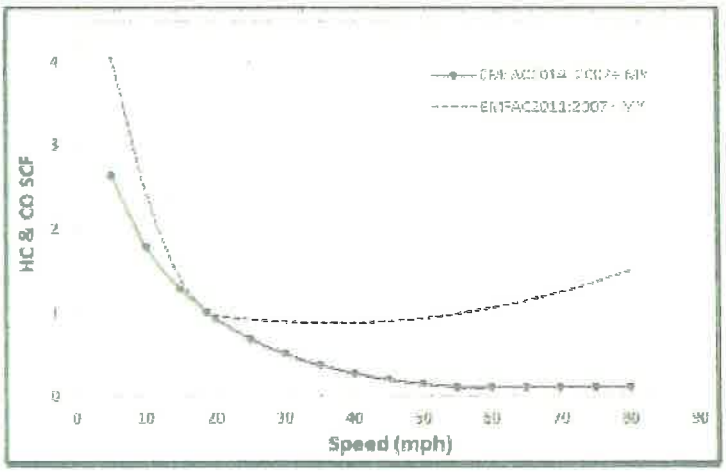
Dual-Bore Tunnel with Tolls and Trucks:

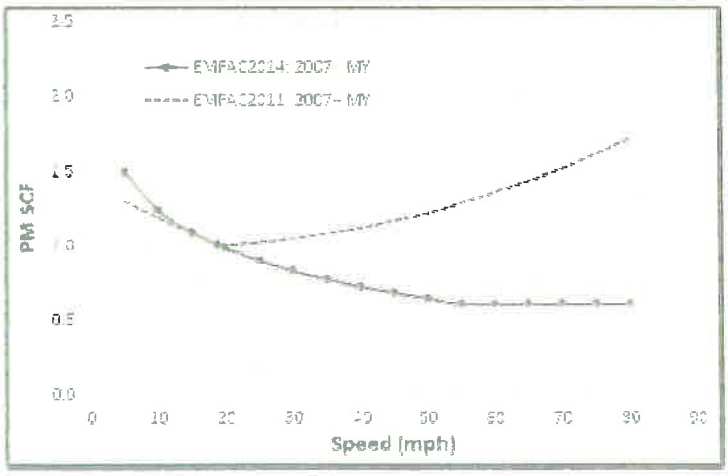


(BRT: HRA Figure 3-12; LRT: HRA Figure 3-13; Dual-Bore Tunnel: HRA Figure 3-17)

Figure 4: Emission-Speed Graphs (examples)

From CARB EMFAC2014-vol3-technical-documentation-052015,[17] Figure 6.2-1:
NOx Emission Speed Correction Factor (or SCF) vs. Speed Curve
for Heavy-Heavy Duty Trucks (EMFAC = EMission FACtor)





[17] EMFAC2014 Technical Documentation, Volume 3. California Air Resources Board. May 2015.
http://www.arb.ca.gov/msei/downloads/emfac2014/emfac2014-vol3-technical-documentation-052015.pdf

Figure 5: SR710 Study Area (from HRA Figure 1-1)
[*Crimson lines are approximate outline of East Los Angeles*]

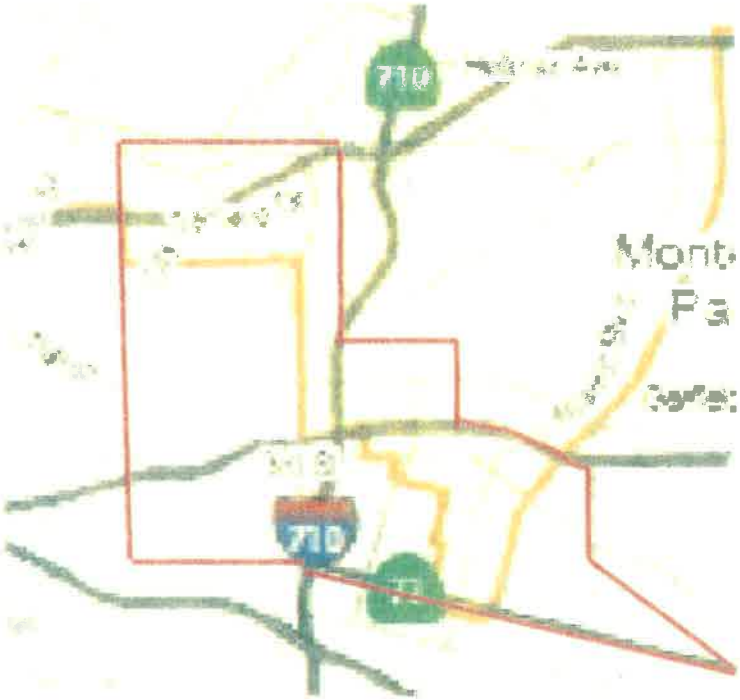


Figure 6: SR710 Modeling Sources and Receptors (from HRA Figure 2-1)