3.2.6 Air Quality

Regulatory Setting

The federal Clean Air Act (CAA), as amended, is the primary federal law that governs air quality, while the California Clean Air Act is its companion state law. These laws, and related regulations by the U.S. Environmental Protection Agency (EPA) and California Air Resources Board (ARB), set standards for the concentration of pollutants in the air. At the federal level, these standards are called National Ambient Air Quality Standards (NAAQS). NAAQS and state ambient air quality standards have been established for six transportation-related criteria pollutants that have been linked to potential health concerns: carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM) which is broken down for regulatory purposes into particles of 10 micrometers or smaller (PM_{10}) and particles of 2.5 micrometers and smaller ($PM_{2.5}$), and sulfur dioxide (SO_2). In addition, national and state standards exist for lead (Pb), and state standards exist for visibility-reducing particles, sulfates, hydrogen sulfide (H_2S), and vinyl chloride. The NAAQS and state standards are set at levels that protect public health with a margin of safety and are subject to periodic review and revision. Both state and federal regulatory schemes also cover toxic air contaminants (air toxics); some criteria pollutants are also air toxics or may include certain air toxics in their general definition.

Federal air quality standards and regulations provide the basic scheme for project-level air quality analysis under the National Environmental Policy Act (NEPA). In addition to this environmental analysis, a parallel “Conformity” requirement under the federal CAA also applies.

Conformity

The conformity requirement is based on federal CAA Section 176(c), which prohibits the U.S. Department of Transportation (DOT) and other federal agencies from funding, authorizing, or approving plans, programs, or projects that do not conform to State Implementation Plan (SIP) for attaining the NAAQS. “Transportation Conformity” applies to highway and transit projects and takes place on two levels: the regional—or planning and programming—level and the project level. The proposed project must conform at both levels to be approved.

Conformity requirements apply only in nonattainment and “maintenance” (former nonattainment) areas for the NAAQS, and only for the specific NAAQS that are or were violated. EPA regulations at 40 *Code of Federal Regulations* (CFR) 93 govern the conformity process. Conformity requirements do not apply in unclassifiable/ attainment areas for NAAQS and do not apply at all for state standards regardless of the status of the area.

Regional conformity is concerned with how well the regional transportation system supports plans for attaining the NAAQS for CO, NO_2, O_3, particulate matter (PM_{10} and $PM_{2.5}$), and in some areas (although not in California), SO_2. California has nonattainment or maintenance areas for all of these transportation-related “criteria pollutants” except SO_2, and also has a nonattainment area for Pb; however, Pb is not

currently required by the federal CAA to be covered in transportation conformity analysis. Regional conformity is based on emission analysis of Regional Transportation Plans (RTPs) and Federal Transportation Improvement Programs (FTIPs) that include all transportation projects planned for a region over a period of at least 20 years for the RTP and 4 years for the FTIP. RTP and FTIP conformity uses travel demand and emission models to determine whether or not the implementation of those projects would conform to emission budgets or other tests at various analysis years showing that requirements of the Clean Air Act and the SIP are met. If the conformity analysis is successful, the Metropolitan Planning Organization (MPO), Federal Highway Administration (FHWA), and Federal Transit Administration (FTA) make determinations that the RTP and FTIP are in conformity with the SIP for achieving the goals of the Clean Air Act. Otherwise, the projects in the RTP and/or FTIP must be modified until conformity is attained. If the design concept, scope, and "open-to-traffic" schedule of a proposed transportation project are the same as described in the RTP and FTIP, then the proposed project meets regional conformity requirements for purposes of project-level analysis.

Conformity analysis at the project-level includes verification that the project is included in the regional conformity analysis and a "hot-spot" analysis if an area is "nonattainment" or "maintenance" for CO and/or particulate matter (PM_{10} or $PM_{2.5}$). A region is "nonattainment" if one or more of the monitoring stations in the region measures a violation of the relevant standard and EPA officially designates the area nonattainment. Areas that were previously designated as nonattainment areas but subsequently meet the standard may be officially redesignated to attainment by EPA and are then called "maintenance" areas. "Hot-spot" analysis is essentially the same, for technical purposes, as CO or particulate matter analysis performed for NEPA purposes. Conformity does include some specific procedural and documentation standards for projects that require a hot-spot analysis. In general, projects must not cause the "hot-spot"-related standard to be violated and must not cause any increase in the number and severity of violations in nonattainment areas. If a known CO or particulate matter violation is located in the project vicinity, the project must include measures to reduce or eliminate the existing violation(s) as well.

Affected Environment

Information in this section comes from the Air Quality Report (August 2014) for the project. Detailed analysis methodology, modeling files, and calculation worksheets can be found in the Air Quality Report.

Climate and Meteorology

The project site is located in the Mojave Desert Air Basin (MDAB) within the jurisdictional boundaries of the Antelope Valley Air Quality Management District (AVAQMD) and Mojave Desert Air Quality Management District (MDAQMD). The MDAB is comprised of four air districts; the Kern County Air Pollution Control District (APCD), the AVAQMD, the MDAQMD, and the eastern portion of the South Coast Air Quality Management District (SCAQMD). The AVAQMD covers the western portion of the proposed project in Los Angeles County, while the MDAQMD

covers the eastern portion of the proposed project in San Bernardino County. The MDAQMD's boundaries encompass San Bernardino County's High Desert and the Blythe portion of Riverside County.

The climatological station from each jurisdictional area of the AVAQMD and MDAQMD that is closest to the project corridor are the Lancaster/Palmdale Station (#046624) and Victorville Station (#049325) maintained by the Western Regional Climate Center.

Los Angeles County's (AVAQMD/MDAB) Climate Conditions

The climate of the Antelope Valley is characterized by hot summers, mild winters, infrequent rainfall, moderate afternoon breezes, and generally fair weather. The most important weather pattern is associated with the daily onshore sea breeze, which funnels through Soledad Canyon into the upper desert to the north of the heavily developed portions of the Los Angeles Basin. This daily air flow brings polluted air into the area late in the afternoon from late spring to early fall.

Winds blow mainly from south to north and from west to east. These winds are moderately strong during the daytime, averaging from 10 to 13 miles per hour (mph), but they become light and variable at night. Daytime ventilation is very good, but there may be nocturnal stagnation. The primary Antelope Valley air quality concern is that there is a general transport of air from the polluted Los Angeles Basin through the Santa Clarita Valley, and then toward the normally cleaner upper desert, especially during the summer smog season.

In addition to winds that control the rate and direction of pollution dispersal, southern California is notorious for strong temperature inversions that limit the vertical depth through which pollution can be mixed. Inversions are layers in the atmosphere where the temperature increases with height instead of decreasing as is normal. Air starting onshore at the beach is relatively clean, but it becomes progressively more polluted as sources continue to add pollution from below without much dilution from above. Some dilution occurs in the thermal chimneys along the heated slopes of the San Gabriel Mountains, but not enough to prevent the intrusion of significantly polluted air into the Antelope Valley.

Hot summers, cold winters, and widely varying daily temperatures characterize the climate in the Antelope Valley. The annual average maximum temperature recorded from January 1981 to December 2010 at the Palmdale Station is 78.0 degrees Fahrenheit (°F), and the annual average minimum is 48.4°F, but it gets very hot on summer afternoons (close to or over 100°F) and quite cool on winter mornings (around 30°F).

Rainfall in the Antelope Valley area varies considerably in both space and time. Almost all of the annual rainfall comes from the fringes of mid-latitude storms from late November to early April, with summers often completely dry except for occasional widely scattered summer thundershowers. The Antelope Valley is located in a transition area between the semi-arid conditions of the Los Angeles Basin and the

completely arid portions of the Mojave Desert. The annual average precipitation from January 1981 to December 2010 is recorded at 7.48 inches at the Palmdale Station. The Antelope Valley may occasionally experience a light winter snowfall.

San Bernardino County's (MDAQMD/MDAB) Climate Conditions

The High Desert is classified as an arid desert climate. In the Mojave Desert, this is modified by the San Bernardino and San Jacinto mountains forming barriers to prevent precipitation. The rain shadow causes the aridity of the High Desert climate, while leaving the summers hot and the winters generally mild.

Prevailing winds in the MDAB are out of the west and southwest. The MDAB is separated from the southern California coastal and central California valley regions by mountains (highest elevation approximately 10,000 feet), whose passes form the main channels for these winds.

There are two types of inversions affecting the High Desert. The first is the regional inversions caused by subsiding air within the high-pressure systems that dominate the summer weather. These subsidence inversions can occur at varying altitudes, with corresponding variable effects on the pollution levels. The lower the inversion level, the greater the concentration of pollutants results between it and the ground. The second type is the radiation inversion that forms when the ground cools rapidly after sunset, cooling the air immediately above it at the same time. Radiation inversions can cause significant concentrations of pollutants because they are generally only a few hundred feet above the ground and are strongest during the early morning commuting time. Especially in the desert, rapid heating of the ground usually disperses radiation inversions within an hour of sunrise.

Average high temperatures in summer are in the mid 90s to 100°F. Average low temperatures are in the mid 60s to 70s. Average high temperatures in winter are in the mid 50s, and average low temperatures are in the mid 30s. The annual average maximum temperature recorded from January 1981 to December 2010 at the Victorville Station is 77.5°F, and the annual average minimum is 43.8°F.

The Mojave Desert receives precipitation from winter cold fronts and moist southerly air masses during the late summer. Annual average precipitation for the same period is recorded at 5.56 inches at the Victorville Station. Summer thunderstorms bring highly variable amounts of localized rain.

Attainment Status

Criteria pollutants are defined as those pollutants for which the federal and state governments have established ambient air quality standards, or criteria, for outdoor concentrations to protect public health and prevent degradation of the environment. The standards for these pollutants are shown in Table 3.2.6-1.

Table 3.2.6-1 State and Federal Criteria Air Pollutant Standards

Ambient Air Quality Standards						
Pollutant	Averaging Time	California Standards [1]		National Standards [2]		
		Concentration [3]	Method [4]	Primary [3,5]	Secondary [3,6]	Method [7]
Ozone (O_3)	1 Hour	0.09 ppm (180 µg/m^3)	Ultraviolet Photometry	—	Same as Primary Standard	Ultraviolet Photometry
	8 Hour	0.070 ppm (137 µg/m^3)		0.075 ppm (147 µg/m^3)		
Respirable Particulate Matter (PM10)[8]	24 Hour	50 µg/m^3	Gravimetric or Beta Attenuation	150 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m^3		—		
Fine Particulate Matter (PM2.5)[8]	24 Hour	—	—	35 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m^3	Gravimetric or Beta Attenuation	12.0 µg/m^3	15 µg/m^3	
Carbon Monoxide (CO)	1 Hour	20 ppm (23 mg/m^3)	Non-Dispersive Infrared Photometry (NDIR)	35 ppm (40 mg/m^3)	—	Non-Dispersive Infrared Photometry (NDIR)
	8 Hour	9.0 ppm (10 mg/m^3)		9 ppm (10 mg/m^3)	—	
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m^3)		—	—	
Nitrogen Dioxide (NO_2)[9]	1 Hour	0.18 ppm (339 µg/m^3)	Gas Phase Chemiluminescence	100 ppb (188 µg/m^3)	—	Gas Phase Chemiluminescence
	Annual Arithmetic Mean	0.030 ppm (57 µg/m^3)		0.053 ppm (100 µg/m^3)	Same as Primary Standard	
Sulfur Dioxide (SO_2)[10]	1 Hour	0.25 ppm (655 µg/m^3)	Ultraviolet Fluorescence	75 ppb (196 µg/m^3)	—	Ultraviolet Flourescence; Spectrophotometry (Pararosaniline Method)
	3 Hour	—		—	0.5 ppm (1300 µg/m^3)	
	24 Hour	0.04 ppm (105 µg/m^3)		0.14 ppm (for certain areas)[10]	—	
	Annual Arithmetic Mean	—		0.030 ppm (for certain areas)[10]	—	
Lead[11,12]	30 Day Average	1.5 µg/m^3	Atomic Absorption	—	—	High Volume Sampler and Atomic Absorption
	Calendar Quarter	—		1.5 µg/m^3 (for certain areas)[12]	Same as Primary Standard	
	Rolling 3-Month Average	—		0.15 µg/m^3		
Visibility Reducing Particles[13]	8 Hour	See footnote 13	Beta Attenuation and Transmittance through Filter Tape	No National Standards		
Sulfates	24 Hour	25 µg/m^3	Ion Chromatography			
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m^3)	Ultraviolet Fluorescence			
Vinyl Chloride[11]	24 Hour	0.01 ppm (26 µg/m^3)	Gas Chromatography			

See footnotes on next page ...

For more information please call ARB-PIO at (916) 322-2990 California Air Resources Board (6/4/13)

1. California standards for ozone, carbon monoxide (except 8-hour Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, and particulate matter (PM10, PM2.5, and visibility reducing particles), are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

2. National standards (other than ozone, particulate matter, and those based on annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over three years, is equal to or less than the standard. For PM10, the 24 hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 $\mu g/m^3$ is equal to or less than one. For PM2.5, the 24 hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact the U.S. EPA for further clarification and current national policies.

3. Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

4. Any equivalent measurement method which can be shown to the satisfaction of the ARB to give equivalent results at or near the level of the air quality standard may be used.

5. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

6. National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

7. Reference method as described by the U.S. EPA. An "equivalent method" of measurement may be used but must have a "consistent relationship to the reference method" and must be approved by the U.S. EPA.

8. On December 14, 2012, the national annual PM2.5 primary standard was lowered from 15 $\mu g/m^3$ to 12.0 $\mu g/m^3$. The existing national 24-hour PM2.5 standards (primary and secondary) were retained at 35 $\mu g/m^3$, as was the annual secondary standard of 15 $\mu g/m^3$. The existing 24-hour PM10 standards (primary and secondary) of 150 $\mu g/m^3$ also were retained. The form of the annual primary and secondary standards is the annual mean, averaged over 3 years.

9. To attain the 1-hour national standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 ppb. Note that the national 1-hour standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the national 1-hour standard to the California standards the units can be converted from ppb to ppm. In this case, the national standard of 100 ppb is identical to 0.100 ppm.

10. On June 2, 2010, a new 1-hour SO_2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO_2 national standards (24-hour and annual) remain in effect until one year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.

    Note that the 1-hour national standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the 1-hour national standard to the California standard the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm.

11. The ARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

12. The national standard for lead was revised on October 15, 2008 to a rolling 3-month average. The 1978 lead standard (1.5 $\mu g/m^3$ as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

13. In 1989, the ARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are "extinction of 0.23 per kilometer" and "extinction of 0.07 per kilometer" for the statewide and Lake Tahoe Air Basin standards, respectively.

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As shown in Table 3.2.6-2, the MDAB within the AVAQMD (in Los Angeles County portion) has been designated as nonattainment of the federal and state O_3 (8-hour) standards, as well as for the state PM_{10} standard. This area is unclassified or in attainment of the federal and state standards for CO; the federal standard for PM_{10}; and the federal and state standards for $PM_{2.5}$.

Table 3.2.6-2 Designations of Criteria Pollutants in the MDAB within the AVAQMD (Los Angeles County Portion)

Pollutants	Federal	State
O_3 (8-hour)	Nonattainment	Nonattainment
CO	Attainment	Attainment
PM_{10}	Unclassified /Attainment	Nonattainment
$PM_{2.5}$	Unclassified /Attainment	Unclassified /Attainment
NO_2	Unclassified /Attainment	Unclassified /Attainment

Notes:
1. The Federal 1-hour ozone (O_3) standard was rescinded effective June 15, 2005, with implementation of the 8-hour standard.
2. Effective August 23, 2010, 8-hour NAAQS at 75 parts per billion (ppb), nonattainment is expected; 24-Hour and Annual NAAQS was revoked.

Sources: http://pd.dot.ca.gov/env/air/html/areadesig/canafed_index.htm, http://www.epa.gov/region9/air/maps/pdfs/AIR1100018_7.pdf

As shown in Table 3.2.6-3, the MDAB within the MDAQMD (in San Bernardino County portion) has been designated as nonattainment of the federal and state standards for O_3 (8-hour) and PM_{10}. This area is also in nonattainment of the state standard for $PM_{2.5}$. This area, however, is unclassified or in attainment of the federal and state standards for CO and federal standard for $PM_{2.5}$.

Table 3.2.6-3 Designations of Criteria Pollutants in the MDAB within the MDAQMD (San Bernardino County Portion)

Pollutants	Federal	State
O3 (8-hour)	Nonattainment	Nonattainment
CO	Attainment	Attainment
PM10	Nonattainment, Moderate	Nonattainment
PM2.5	Unclassified/Attainment	Nonattainment
NO2	Unclassified/Attainment	Unclassified/Attainment

Notes:
1. The Federal 1-hour ozone (O_3) standard was rescinded effective June 15, 2005, with implementation of the 8-hour standard.
2. Effective August 23, 2010, 8-hour NAAQS at 75 ppb, nonattainment is expected; 24-Hour and Annual NAAQS was revoked.

Sources: http://pd.dot.ca.gov/env/air/html/areadesig/canafed_index.htm, http://www.epa.gov/region9/air/maps/pdfs/AIR1100018_7.pdf

The MDAB has an approved 2004 Ozone SIP (Attainment Plan), an adopted 2008 8-hour Ozone SIP (Attainment Plan). The 2008 Ozone SIP was submitted in February

2008, but this plan has not been approved by EPA due to the region exceeding the federal 8-hour O_3 standards 14 days in that year.

Transportation conformity for O_3 is demonstrated by the project being listed in the currently conforming RTP and FTIP. The HDC Project is in the 2012 RTP Amendment 1 (Project Identification Numbers: 1C0404, LA962212, LA0G665, and SB20020144). The Southern California Association of Governments (SCAG) adopted the plan on April 4, 2012. FHWA and FTA made a conformity finding for the plan on June 4, 2012. The project is also included in SCAG's financially constrained 2013 FTIP No. 13-15, page 10 for Los Angeles County and page 8 for San Bernardino County. The SCAG 2013 FTIP was determined to conform by FHWA and FTA on December 18, 2013. The design concept and scope of the proposed project is consistent with the project description in the 2012 RTP, 2013 FTIP, and the "open to traffic" assumptions of the SCAG's regional emissions analysis.

Currently, the MDAB has two PM_{10} SIPs pending adequacy finding with no prior approval. The two PM_{10} SIPs are the 1995 PM_{10} SIP for MDAB (excluding Searles Valley) and the 1996 PM_{10} SIP for Searles Valley, which are still pending adequacy findings due to the different motor vehicle emissions not being combined into clearly defined budgets consistent with the federal conformity regulations. The MDAB has been designated as an attainment area for PM_{10} federal standard, but it is designated as a nonattainment area for the state PM_{10} and $PM_{2.5}$ standards.

Local Ambient Air Quality

The California ARB and the AVAQMD and MDAQMD maintain a network of air quality monitoring stations located throughout the Basin. The nearest most representative air monitoring stations to the project site are the Lancaster/Palmdale Station (#046624) and Victorville Station (#049325) maintained by the Western Regional Climate Center. The Lancaster/Palmdale Station is approximately 1.3 miles east of SR-14 and approximately 5 miles north of the proposed HDC alignment. The Victorville Station is located approximately 0.2 mile west of I-15 and 0.25 mile north of SR-18. All criteria pollutants except SO_2 are monitored at this station (i.e., O_3, CO, NO_2, PM_{10}, and $PM_{2.5}$). Figure 3.2.6-1 presents the location of these monitoring stations. Tables 3.2.6-3 and 3.2.6-4 present ambient air quality data that were recorded at these stations from 2007 through 2012. Tables 3.2.6-4 and 3.2.6-5 show the following trends in local ambient criteria pollutant concentrations:

- **Ozone –** The maximum 1-hour O_3 concentration recorded during the 2007 to 2012 period was 0.122 parts per million (ppm). During this period, the California standard of 0.09 ppm was exceeded between 11 and 22 times annually, with the highest number of exceedances recorded in 2009. The 8-hour O_3 national standard was never exceeded. The 8-hour O_3 standard state standard was exceeded every year, and the highest number of exceedances occurred in 2010.
- **Fine Particulate Matter ($PM_{2.5}$) –** During the recorded period of 2007 to 2012, the maximum 24-hour concentrations recorded was 50 micrograms per cubic meter ($\mu g/m^3$). During the 2007 to 2012 period, the national standard of 35 $\mu g/m^3$was exceeded only once, in 2011.

Figure 3.2.6-1 Mojave Desert Air Basin Monitoring Stations

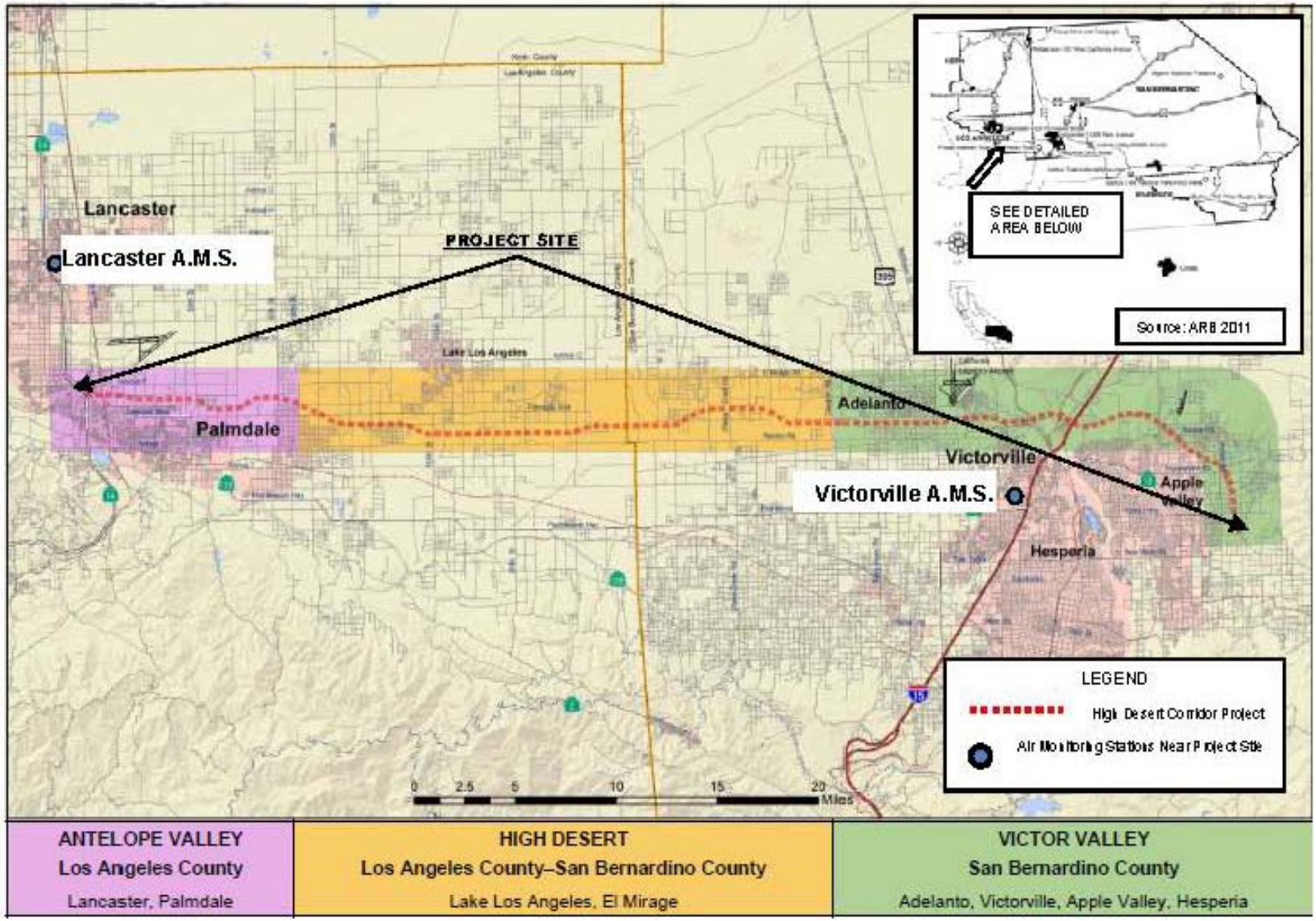


Table 3.2.6-4 Ambient Monitoring Data at Lancaster/Palmdale Station

Pollutant Standards	2007	2008	2009	2010	2011	2012
1-Hour Ozone						
Maximum 1-hour concentration (ppm)	0.118	0.116	0.122	0.107	0.115	0.112
1-hour California designation value	0.13	0.12	0.12	0.11	0.11	0.11
1-hour expected peak-day concentration	0.126	0.118	0.117	0.114	0.113	0.108
Number of days standard exceeded[1]						
CAAQS 1-hour (> 0.09 ppm)	16	18	22	11	19	13
8-Hour Ozone						
National maximum 8-hour concentration (ppm)	0.118	0.116	0.122	0.107	0.115	0.112
National second-highest 8-hour concentration (ppm)	0.116	0.115	0.166	0.104	0.115	0.106
State maximum 8-hour concentration (ppm)	0.101	0.103	0.102	0.096	0.100	0.096
State second-highest concentration (ppm)	0.096	0.096	0.098	0.095	0.098	0.089
8-hour national designation value	0.095	0.094	0.093	0.091	0.091	0.089
8-hour California designation value	0.106	0.103	0.103	0.098	0.102	0.098
8-hour expected peak-day concentration	0.107	0.104	0.103	0.101	0.102	0.099
Number of days standard exceeded[1]						
NAAQS 8-hour (> 0.075 ppm)	0	0	0	0	0	0
CAAQS 8-hour (> 0.070 ppm)	63	59	70	78	76	72
Carbon Monoxide (CO)						
National[2] maximum 8-hour concentration (ppm)	2.5	2.2	1.8	1.8	2.3	1.9
National[2] second-highest 8-hour concentration (ppm)	2.3	1.7	1.8	1.6	1.6	1.8
California[3] maximum 8-hour concentration (ppm)	1.25	1.04	1.00	1.23	1.33	1.00
California[3] second-highest 8-hour concentration (ppm)	1.16	1.03	0.94	1.01	1.20	0.99
Maximum 1-hour concentration (ppm)	2.5	2.2	1.8	1.8	2.3	1.9
Second-highest 1-hour concentration (ppm)	2.3	1.7	1.8	1.6	1.6	1.8
Number of days standard exceeded[1]						
NAAQS 8-hour (> 9.0 ppm)	0	0	0	0	0	0
CAAQS 8-hour (> 9.0 ppm)	0	0	0	0	0	0
NAAQS 1-hour (> 35 ppm)	0	0	0	0	0	0
CAAQS 1-hour (> 20 ppm)	0	0	0	0	0	0

Table 3.2.6-4 Ambient Monitoring Data at Lancaster/Palmdale Station

Pollutant Standards	2007	2008	2009	2010	2011	2012
Particulate Matter (PM_{10})[4]						
National[2] maximum 24-hour concentration (µg/m^3)	75.0	73.0	60.0	39.0	51.0	47.0
National[2] second-highest 24-hour concentration (µg/m^3)	55.0	50.0	58.0	31.0	43.0	38.0
State[3] maximum 24-hour concentration (µg/m^3)	181.0	70.0	56.0	829.0	49.0	43.0
State[3] second-highest 24-hour concentration (µg/m^3)	75.0	47.0	34.0	36.0	40.0	35.0
State annual average concentration (µg/m^3)	28.3	*	*	*	*	18.5
Number of days standard exceeded[1]						
NAAQS 24-hour (> 150 µg/m^3)[6]	0	0	0	0	0	0
CAAQS 24-hour (> 50 µg/m^3)[6]	3	1	1	1	0	0
Particulate Matter ($PM_{2.5}$)						
National[2] maximum 24-hour concentration (µg/m^3)	25.0	24.0	20.0	15.0	50.0	14.0
National[2] second-highest 24-hour concentration (µg/m^3)	20.0	13.0	16.0	14.0	13.0	10.0
State[3] maximum 24-hour concentration (µg/m^3)	25.0	24.0	20.0	15.0	50.0	14.0
State[3] second-highest 24-hour concentration (µg/m^3)	20.0	13.0	16.0	14.0	13.0	10.0
National annual designation value (µg/m^3)	8.1	*	*	*	*	*
National annual average concentration (µg/m^3)	8.0	*	7.7	*	*	*
State annual designation value (µg/m^3)	9	8	8	8	8	*
State annual average concentration (µg/m^3)[5]	8.0	*	7.8	*	*	*
Numbers of days standard exceeded[1]						
NAAQS 24-hour (> 35 µg/m^3)	0	0	0	0	1	0

Notes:
CAAQS = California Ambient Air Quality Standards.
NAAQS = National Ambient Air Quality Standards.
* = insufficient data available to determine the value.
1 An exceedance is not necessarily a violation.
2 National statistics are based on standard conditions data. In addition, national statistics are based on samplers, using federal reference or equivalent methods.
3 State statistics are based on local conditions data, except in the South Coast Air Basin; statistics there are based on standard conditions data. In addition, state statistics are based on California-approved samplers.
4 Measurements are usually collected every 6 days.
5 The state criteria for ensuring that the data are complete for calculating valid annual averages are more stringent than the national criteria.
6 Mathematical estimate of how many days concentrations would have been measured as higher than the level of the standard had each day been monitored.

Source: Air Quality Report, 2014.

Table 3.2.6-5 Ambient Monitoring Data at Victorville Station

Pollutant Standards	2007	2008	2009	2010	2011	2012
1-Hour Ozone						
Maximum 1-hour concentration (ppm)	0.107	0.109	0.111	0.111	0.098	0.111
1-hour California designation value	0.11	0.110	0.11	0.107	0.097	0.106
1-hour expected peak-day concentration	0.113	0.111	0.109	0.111	0.105	0.103
Number of days standard exceeded[1]						
CAAQS 1-hour (> 0.09 ppm)	7	16	8	6	2	6
8-Hour Ozone						
National maximum 8-hour concentration (ppm)	0.107	0.109	0.111	0.111	0.098	0.111
National second-highest 8-hour concentration (ppm)	0.101	0.106	0.110	0.107	0.097	0.106
State maximum 8-hour concentration (ppm)	0.091	0.098	0.097	0.093	0.085	0.095
State second-highest concentration (ppm)	0.089	0.096	0.096	0.088	0.083	0.090
8-hour national designation value	0.091	0.089	0.087	0.087	0.083	0.083
8-hour California designation value	0.098	0.096	0.097	0.097	0.093	0.093
8-hour expected peak-day concentration	0.101	0.097	0.097	0.097	0.094	0.093
Number of days standard exceeded[1]						
NAAQS 8-hour (> 0.075 ppm)	0	0	0	0	0	0
CAAQS 8-hour (> 0.070 ppm)	45	59	53	35	13	58
Carbon Monoxide (CO)						
National[2] maximum 8-hour concentration (ppm)	2.1	1.4	1.8	8.7	1.9	2.1
National[2] second-highest 8-hour concentration (ppm)	2.0	1.4	1.7	5.3	1.8	1.9
California[3] maximum 8-hour concentration (ppm)	1.61	1.04	1.14	5.17	1.51	1.83
California[3] second-highest 8-hour concentration (ppm)	1.50	0.91	1.07	4.26	1.50	1.52
Maximum 1-hour concentration (ppm)	2.1	1.4	1.8	8.7	1.9	2.1
Second-highest 1-hour concentration (ppm)	2.0	1.4	1.7	5.3	1.8	1.9
Number of days standard exceeded[1]						
NAAQS 8-hour (> 9.0 ppm)	0	0	0	0	0	0
CAAQS 8-hour (> 9.0 ppm)	0	0	0	0	0	0
NAAQS 1-hour (> 35 ppm)	0	0	0	0	0	0
CAAQS 1-hour (> 20 ppm)	0	0	0	0	0	0

Table 3.2.6-5 Ambient Monitoring Data at Victorville Station

Pollutant Standards	2007	2008	2009	2010	2011	2012
Particulate Matter (PM_{10})[4]						
National[2] maximum 24-hour concentration (µg/m^3)	60.0	77.0	53.0	44.0	36.0	45.0
National[2] second-highest 24-hour concentration (µg/m^3)	47.0	45.0	49.0	35.0	35.0	41.0
State[3] maximum 24-hour concentration (µg/m^3)	339.0	72.0	51.0	40.0	34.0	40.0
State[3] second-highest 24-hour concentration (µg/m^3)	126.0	69.0	34.0	33.0	40.0	33.0
State annual average concentration (µg/m^3)	35.9	*	23.9	21.8	22.1	23.3
Number of days standard exceeded[1]						
NAAQS 24-hour (> 150 µg/m^3)[6]	0	0	0	0	0	0
CAAQS 24-hour (> 50 µg/m^3)[6]	4	2	1	0	0	0
Particulate Matter ($PM_{2.5}$)						
National[2] maximum 24-hour concentration (µg/m^3)	28.0	17.0	20.0	18.0	15.0	12.0
National[2] second-highest 24-hour concentration (µg/m^3)	19.0	16.0	17.0	15.0	11.0	12.0
State[3] maximum 24-hour concentration (µg/m^3)	28.0	19.0	20.0	20.0	16.0	12.0
State[3] second-highest 24-hour concentration (µg/m^3)	20.0	17.0	17.0	16.0	12.0	12.0
National annual designation value (µg/m^3)	9.9	*	*	*	*	*
National annual average concentration (µg/m^3)	9.6	*	8.9	7.2	*	*
State annual designation value (µg/m^3)	10	10	10	9	9	8
State annual average concentration (µg/m^3)[5]	9.7	*	9.3	7.6	*	*
Numbers of days standard exceeded[1]						
NAAQS 24-hour (> 35 µg/m^3)	0	0	0	0	0	0

Notes:
CAAQS = California Ambient Air Quality Standards.
NAAQS = National Ambient Air Quality Standards.
* = insufficient data available to determine the value.
1 An exceedance is not necessarily a violation.
2 National statistics are based on standard conditions data. In addition, national statistics are based on samplers, using federal reference or equivalent methods.
3 State statistics are based on local conditions data, except in the South Coast Air Basin; statistics there are based on standard conditions data. In addition, state statistics are based on California-approved samplers.
4 Measurements are usually collected every 6 days.
5 The state criteria for ensuring that the data are complete for calculating valid annual averages are more stringent than the national criteria.
6 Mathematical estimate of how many days concentrations would have been measured as higher than the level of the standard had each day been monitored.

Source: Air Quality Report, 2014.

Mobile Sources Air Toxics

Controlling air toxic emissions became a national priority with passage of the federal CAA Amendments, whereby Congress mandated that EPA regulate 188 identified air toxics, also known as hazardous air pollutants. Mobile source air toxics (MSATs) are a subset of the 188 air toxics. The agency identified 7 compounds that have significant contributions from mobile sources (FHWA, 2006) that are among the national and regional-scale cancer risk drivers from their 1999 National Air Toxics Assessment (see the following Web site for more information: http://www.epa.gov/ttn/atw/nata1999/). The priority MSATs are acrolein, benzene, 1,3-butadiene, diesel particulate matter (DPM) plus diesel exhaust organic gases, formaldehyde, naphthalene, and polycyclic organic matter. While FHWA currently considers these to be the priority MSATs, the list is subject to change and may be adjusted in consideration of future EPA rules. Of these 7 pollutants, DPM, 1,3-butadiene, and benzene account for about 89 percent of the total toxic air pollutants responsible for potential excess cancer risk. DPM accounts for 71.2 percent of the total toxic air pollutants producing potential excess cancer risk. FHWA released interim guidance on February 3, 2006, to determine when and how to address MSAT impacts in the NEPA process for transportation projects. The guidance document was updated on December 6, 2012 (FHWA, 2012)[10]. FHWA has identified three levels of analysis:

- No analysis for exempt projects or projects with no potential for meaningful MSAT effects.
- Qualitative analysis for projects with low potential MSAT effects.
- Quantitative analysis to differentiate alternatives for projects with higher potential MSAT effects.

The HDC Project best fits into the last category. For projects warranting MSAT analysis, the seven priority MSATs should be analyzed.

Based on FHWA guidance, the HDC Project is a project with higher potential MSAT effects. This category includes projects that have the potential for meaningful differences among project alternatives. Only a limited number of projects meet this two-pronged test. To fall into this category, projects must:

- Create or significantly alter a major intermodal freight facility that has the potential to concentrate high levels of DPM in a single location; or
- Create new or add significant capacity to urban highways such as interstates, urban arterials, or urban collector-distributor routes with traffic volumes where the annual average daily traffic (AADT) is projected to be in the range of 140,000 to 150,000 or greater by the design year; and
- Be located near populated areas or in rural areas near concentrations of vulnerable populations (i.e., schools, nursing homes, hospitals).

[10] http://www.fhwa.dot.gov/environment/air_quality/air_toxics/policy_and_guidance/aqintguidmem.cfm (accessed August 11, 2014)

The HDC Project meets the second and third criteria above.

Several studies have concluded that mobile sources (i.e., on-road and non-road combined) are responsible for most of the excess cancer risk associated with exposure to urban air toxics. While much work has been done to assess the overall health risk of air toxics, many questions remain unanswered. Currently, the tools and techniques for assessing project-specific health impacts from MSATs are limited.

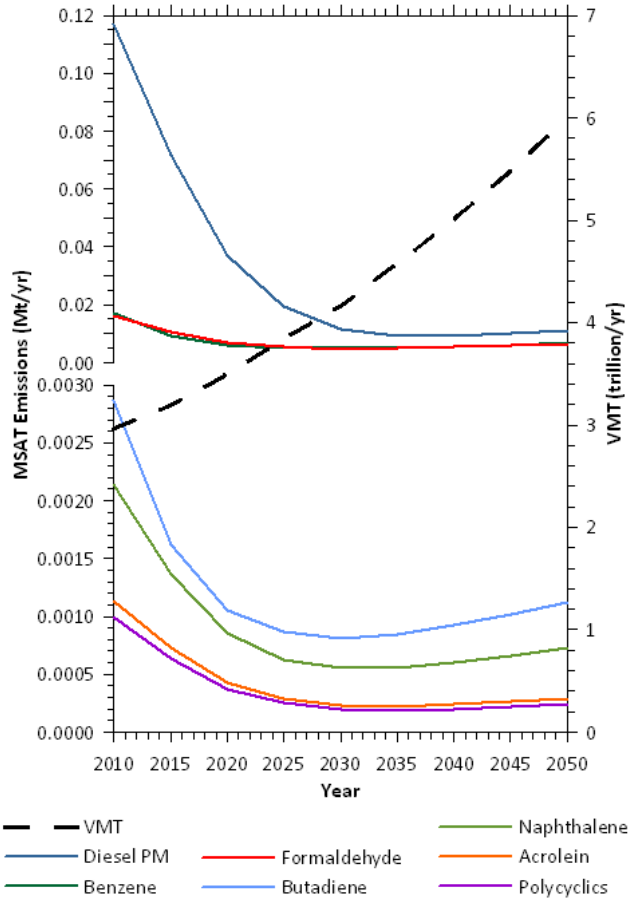
Furthermore, neither EPA nor California ARB has established regulatory concentration targets for the seven relevant MSATs for use in the project development process. For the same reason, states are not required to achieve an identified level of air toxics in the ambient air or to identify air toxics reduction measures in the SIP. Developing strategies for reducing MSATs is a cooperative effort between federal and local authorized agencies.

The federal CAA provides EPA with the authority to establish and regulate emission standards for engines and vehicles. The State of California also has certain rights to adopt its own emission regulations, which are often more stringent than the federal rules. To reduce mobile source emissions, mandatory and incentive-based programs have been developed in conjunction with new engine emission regulations; additional emission testing requirements (i.e., supplemental emission test, not-to-exceed limits); and limiting fuel sulfur content. These programs are implemented by all levels of government: federal, state, and local. Currently, FHWA's interim guidance update is used to analyze potential impacts of MSATs to be included in environmental documents.

The 2007 EPA rule requires controls that will dramatically decrease MSAT emissions through cleaner fuels and cleaner engines. According to an FHWA analysis, using EPA's MOBILE 6.2 emission factors model, even if vehicle activity (vehicle miles traveled [VMT]) increases by 102 percent as assumed, a combined reduction of 83 percent in the total annual emission rate for the priority MSATs is projected from 2010 to 2050, as shown in Figure 3.2.6-2.

Based on FHWA's tiered approach in its interim guidance document, the project would be considered to have potential effects from MSAT emissions. The following analysis provides an assessment of the project's local effects from MSAT emissions. The analysis used projected traffic data, including peak and off-peak roadway traffic volumes and VMT, fleet mix, traffic diversion data, average speed, and associated changes in air toxics emissions from project alternatives.

Figure 3.2.6-2 Projected National Mobile Source Air Toxic Emissions Trends 2010 – 2050 for Vehicles Operating on Roadways using EPA's MOVES2010b Model



Note: Trends for specific locations may be different, depending on locally derived information representing VMT, vehicle speeds, vehicle mix, fuels, emission control programs, meteorology, and other factors.
Source: EPA MOVES2010b model runs conducted during May-June 2012 by FHWA.

Information for Project-Specific Mobile Source Air Toxics Impact Analysis

Available technical tools do not enable reliable predictions of the project-specific health impacts of the emission changes associated with the alternatives in this environmental document. Due to these limitations, the following discussion is included in accordance with the Council on Environmental Quality (CEQ) regulations (40 CFR 1502.22[b]) on incomplete or unavailable information.

Incomplete or Unavailable Information

When an agency is evaluating reasonably foreseeable significant adverse effects on the human environment in an EIS and there is incomplete or unavailable information, the agency shall always make clear that such information is lacking.

a. If the incomplete information relevant to reasonably foreseeable significant adverse impacts is essential to a reasoned choice among alternatives and the overall costs of obtaining it are not exorbitant, the agency shall include the information in the environmental impact statement.

b. If the information relevant to reasonably foreseeable significant adverse impacts cannot be obtained because the overall costs of obtaining it are exorbitant or the means to obtain it are not known, the agency shall include within the EIS:

   1. A statement that such information is incomplete or unavailable;
   2. A statement of the relevance of the incomplete or unavailable information to evaluating reasonably foreseeable significant adverse impacts on the human environment;
   3. A summary of existing credible scientific evidence which is relevant to evaluating the reasonably foreseeable significant adverse impacts on the human environment; and
   4. The agency's evaluation of such impacts based upon theoretical approaches or research methods generally accepted in the scientific community. For the purposes of this section, "reasonably foreseeable" includes impacts that have catastrophic consequences, even if their probability of occurrence is low, provided that the analysis of the impacts is supported by credible scientific evidence, is not based on pure conjecture, and is within the rule of reason.

c. The amended regulation will be applicable to all EISs for which a Notice to Intent (40 CFR 1508.22) is published in the *Federal Register* on or after May 27, 1986. For EISs in progress, agencies may choose to comply with the requirements of either the original or amended regulation.

Incomplete or Unavailable Information for Project-Specific MSAT Health Impacts Analysis

In FHWA's view, 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 alternatives. 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.

The EPA is responsible for protecting the public health and welfare from any known or anticipated effect of an air pollutant. They are the lead authority for administering the CAA and its amendments and have specific statutory obligations with respect to hazardous air pollutants and MSAT. The EPA is in the continual process of assessing human health effects, exposures, and risks posed by air pollutants. They maintain the Integrated Risk Information System (IRIS), which is "a compilation of electronic reports on specific substances found in the environment and their potential to cause human health effects" (EPA, http://www.epa.gov/iris/). Each report contains assessments of non-cancerous and cancerous effects for individual compounds and

quantitative estimates of risk levels from lifetime oral and inhalation exposures with uncertainty spanning perhaps an order of magnitude.

Other organizations are also active in the research and analyses of the human health effects of MSAT, including the Health Effects Institute (HEI). Two HEI studies are summarized in Appendix D of FHWA's Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA documents. Among the adverse health effects linked to MSAT compounds at high exposures are cancer in humans in occupational settings; cancer in animals; and irritation to the respiratory tract, including the exacerbation of asthma. Less obvious is the adverse human health effects of MSAT compounds at current environmental concentrations (HEI, http://pubs.healtheffects.org/view.php?id=282) or in the future as vehicle emissions substantially decrease (HEI, http://pubs.healtheffects.org/view.php?id=306).

The methodologies for forecasting health impacts include emissions modeling; dispersion modeling; exposure modeling; and then final determination of health impacts – each step in the process building on the model predictions obtained in the previous step. All are encumbered by technical shortcomings or uncertain science that prevents a more complete differentiation of the MSAT health impacts among a set of project alternatives. These difficulties are magnified for lifetime (i.e., 70-year) assessments, particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over that time frame, since such information is unavailable.

It is particularly difficult to reliably forecast 70-year lifetime MSAT concentrations and exposure near roadways; to determine the portion of time that people are actually exposed at a specific location; and to establish the extent attributable to a proposed action, especially given that some of the information needed is unavailable.

There are considerable uncertainties associated with the existing estimates of toxicity of the various MSAT, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population, a concern expressed by HEI (http://pubs.healtheffects.org/view.php?id=282). As a result, there is no national consensus on air dose-response values assumed to protect the public health and welfare for MSAT compounds, and in particular for DPM. The EPA (http://www.epa.gov/risk/basicinformation.htm#g) and the HEI (http://pubs.healtheffects.org/getfile.php?u=395) have not established a basis for quantitative risk assessment of DPM in ambient settings.

There is also the lack of a national consensus on an acceptable level of risk. The current context is the process used by the EPA as provided by the CAA to determine whether more stringent controls are required in order to provide an ample margin of safety to protect public health or to prevent an adverse environmental effect for industrial sources subject to the maximum achievable control technology standards, such as benzene emissions from refineries. The decision framework is a two-step process. The first step requires EPA to determine an "acceptable" level of risk due to emissions from a source, which is generally no greater than approximately 100 in a

million. Additional factors are considered in the second step, the goal of which is to maximize the number of people with risks less than 1 in a million due to emissions from a source. The results of this statutory two-step process do not guarantee that cancer risks from exposure to air toxics are less than 1 in a million; in some cases, the residual risk determination could result in maximum individual cancer risks that are as high as approximately 100 in a million. In a June 2008 decision, the U.S. Court of Appeals for the District of Columbia Circuit upheld EPA's approach to addressing risk in its two-step decision framework. Information is incomplete or unavailable to establish that even the largest of highway projects would result in levels of risk greater than deemed acceptable.

Because of the limitations in the methodologies for forecasting health impacts described, any predicted difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with predicting the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against project benefits, such as reducing traffic congestion, accident rates, and fatalities plus improved access for emergency response, that are better suited for quantitative analysis.

Due to the limitations cited, a discussion (reflecting any local and project-specific circumstances), should be included regarding incomplete or unavailable information in accordance with CEQ regulations [40 CFR 1502.22(b)].

Naturally Occurring Asbestos

Asbestos is a term used for several types of naturally occurring fibrous minerals that are a human health hazard when airborne. The most common type of asbestos is chrysotile, but other types such as tremolite and actinolite are also found in California. Asbestos is classified as a known human carcinogen by state, federal, and international agencies and was identified as a toxic air contaminant by the CARB in 1986. All types of asbestos are hazardous and may cause lung disease and cancer. Asbestos can be released from serpentinite and ultramafic rocks when the rock is broken or crushed. At the point of release, the asbestos fibers may become airborne, causing air quality and human health hazards. These rocks have been commonly used for unpaved gravel roads, landscaping, fill projects and other improvement projects in some localities. Asbestos may be released to the atmosphere due to vehicular traffic on unpaved roads, during grading for development projects, and at quarry operations. All of these activities may have the effect of releasing potentially harmful asbestos into the air. Natural weathering and erosion processes can act on asbestos bearing rock and make it easier for asbestos fibers to become airborne if such rock is disturbed. Serpentinite may contain chrysotile asbestos, especially near fault zones. Ultramafic rock, a rock closely related to serpentinite, may also contain asbestos minerals. Asbestos can also be associated with other rock types in California, though much less frequently than serpentinite and/or ultramafic rock. Serpentinite and/or ultramafic rock are known to be present in 44 of California's 58 counties. These rocks are particularly abundant in the counties of the Sierra Nevada foothills, the Klamath Mountains, and Coast Ranges. The California Department of Conservation, Division of Mines and Geology have developed a map of the state

showing the general location of ultramafic rock in the state. Los Angeles County is one of the Counties identified as one of the Counties containing serpentinite and ultramafic rock. However, only the Catalina Island portion of Los Angeles County has been found to contain such rock; hence, it is not anticipated to be found in the project area.

Other Asbestos Containing Materials

The use of asbestos in many building products was banned by the EPA by the late 1970s. Those already in use when the ban was implemented may still be present in bridge joints or in structural materials. ACMs represent a concern when they are subject to damage that results in the release of fibers. Asbestos may be found in roadway materials such as rails, bearing pads, support piers, expansion joint material in bridges, asphalt, and concrete within the study area.

Sensitive Receptors

Figures 3.2.6-3 through 3.2.6-14 show the sensitive receptors in the proposed project area.

Figure 3.2.6-3 Sensitive Receptors, Part 1 (Within 500 ft. & 0.25 mile of Project Corridor)

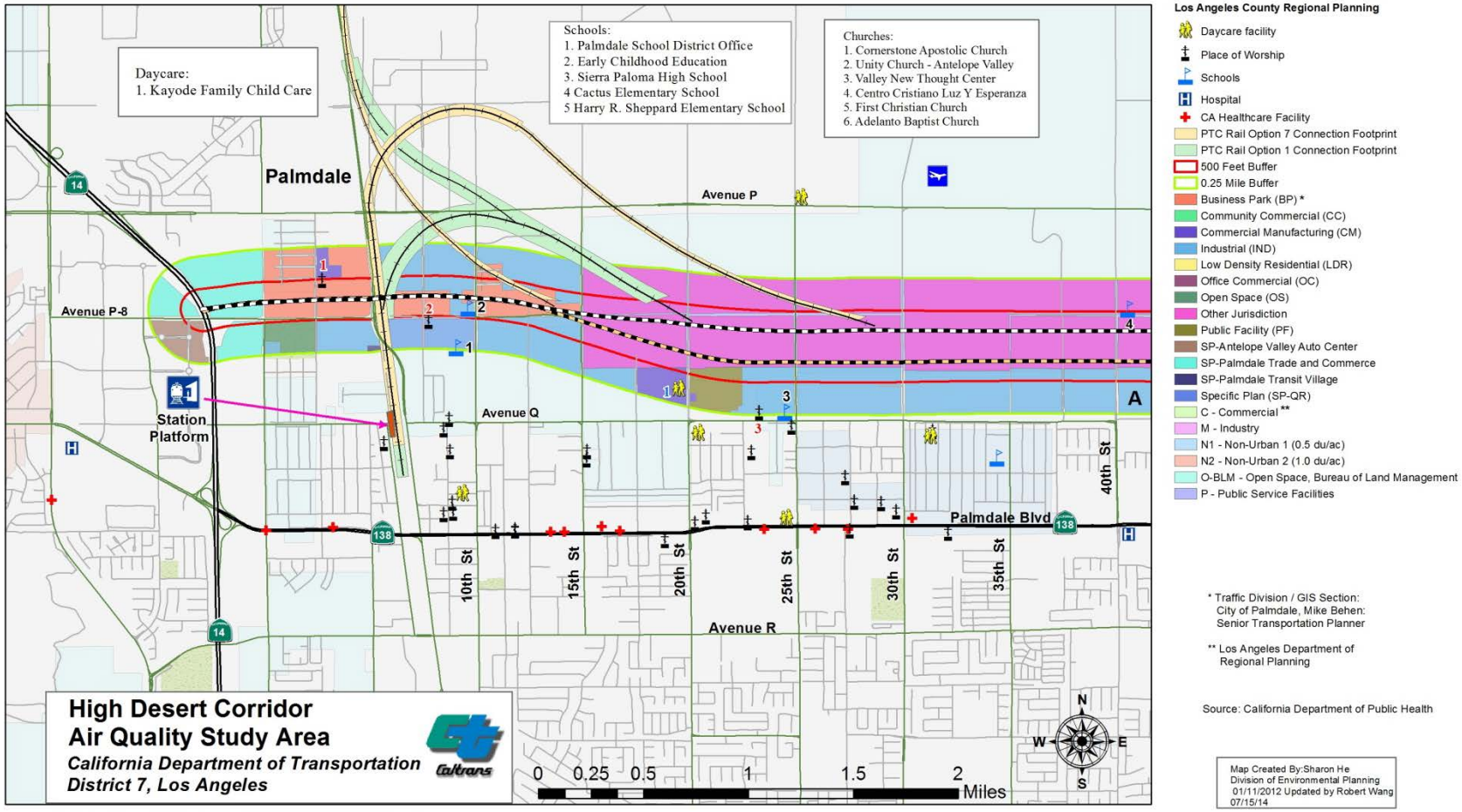


Figure 3.2.6-4 Sensitive Receptors, Part 2 (Within 500 ft. & 0.25 mile of Project Corridor)

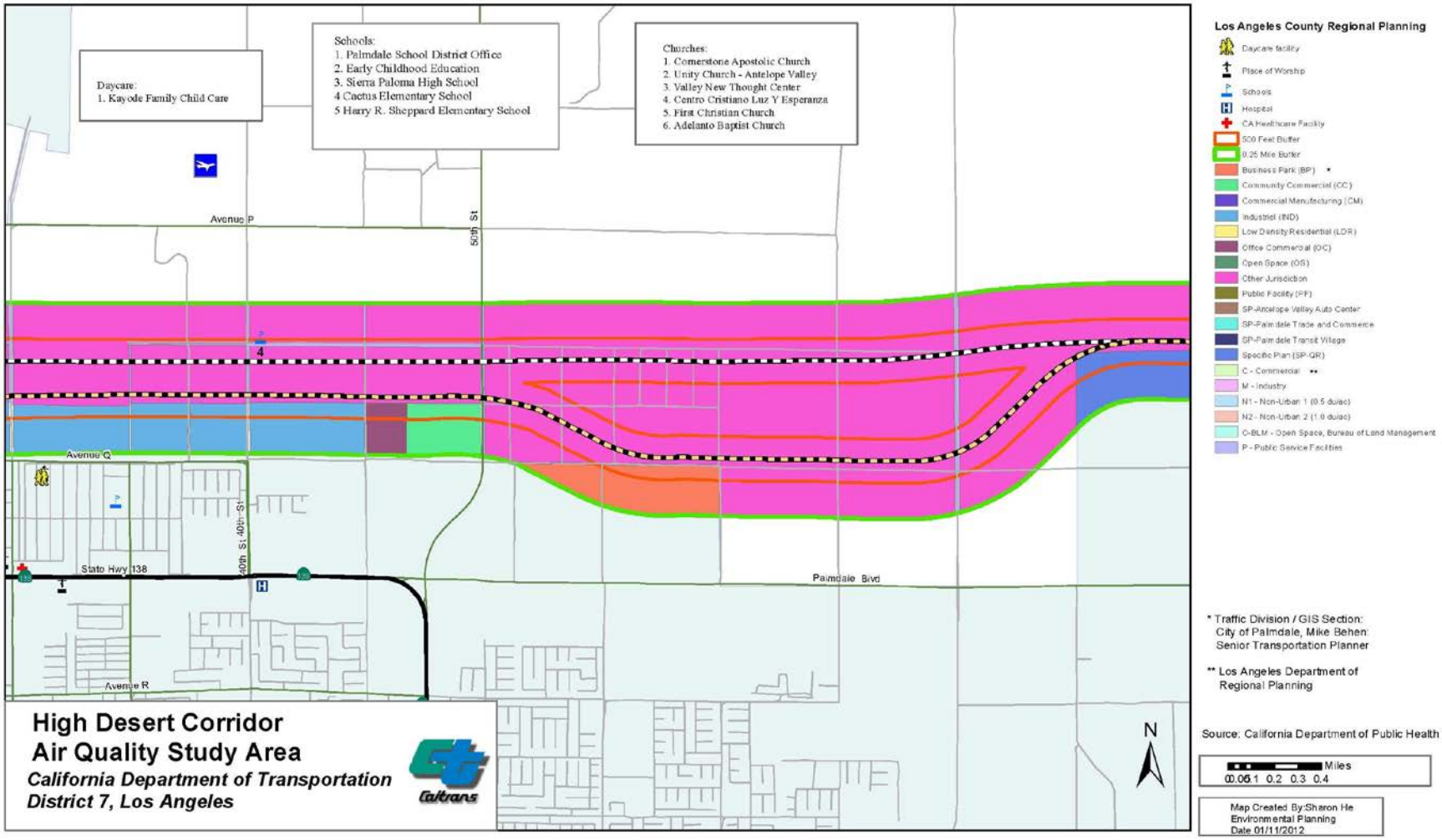


Figure 3.2.6-5 Sensitive Receptors, Part 3 (Within 500 ft. & 0.25 mile of Project Corridor)

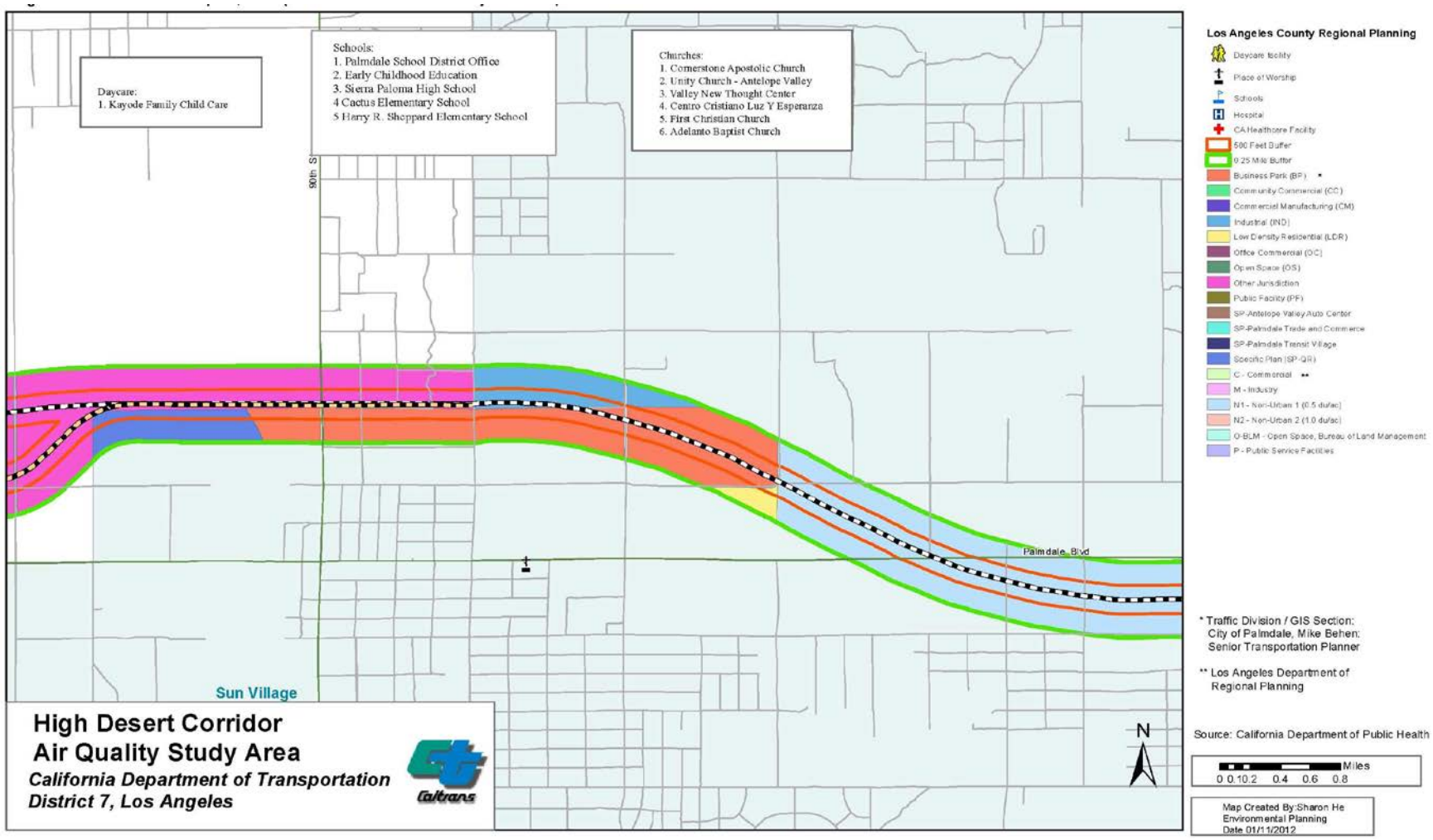


Figure 3.2.6-6 Sensitive Receptors, Part 4 (Within 500 ft. & 0.25 mile of Project Corridor)

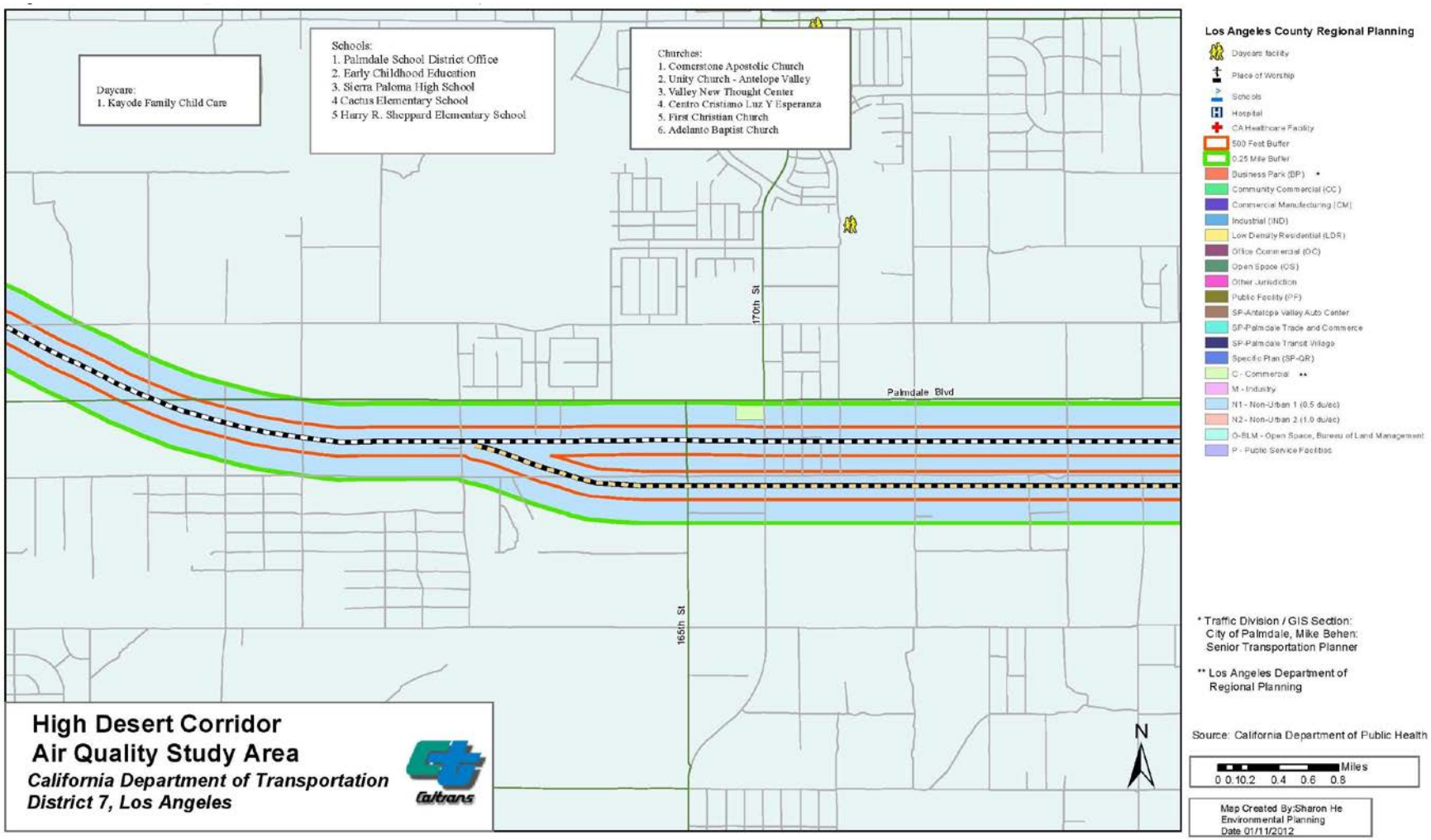


Figure 3.2.6-7 Sensitive Receptors, Part 5 (Within 500 ft. & 0.25 mile of Project Corridor)

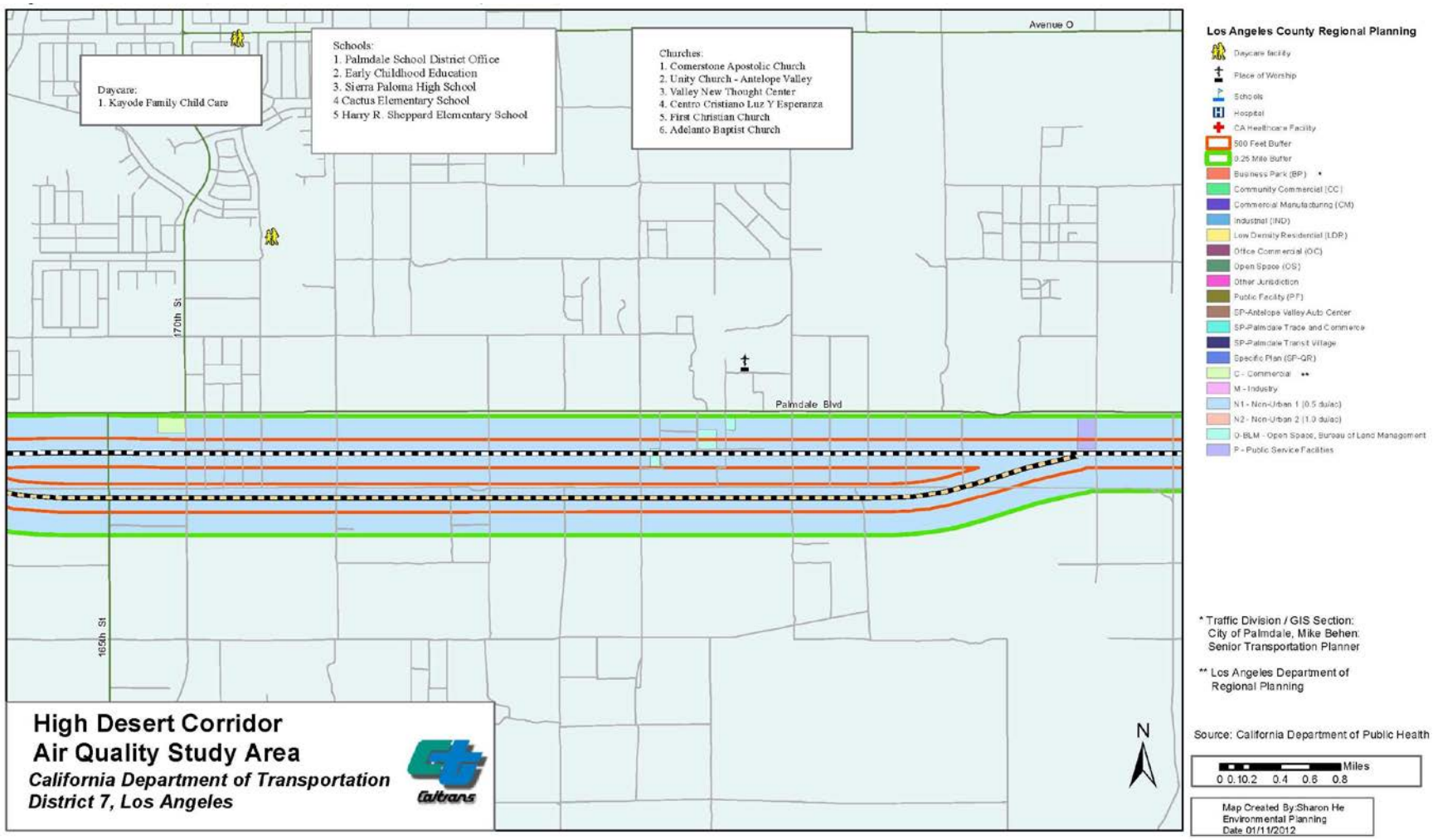


Figure 3.2.6-8 Sensitive Receptors, Part 6 (Within 500 ft. & 0.25 mile of Project Corridor)

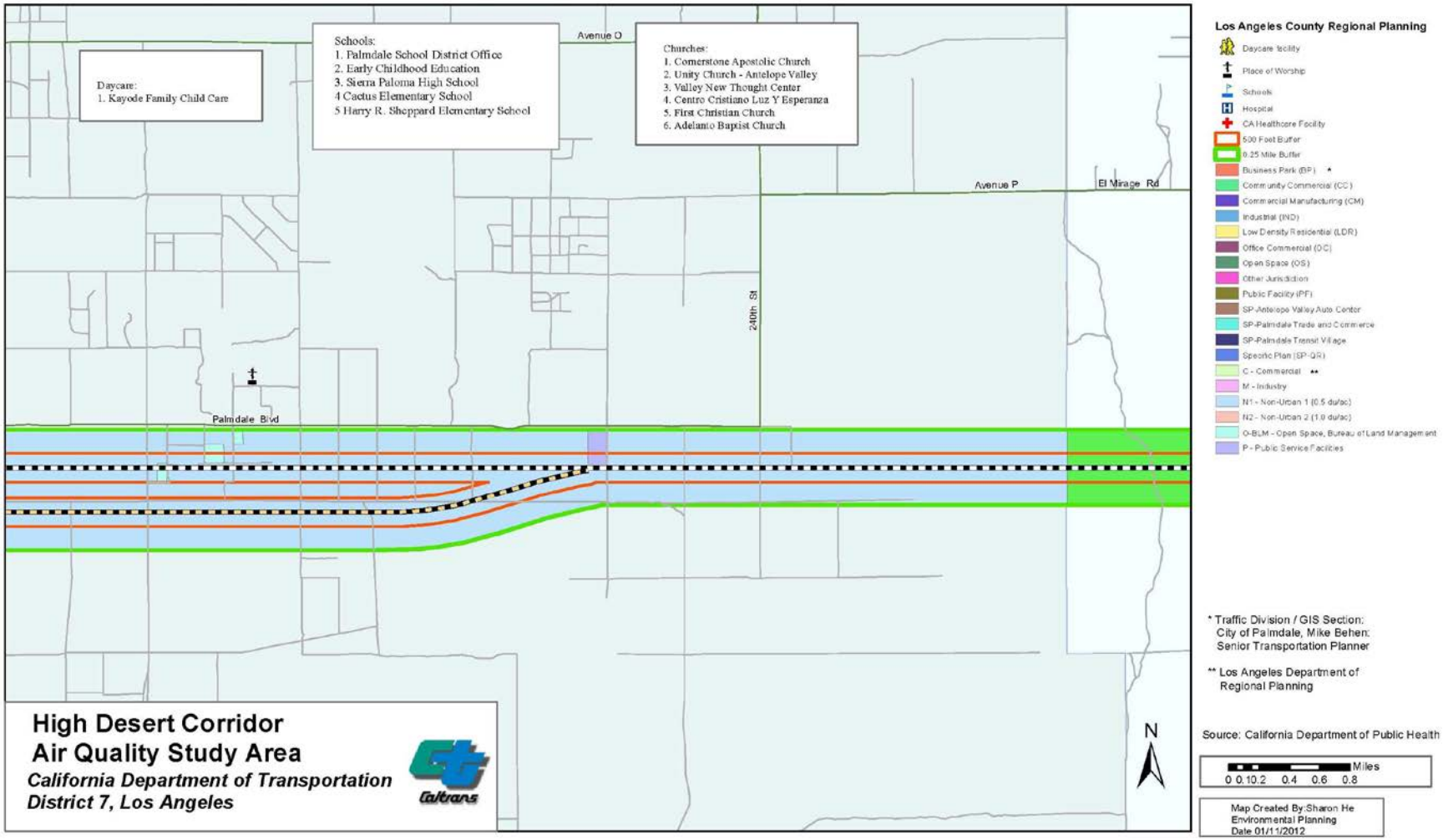


Figure 3.2.6-9 Sensitive Receptors, Part 7 (Within 500 ft. & 0.25 mile of Project Corridor)

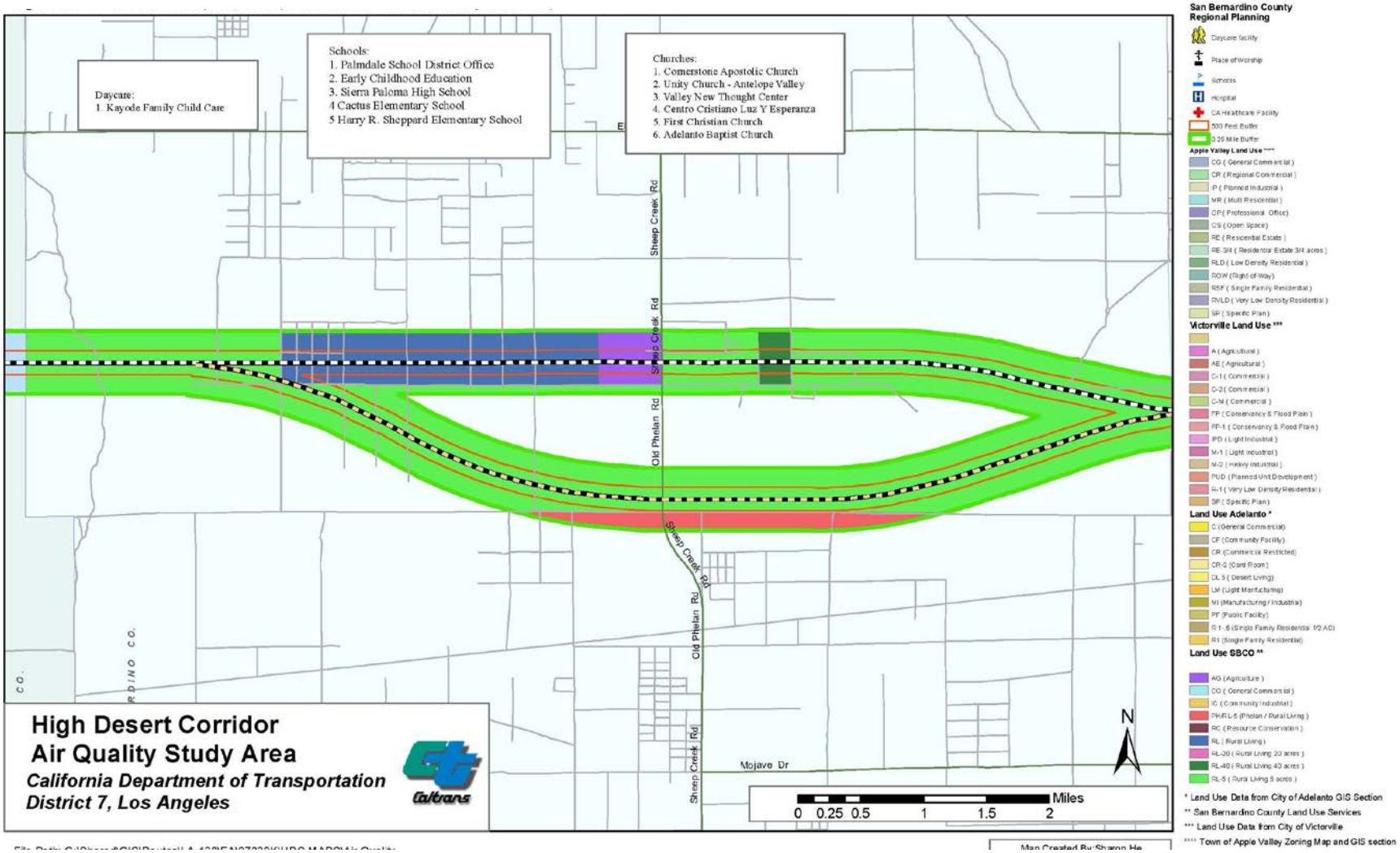


Figure 3.2.6-10 Sensitive Receptors, Part 8 (Within 500 ft. & 0.25 mile of Project Corridor)

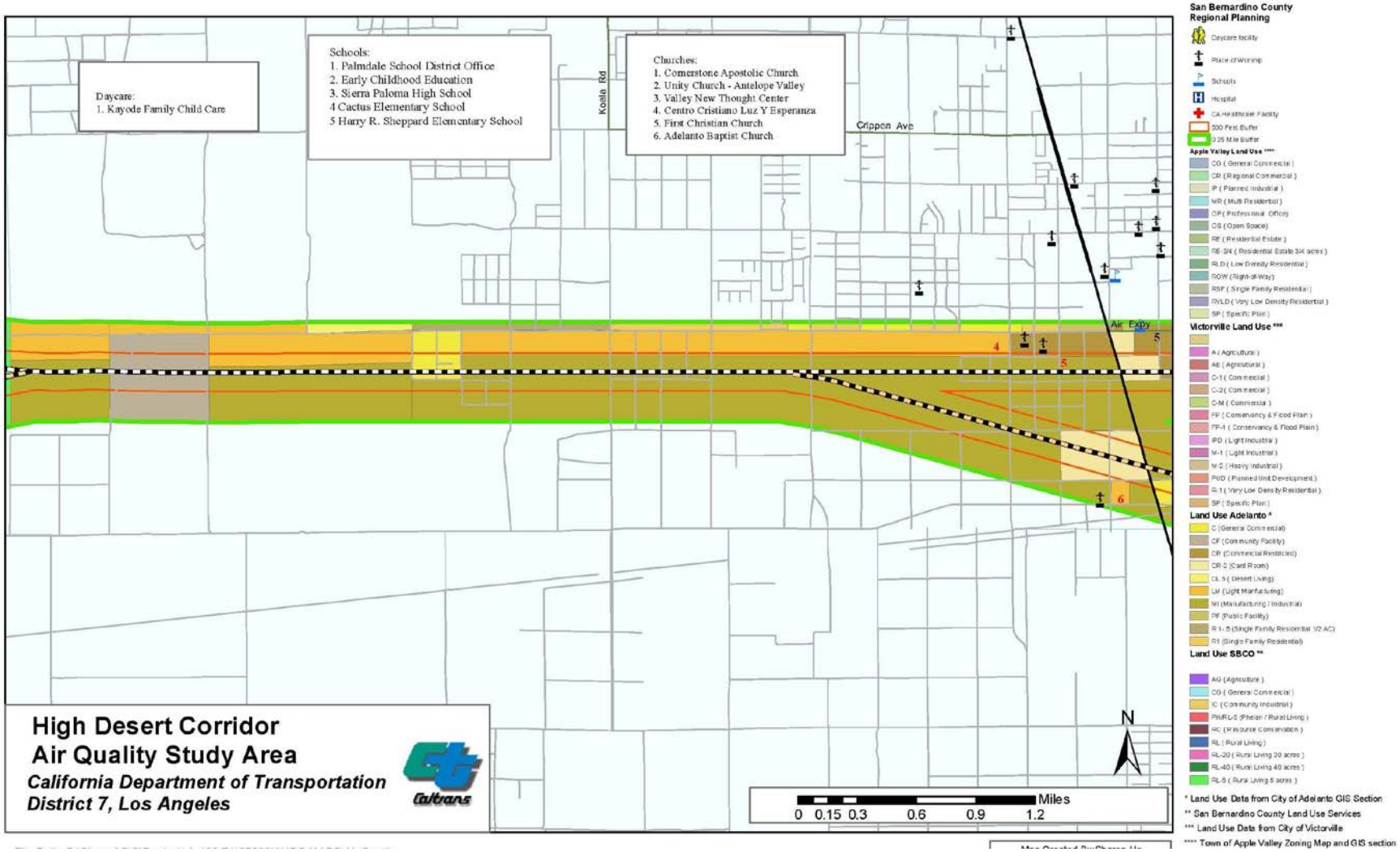


Figure 3.2.6-11 Sensitive Receptors, Part 9 (Within 500 ft. & 0.25 mile of Project Corridor)

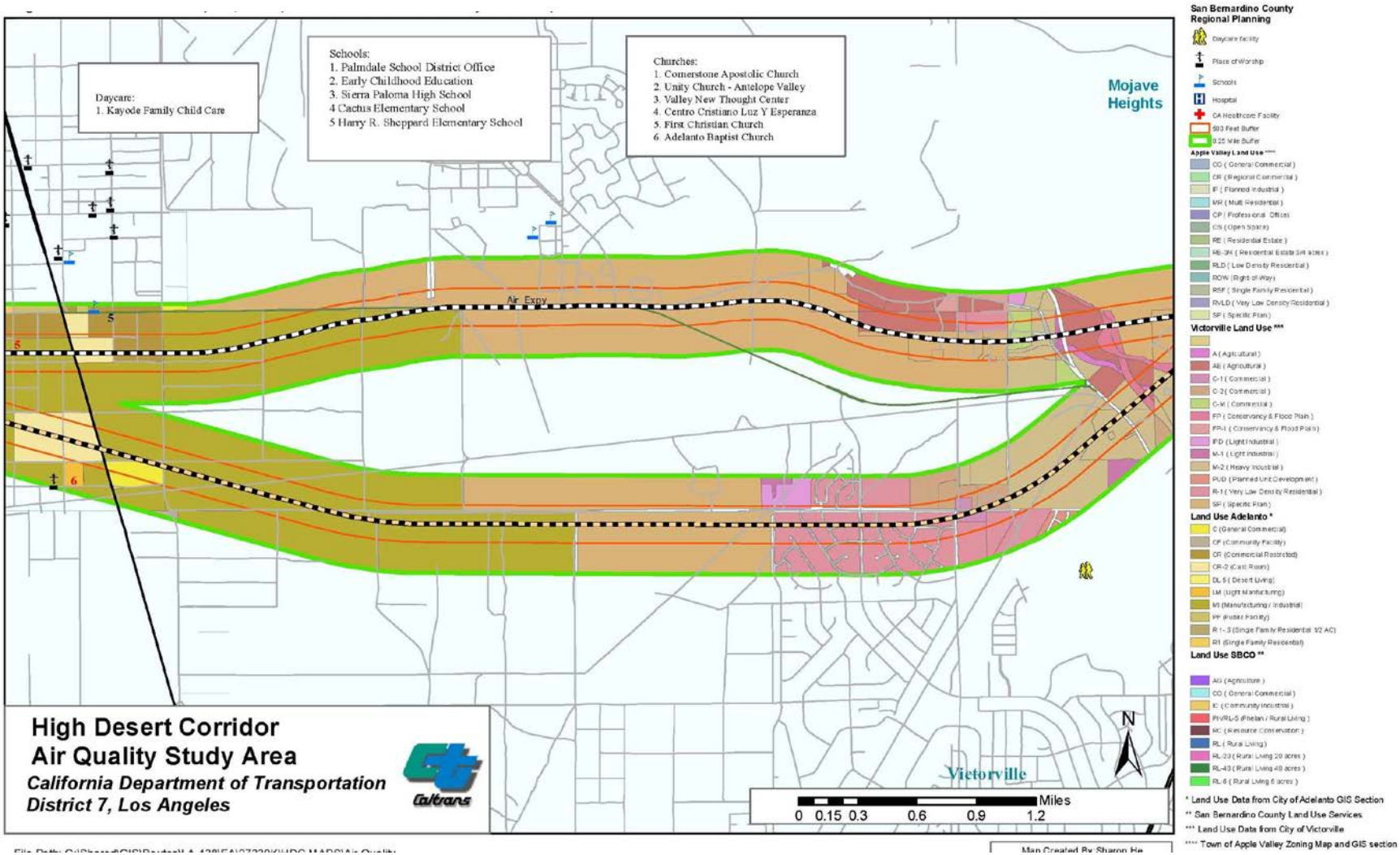


Figure 3.2.6-12 Sensitive Receptors, Part 10 (Within 500 ft. & 0.25 mile of Project Corridor)

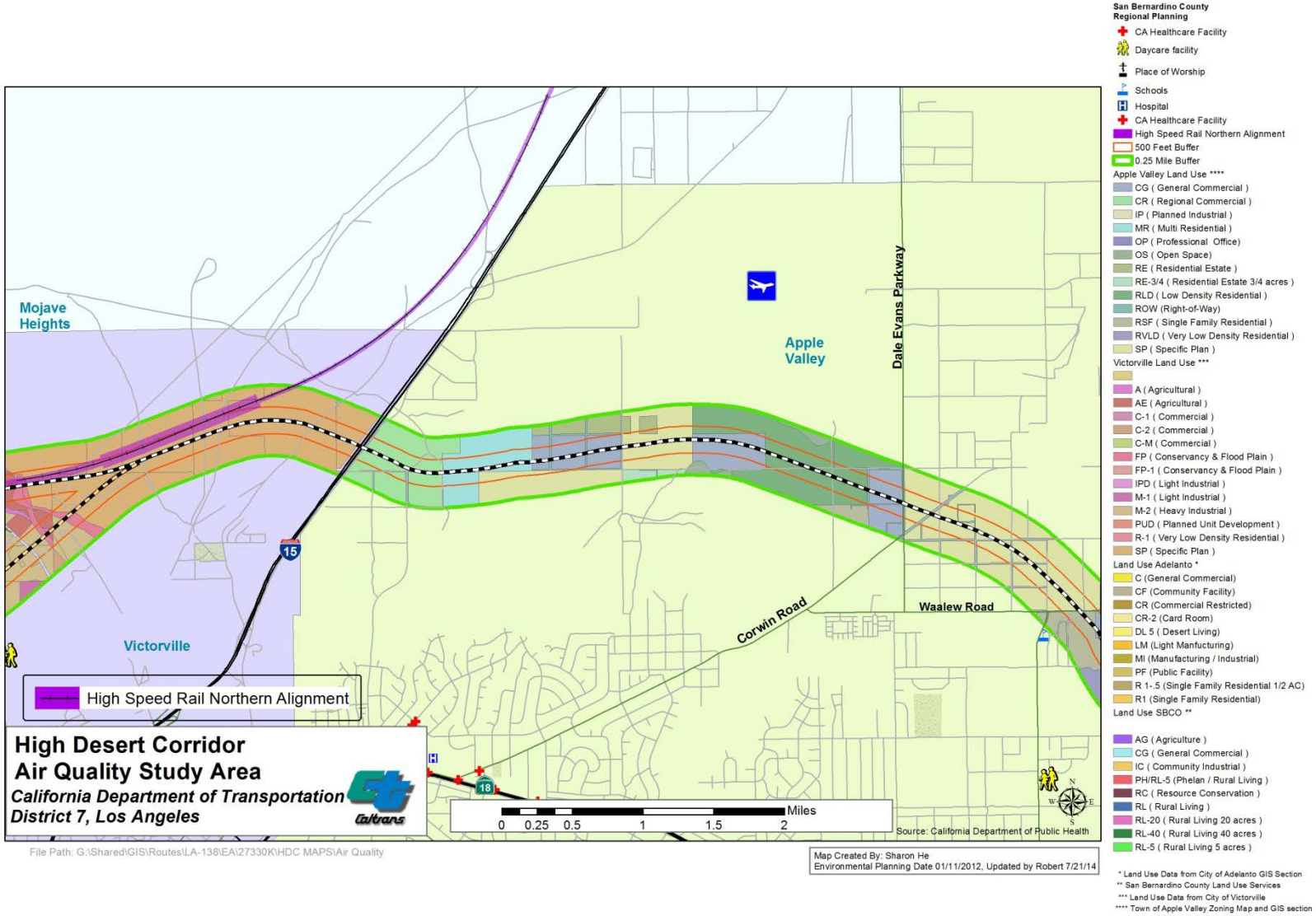


Figure 3.2.6-13 Sensitive Receptors, Part 11 (Within 500 ft. & 0.25 mile of Project Corridor)

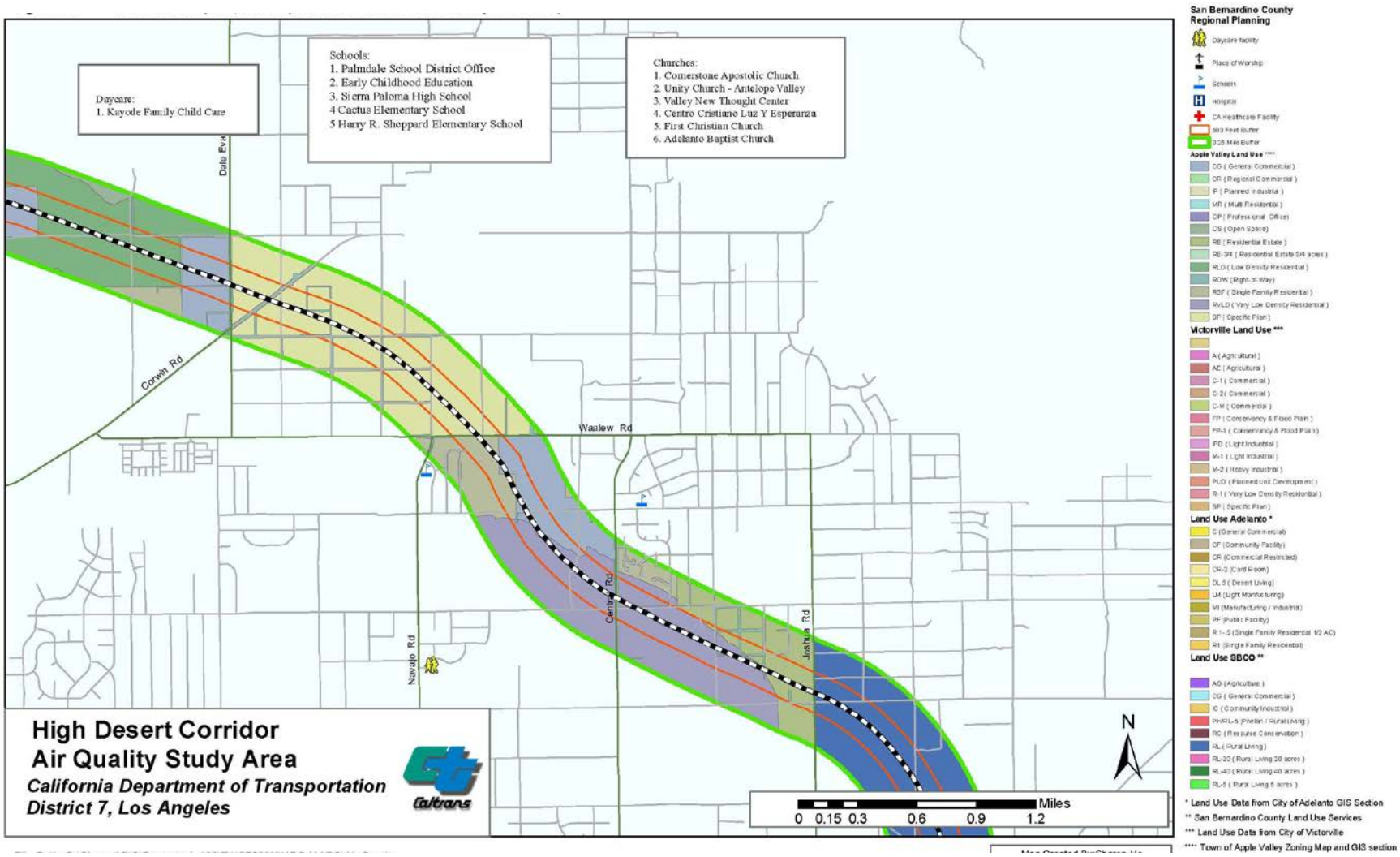
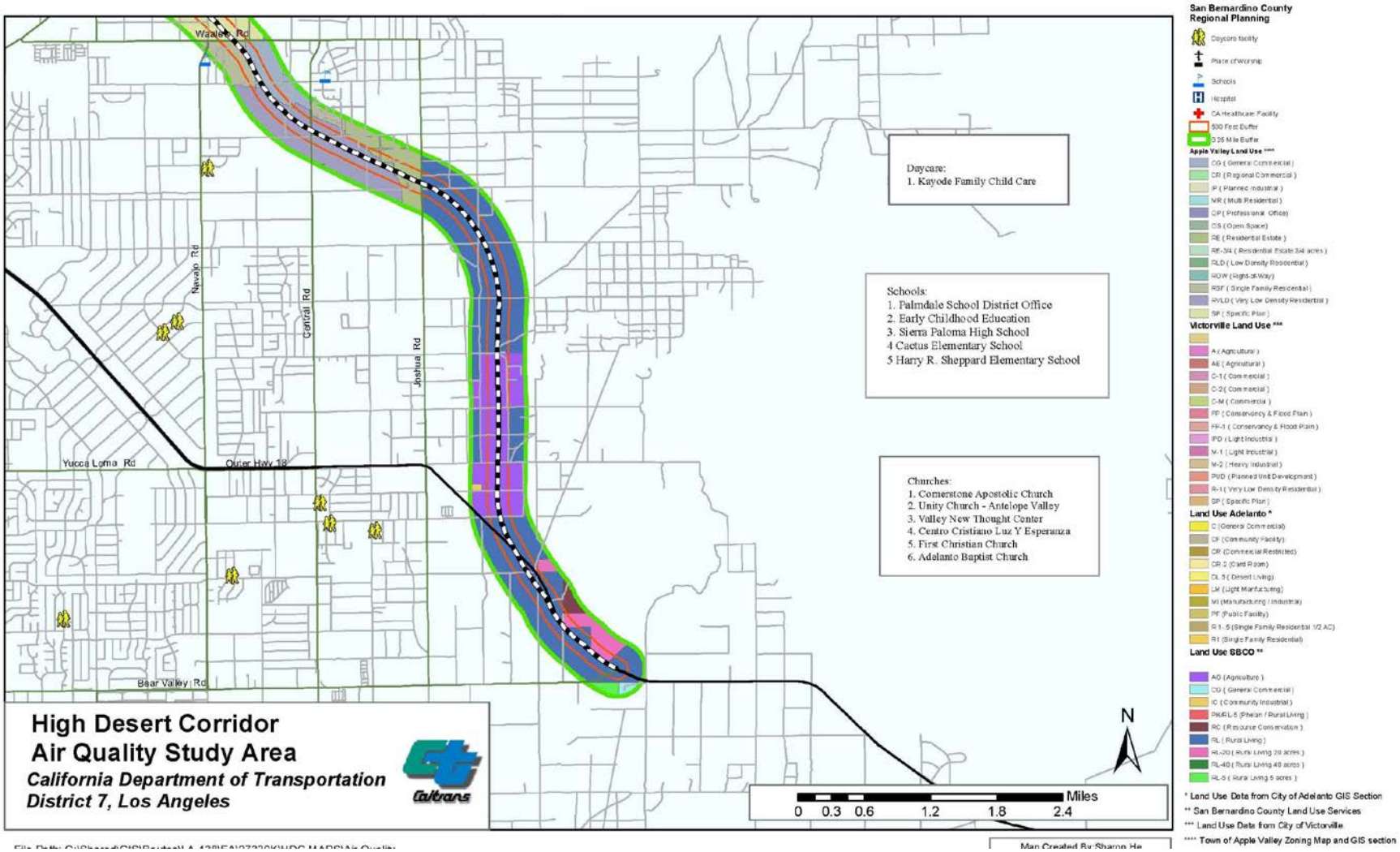


Figure 3.2.6-14 Sensitive Receptors, Part 12 (Within 500 ft. & 0.25 mile of Project Corridor)



Environmental Consequences

This section discusses long-term impacts on air quality in terms of regional air quality conformity and project-level conformity. Temporary impacts associated with construction of the project are addressed in Section 3.6, Construction Impacts.

No Build Alternative

The No Build Alternative would not make any project improvements; therefore, no analysis of improvements would be required. However, this alternative would potentially be inconsistent with regional plans and programs such as the 2012 RTP/SCS and 2013 FTIP since the project would not be constructed as approved in the Regional Transportation Plan for the area.

Common to All Build Alternatives

Regional Air Quality Conformity

In determining whether a project conforms to an approved air quality plan, agencies must use current emission estimates based on the most recent population, employment, travel, and congestion estimates determined by SCAG. As the MPO for the region, SCAG is required to develop and maintain long-range plans and programs, such as 20-year RTP and 4-year (or longer) Regional Transportation Improvement Program (RTIP) that set out transportation policies and programs for the region. A conforming RTIP model projects that the regulated pollutants will be reduced to acceptable levels within time frames that meet the NAAQS.

The proposed project is listed in the 2012 financially constrained RTP Amendment No. 1, which was found to conform by SCAG on April 4, 2012, and FHWA and FTA made a regional conformity determination finding on June 4, 2012. The project is also included in SCAG's financially constrained 2013 FTIP No. 13-15, page 10 for Los Angeles County and page 8 for San Bernardino County. The SCAG 2013 FTIP was determined to conform by FHWA and FTA on December 18, 2013. The design concept and scope of the proposed project is consistent with the project description in the 2012 RTP, 2013 FTIP, and the "open to traffic" assumptions of SCAG's regional emissions analysis.

Project-Level Conformity

The MDAB within the project area is federally designated as a nonattainment area for the following standards: 8-hour O_3 for both AVAQMD and MDAQMD areas, and 24-hour PM_{10} for MDAQMD area only. The basin is designated as an attainment area for federal and state CO standards. A project-level transportation conformity determination is required for the project for those criteria pollutants that are currently in nonattainment of the federal standards. Project-level transportation conformity is thus demonstrated with a PM_{10} hot-spot analysis.

To meet conformity requirements, a project-level hot-spot analysis is required under EPA's Transportation Conformity Rule for projects of local air quality concern. Section 40 CFR 93.123(b)(1) of the Transportation Conformity Rule defines types of

projects that are considered projects of local air quality concern, including the following:

- New or expanded highway projects that have a significant number of or significant increase in diesel vehicles.
- Projects affecting intersections that are at level of service (LOS) D, E, or F with a significant number of diesel vehicles, or those that will change to LOS D, E, or F because of increased traffic volumes from a significant number of diesel vehicles related to the project.

The HDC Project falls within the category of new or expanded highway projects with a significant number of diesel vehicles; therefore, the project would be considered as a project of local air quality concern. Based on the current and forecast traffic data, the new HDC is projected to experience a significant increase in diesel vehicles and to carry a significant number of diesel vehicles. The project is therefore considered to be of air quality concern as described in 40 CFR 93.123 (b)(l)(i) and requires a detailed conformity hot-spot analysis.

Discussion of Results from Carbon Monoxide Hot-Spot Analysis Common to all Build Alternatives

Localized CO impacts from the project build alternatives were evaluated following the 1997 Caltrans guidance document titled Transportation Project-Level Carbon Monoxide Protocol. A quantitative hot-spot analysis was done at two intersections that would have the highest traffic volume and the worst peak-hour LOS according to the Air Quality Report (August 2014). The intersections were selected based on their travel activity data.

Localized concentrations of CO were estimated for the year 2040 using the CALINE4 dispersion model (developed by Caltrans), in conjunction with emission factors from the California ARB emission factor model EMFAC2011.

Background CO concentrations were taken from the Lancaster/Palmdale Station (#046624) and Victorville Station (#049325) maintained by the Western Regional Climate Center. The Lancaster/Palmdale Station is located approximately 1.3 miles east of SR-14 and approximately 5 miles north of the proposed HDC alignment. The Victorville Station is located approximately 0.2 mile west of I-15 and 0.25 mile north SR-18. Because the air basin is in attainment for CO standards, using the average ambient concentrations during the past 3 years at these monitoring stations are appropriate for background concentrations for future years, as well as the existing condition.

Results of localized CO analysis are shown in Table 3.2.6-6. According to the results in Table 3.2.6-6, the proposed project build alternatives would result in concentrations less than the federal and State standards and would not create violations of the standards at the project intersections in which the worst-case CO impacts are anticipated within the project area in Los Angeles and San Bernardino counties.

As Table 3.2.6-6 shows, the project build alternatives would not have a considerable impact on 8-hour local CO concentrations at the intersections with the highest traffic volumes. No substantial adverse effect is expected to occur at any other locations in the study area. The project would not contribute to a violation of standards, and project-level CO conformity would be satisfied.

Table 3.2.6-6 8-Hour CO Concentrations for Build Condition

Intersection	Distance from Edge of Travel Way (Meters)		8-Hour CO Concentration (Modeled + Background in ppm)	8-Hour Exceeds Standards?	
				State	Federal
10th Street West and West Avenue P in Los Angeles County	Receptor 1	3	1.4	No	No
	Receptor 2	3	1.6	No	No
	Receptor 3	3	1.6	No	No
	Receptor 4	3	1.4	No	No
SR-18 and Armargosa Road in San Bernardino County	Receptor 1	3	4.6	No	No
	Receptor 2	3	4.7	No	No
	Receptor 3	3	4.6	No	No
	Receptor 4	3	4.8	No	No
Ambient 8-hour standards: State = 9.0 ppm; Federal = 9 ppm					

Source: Air Quality Report 2014

Particulate Matter Conformity Hot-Spot Analysis and General Discussion of Results from Modeling

EPA's Transportation Conformity Rule (40 CFR Parts 51.390 and Part 93, March 2012) addresses local air quality impacts in particulate matter (PM_{10} and $PM_{2.5}$) federal nonattainment and maintenance areas. The rule provides criteria and procedures to ensure that any such project will not cause or contribute to new violations, increase the frequency or severity of any existing violations, or delay the timely attainment of the relevant NAAQS as described in 40 CFR Part 93.101. In March 2006, EPA issued a guidance document with a methodology for qualitative particulate matter analysis. The qualitative analysis is required effective March 10, 2006. The qualitative analysis requires analysis based on EPA's Transportation Conformity Guidance for Qualitative Hot-Spot Analyses in Particulate Matter ($PM_{2.5}$ and PM_{10}) Nonattainment and Maintenance Areas.

<u>Methodology</u>

Hot-spot analyses were conducted in accordance with EPA's Transportation Conformity Guidance for Quantitative Hot-Spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas (EPA Guidance, November 2013).

This quantitative particulate matter hot-spot analysis was prepared based on the build alternative that comprises of the most complete set of proposed project features, including the toll program and rail system, to demonstrate conformity; and furthermore, emissions of $PM_{2.5}$ and PM_{10} were estimated for all alternatives based on

the forecast travel activity data and emission factors generated from the latest EPA-approved emissions model, EMFAC2011. The demonstration of conformity requirements would be updated after the preferred alternative is selected. While emissions analysis for all alternatives is discussed separately, the results of the conformity hot-spot analysis, as well as quantitative analysis, are provided below.

While the American Meteorological Society/EPA Regulatory Model (AERMOD) is the EPA's recommended model, Section 3.2 of Appendix W to 40 CFR Part 51 provides applicable guidance with which an EPA's Regional Office may determine the acceptability of alternative models such as some commercial Graphical User Interface (GUI) versions of AERMOD. The quantitative analysis for the proposed project was prepared using the AERMOD View Message Passing Interface by Lakes Environmental (Lakes AERMOD View MPI). Prior to the use of the Lakes AERMOD View MPI, Caltrans coordinated with EPA Region 9 Office and Model Clearinghouse and satisfactorily demonstrated that the Lakes AERMOD View MPI produced concentration estimates equivalent to those obtained using EPA's standard AERMOD for all types of sources typically used in dispersion modeling and those used in the hot-spot analysis.

According to the conformity rules and regulations, nonattainment and maintenance areas are required to attain and maintain applicable NAAQS. San Bernardino County is in nonattainment of the 24-hour PM_{10} NAAQS, while both Los Angeles and San Bernardino counties are in attainment of 24-hour $PM_{2.5}$ and annual $PM_{2.5}$ NAAQS. The Antelope Valley portion of Los Angeles County in which the proposed project area is located is in attainment of the 24-hour PM_{10} NAAQS. A hot-spot analysis to demonstrate conformity to the 24-hour PM_{10} NAAQS was thus prepared under a separate cover for the portion of the proposed project in San Bernardino County and was submitted to the interagency consultation for their review and concurrence. The interagency consultation within the SCAG area is conducted as the Transportation Conformity Working Group (TCWG). As noted in Section 5.3, TCWG is comprised of agencies including SCAG, Caltrans, EPA, FHWA, air districts, ARB, and regional transportation agencies that are involved with maintaining conformity and improving air quality in southern California.

TCWG reviewed and provided comments in April 2014. The hot-spot analysis was revised to address the comments and submitted to the TCWG in May 2014; and it was concurred with by the TCWG in June 2014. Appendix F of the Air Quality Report provides a Quantitative PM_{10} Hot-Spot Analysis as submitted to and concurred with by the TCWG in June 2014. As indicated in Appendix F of the Air Quality Report, the conformity requirement has been demonstrated, and the project is deemed acceptable for circulation to the public.

In addition to the demonstration of conformity requirement for the 24-hour PM_{10} NAAQS, design concentrations (or Design Value) of 24-hour $PM_{2.5}$ and annual $PM_{2.5}$ were calculated at hot-spot locations in San Bernardino and Los Angeles counties, as shown in Tables 3.2.6-7 and 3.2.6-8.

Table 3.2.6-7 Design Values at Hot-Spot Locations in Los Angeles and San Bernardino Counties in 2020

Project Area	24-Hour PM_{10} ($\mu g/m^3$)	24-Hour $PM_{2.5}$ ($\mu g/m^3$)	Annual $PM_{2.5}$ ($\mu g/m^3$)
Los Angeles County	70	32	9.0
San Bernardino County	80	26	12.7

Source: Air Quality Report 2014

Table 3.2.6-8 Design Values at Hot-Spot Locations in Los Angeles and San Bernardino Counties in 2040

Project Area	24-Hour PM_{10} ($\mu g/m^3$)	24-Hour $PM_{2.5}$ ($\mu g/m^3$)	Annual $PM_{2.5}$ ($\mu g/m^3$)
Los Angeles County	70	33	9.6
San Bernardino County	90	28	13.5

Source: Air Quality Report 2014

The AERMOD estimates ground-level concentrations at a series of receptors placed in the model. For this hot-spot analysis, a line of receptors was placed at the right-of-way (ROW) line, and layers of receptors were placed subsequently at every 10 meters up to 50 meters from the ROW line; and at 50 meters up to 250 meters from the ROW line. All receptors were placed around a hot-spot location in Los Angeles and San Bernardino counties, each identified from model runs of the entire corridor with FASTALL option. The location and spacing of receptor placement for the hot-spot analysis was determined according to the EPA Guidance.

The EPA Guidance notes that design values are a fundamental component of particulate matter analyses because they are the values compared to applicable NAAQS. In general, a design value is a statistic that describes a future air quality concentration in the project area and is calculated by combining modeled concentrations and monitored background concentrations. Background concentrations at Lancaster/Palmdale and Victorville are summarized in Table 3.2.6-9 and were used in calculating design values (presented earlier in Tables 3.2.6-7 and 3.2.6-8) for portions of the project in Los Angeles and San Bernardino counties, respectively.

The design values in Tables 3.2.6-7 and 3.2.6-8 are based on the multiple model runs and indicate that the proposed project will not likely create new or worsen existing violations of the 24-hour PM_{10} NAAQS or 24-hour $PM_{2.5}$ NAAQS. While the results indicate that the highest design values for annual $PM_{2.5}$ are higher than the NAAQS and CAAQS in the San Bernardino County portion of the proposed project, these design values occur at receptors located in unpopulated areas along the ROW line (1 meter away from the fence line) and would not be considered appropriate “area-wide” locations representative of neighborhood, urban, and regional scales, as well as micro- or middle-scale monitors defined in 40 CFR 58.1. All other appropriate receptors modeled within the vicinity of the identified hot-spot resulted in levels below the NAAQS and CAAQS for the annual $PM_{2.5}$.

Table 3.2.6-9 Background Concentrations at Lancaster/Palmdale and Victorville

Monitoring Station	24-Hour PM_{10} ($\mu g/m^3$)	24-Hour $PM_{2.5}$ ($\mu g/m^3$)*	Annual $PM_{2.5}$ ($\mu g/m^3$)*
Lancaster/Palmdale	51	27	6.9
Victorville	45	14	7.0**
NAAQS	150	35	12.0
CAAQS	50	No Separate CAAQS	12

* 24-Hour and Annual $PM_{2.5}$ background concentrations at Lancaster/Palmdale were calculated based on 3-year measurements between 2009 and 2011 due to unavailability of 3rd quarter measurements in 2012.
** Victorville has two monitors at the site, and the highest background concentration is noted.

Source: HDC Air Quality Report 2014.

The proposed project build alternatives, however, will likely cause violations of the State 24-hour PM_{10} standard in both counties. Federal and State requirements are anticipated to help further reduce PM_{10} emissions in the future by essentially lowering per-vehicle emissions for each of the diesel vehicles.

As concurred with by the TCWG (see Appendix K), the project has demonstrated the project-level conformity requirements for the criteria pollutant that is in nonattainment (24-hour PM_{10}) as defined in 40 CFR Sections 93.116 and 93.123.

Conformity Determination

As mentioned earlier, the proposed project build alternatives is contained in the approved RTP and included in the regional emissions analysis that was used to meet regional conformity. Based on the above analysis results, this project will not delay timely attainment of the particulate matter (PM_{10} or $PM_{2.5}$) NAAQS for the MDAB area. Activities of this project should, therefore, be considered consistent with the purpose of the SIP, and it should be determined that the project build alternatives conforms to the requirements of the federal CAA.

Naturally Occurring Asbestos

As indicated in the Affected Environmental section, Los Angeles County is one of the Counties identified as one of the Counties containing serpentinite and ultramafic rock, but only the Catalina Island portion of Los Angeles County has been found to contain such rock; hence, it is not anticipated to be found in the project area. Therefore, no potential impacts from naturally occurring asbestos during project construction would occur.

Other Asbestos Containing Materials

Impacts from ACMs are addressed in Section 3.2.5, Hazardous Waste or Materials.

Construction Impacts

Please refer to Section 3.6 for discussion of construction impacts related to air quality.

Mobile Source Air Toxics

Although an emissions analysis cannot identify and measure health impacts from MSATs, it can provide a basis for identifying and comparing the potential differences in MSAT emissions from various alternatives and between various project milestone years.

Regional and Corridor MSAT Emissions Analysis

MSAT emissions analysis for the proposed project was performed using the CT-EMFAC (v5.0). While the MDAB was selected as the geographic area, emission factors were drawn from the inventory according to the counties in which each respective analysis area is located to evaluate its representative conditions. For the purpose of this emissions analysis, an area covering approximately 606 square miles along and surrounding the proposed HDC was evaluated, roughly bounded to the west by SR-14, to the east by SR-18, to the south by SR-138, and to the north by I-15. To provide evaluation of localized MSAT emissions, the area was divided into individual mile-by-mile squares, totaling up to 606 squares. Traffic data were analyzed in and forecasted for each of the squares; and emissions were estimated for each square based on the individual set of forecast traffic data. Figure 3.2.6-15 illustrates the extent of the area considered in this MSAT emissions analysis, and it provides a key map for locations that correspond to the grid numbers in the MSAT summary tables in Appendix G of the Air Quality Report.

In addition to the regional emissions of MSAT covering 606 mile-by-mile squares, daily emissions of DPM and benzene were also estimated for each segment along the proposed corridor. These corridor emissions have been estimated based on the corridor-level VMTs forecasted with 4 periods of a day: AM period is identified as the time period when the roadway is congested from 6:00 AM to 9:00 AM in the morning; PM period is the congested time period in the afternoon from 3:00 PM to 7:00 PM; Mid-Day is identified between the AM and PM peak periods from 9:00 AM to 3:00 PM; and Night period is defined from 7:00 PM to 6:00 AM.

Discussion of Results

The MSAT emissions were estimated for the current year conditions as well as for the No-Build and all Build Alternatives in the future years of 2020 (opening year) and 2040 (build-out year). Results of the No-Build Alternative were compared to those of the Build Alternatives in the future years of 2020 and 2040 (Table 3.2.6-10). Results of the MSAT emissions for the future years were also compared to those for the existing year. Summaries of the comparison are provided in a Table below with differences compared between each respective Build Alternative and the No-Build or between Alternative in the future years and the existing conditions.

The summary of regional emissions indicates that reduction in regional MSAT emissions is anticipated with all of the build alternatives when compared to the existing conditions; however, when compared to the No Build Alternative in each respective year, all of the build alternatives are anticipated to result in an increase in all MSAT emissions. As depicted in Appendices G and H, however, future MSAT emissions in 2020 and 2040 result in a decrease in many areas outside the immediate

vicinity along the proposed HDC corridor, while most of the increased emissions are anticipated along the proposed HDC corridor.

Table 3.2.6-10 Comparison of MSAT Emissions for Project Alternatives – Opening Year 2020 and Horizon Year 2040

	Summary of VMT Used for GHG Calculation (Mile)*	MOBILE SOURCE AIR TOXICS EMISSIONS (LBS/DAY)							
		Benzene	Acrolein	Formalde-hyde	Butadiene	Naphtha-lene	POM	DPM	DEOG
Base Year, 2010	7,722,930	107.8	5.4	134.2	24.1	5.3	1.9	288.8	392.0
Opening Year, 2020									
No-Build	10,071,438	42.2	2.0	65.5	8.9	3.4	0.9	99.0	267.1
Change from Base Year		*-65.6*	*-3.4*	*-68.7*	*-15.2*	*-1.9*	*-1.0*	*-189.8*	*-124.9*
Fwy/Exp or Fwy/Exp with HSR	12,369,704	51.5	2.4	76.9	11.0	3.9	1.1	137.5	301.4
Change from Base Year		*-56.3*	*-2.9*	*-57.3*	*-13.1*	*-1.4*	*-0.8*	*-151.3*	*-90.6*
Change from No-Build		*9.3*	*0.5*	*11.5*	*2.1*	*0.5*	*0.2*	*38.5*	*34.2*
Fwy/Toll or Fwy/Toll with HSR	11,736,991	49.1	2.4	70.7	10.5	3.8	1.0	120.0	267.2
Change from Base Year		*-58.8*	*-3.0*	*-63.5*	*-13.6*	*-1.6*	*-0.9*	*-168.7*	*-124.8*
Change from No-Build		*6.9*	*0.4*	*5.2*	*1.6*	*0.3*	*0.1*	*21.0*	*0.0*
Horizon Year, 2040									
No-Build	13,666,032	38.0	1.8	60.9	8.0	5.1	1.1	96.8	253.8
Change from Base Year		*-69.8*	*-3.6*	*-73.3*	*-16.1*	*-0.2*	*-0.8*	*-191.9*	*-138.2*
Fwy/Exp or Fwy/Exp with HSR	17,012,874	46.9	2.2	71.0	10.0	5.7	1.3	130.0	279.1
Change from Base Year		*-60.9*	*-3.2*	*-63.2*	*-14.1*	*0.4*	*-0.6*	*-158.8*	*-112.9*
Change from No-Build		*9.0*	*0.5*	*10.1*	*2.0*	*0.6*	*0.2*	*33.1*	*25.3*
Fwy/Toll or Fwy/Toll with HSR	16,234,481	45.0	2.2	66.5	9.6	5.6	1.3	118.9	255.3
Change from Base Year		*-62.8*	*-3.2*	*-67.7*	*-14.5*	*0.2*	*-0.7*	*-169.9*	*-136.7*
Change from No-Build		*7.0*	*0.4*	*5.6*	*1.6*	*0.5*	*0.2*	*22.0*	*1.6*

Note: * VMT presented here is a summary of VMT within the 606 mile-by-mile square grid. Speed at each grid varies depending on type of roadway and traffic volume. Note also that these VMT data were provided by the traffic analysis team for use as input to the GHG calculations.

Source: HDC Air Quality Report, 2014.

The emissions of benzene and DPM were also estimated for each segment only along the proposed HDC based on the corridor-level VMT data and are summarized in Table 3.2.6-11. It should be noted that the corridor-level emissions are provided only for the build alternatives.

Figure 3.2.6-15 Analysis Area for MSAT and Key Map

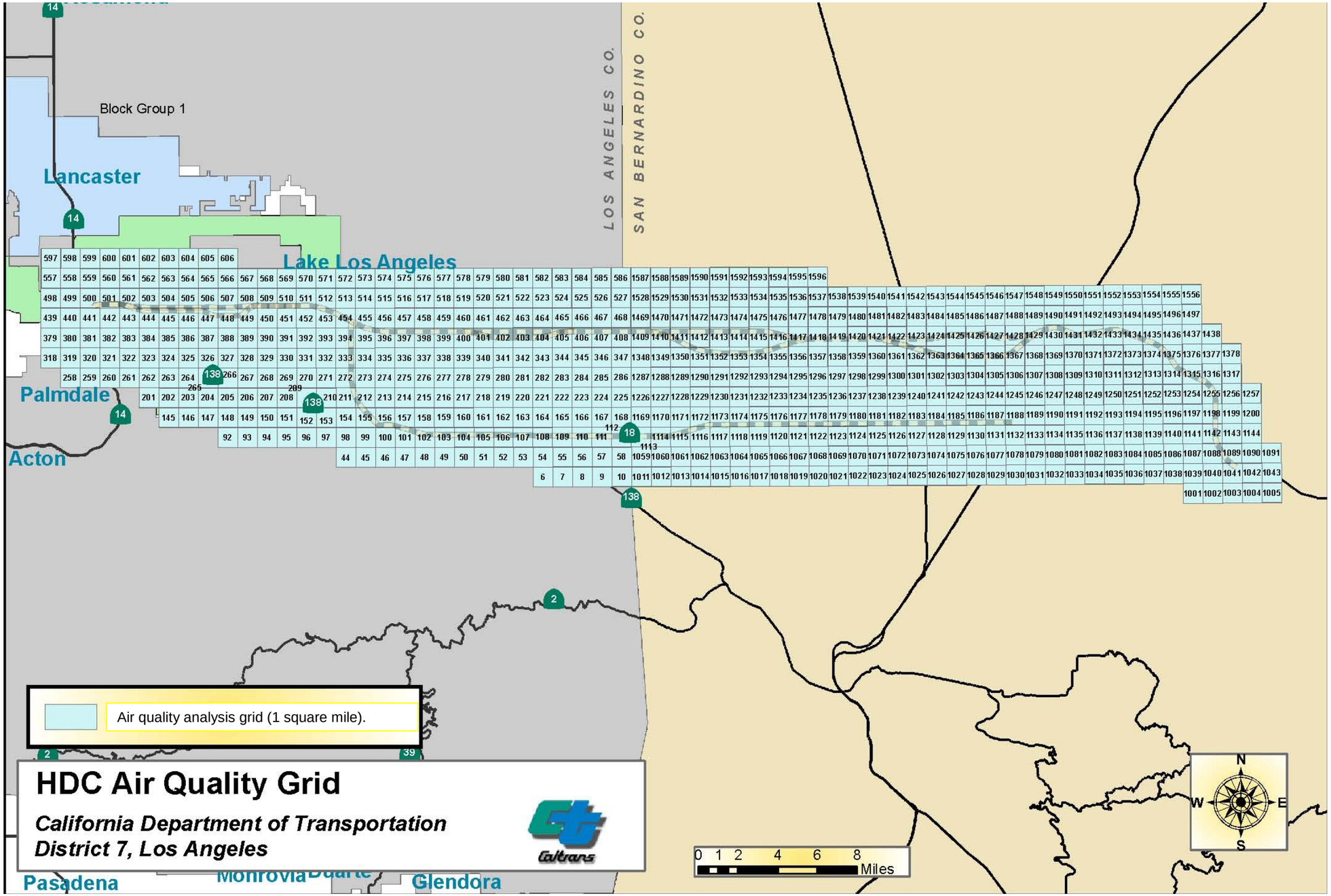


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Table 3.2.6-11 Summary of Corridor-Level MSAT Emissions

	Summary of VMT Used for GHG Calculation (Mile)*	Mobile Source Air Toxics Emissions (lbs/day)	
		Benzene	DPM
Opening Year, 2020**			
Fwy/Exp or Fwy/Exp with HSR	4,305,895	16.4	56.0
Fwy/Toll or Fwy/Toll with HSR	6,892,708	12.5	36.6
Horizon Year, 2040			
Fwy/Exp or Fwy/Exp with HSR	5,991,701	15.8	53.8
Fwy/Toll or Fwy/Toll with HSR	8,303,004	12.5	42.5

Note: * VMT presented here is a summary of VMT at four different time periods of the day. Speed at eachtime period varies depending on traffic volume. Note also that these VMT data were provided by the traffic analysis team for use as input to the GHG calculations.

** Data for Base Year and No Build are not available because there was no corridor in 2010 (Base Year) and there would be no corridor to project the No Build condition.

Source: HDC Air Quality Report, 2014.

The ARB's "Air Quality and Land Use Handbook" identifies the following land uses as particularly sensitive to MSATs: residential areas, schools, hospitals and other health care facilities, day care and other child care facilities, and parks and playgrounds. However, as discussed above, the magnitude and the duration of potential increases and exposure compared to the No Build Alternative cannot be accurately quantified due to the inherent deficiencies of current models. On a regional basis, EPA's and California's vehicle and fuel regulations, coupled with fleet turnover, will over time cause regionwide MSAT levels to be lower than today.

Discussion of Results from Regional and Corridor-Level PM Emissions Analysis

In a similar manner as the regional MSAT emissions, regional PM emissions were estimated for the current year conditions, as well as for the No Build Alternative and all of the build alternatives in the future years of 2020 (opening year) and 2040 (build-out year). Results of the No Build Alternative were compared to those of the build alternatives in the future years of 2020 and 2040. Results of the PM emissions for the future years were also compared to those for the existing year. Summaries of the comparison in regional PM emissions are provided in Table 3.2.6-12.

The summary indicates that the regional PM emissions are anticipated to increase with all of the alternatives when compared to the existing conditions, except for the $PM_{2.5}$ emissions for the No Build Alternative in 2020. When compared to the No Build Alternative in each respective year, all of the build alternatives are anticipated to result in an increase in all PM emissions. When evaluated based on the grid areas, in greater detail, future PM emissions in 2020 and 2040 result in a decrease in many areas outside the immediate vicinity along the proposed HDC, while most of the increased emissions are anticipated along the proposed HDC corridor.

Table 3.2.6-12 Comparison of PM Emissions for Project Alternatives – Opening Year 2020 and Horizon Year 2040

	Particulate Matter (lbs/day)	
	PM_{10}	**$PM_{2.5}$**
Base Year, 2010	1,186.7	649.4
Opening Year, 2020		
No-Build	1,249.4	565.5
Change from Base Year	*62.7*	*-83.9*
Fwy/Exp or Fwy/Exp with HSR	1,552.0	707.9
Change from Base Year	*365.3*	*58.5*
Change from No-Build	*302.6*	*142.4*
Fwy/Toll or Fwy/Toll with HSR	1,455.1	659.9
Change from Base Year	*268.4*	*10.6*
Change from No-Build	*205.7*	*94.5*
Horizon Year, 2040		
No-Build	1,642.8	730.5
Change from Base Year	*456.1*	*81.1*
Fwy/Exp or Fwy/Exp with HSR	2,049.6	912.5
Change from Base Year	*862.9*	*263.2*
Change from No-Build	*406.8*	*182.0*
Fwy/Toll or Fwy/Toll with HSR	1,946.1	864.9
Change from Base Year	*759.4*	*215.6*
Change from No-Build	*303.3*	*134.5*

Source: HDC Air Quality Study, 2014

The emissions of PM_{10} and $PM_{2.5}$ were also estimated for each segment along the proposed corridor based on the corridor-level VMT data. Table 3.2.6-13 summarizes total corridor-level emissions for the build alternatives. It should be noted that these corridor emissions include fugitive dust emissions as they were included as part of the demonstration for project-level conformity. Furthermore, alternatives with the proposed HSR feeder service should consider approximately 1.74 pounds per mile of PM_{10} emissions per day to account for wind-driven fugitive dust from operation of the rail service. Likewise, approximately 0.26 pounds per mile per day should be added for $PM_{2.5}$ emissions.

Table 3.2.6-13 Summary of Corridor-Level PM Emissions

	Particulate Matter Emissions (lbs/day)	
	PM_{10}	$PM_{2.5}$
Opening Year, 2020		
Fwy/Exp or Fwy/Exp with HSR	1,703.9	534.7
Fwy/Toll or Fwy/Toll with HSR	1,158.8	365.9
Horizon Year, 2040		
Fwy/Exp or Fwy/Exp with HSR	2,197.6	688.5
Fwy/Toll or Fwy/Toll with HSR	1,654.3	520.1
Note: The summary includes fugitive dust emissions from vehicular traffic along the proposed corridor only.		

Source: HDC Air Quality Study, 2014.

Discussion of Regional and Corridor-Level Organic Gases and CO Emissions Results

In a similar manner with estimates of PM, CO_2, and MSATs, regional emissions were estimated for reactive organic gases (ROG), total organic gases (TOG), nitrogen oxides (NO_x), and CO and are summarized in Table 3.2.6-14.

Table 3.2.6-14 Summary of Emissions of Regional Pollutants

	Emissions of Other Pollutants (lbs/day)			
	ROG	TOG	CO	NO_X
Base Year, 2010	3,285.6	3,990.1	74,536.1	16,737.3
Opening Year, 2020				
No-Build	1,418.3	1,837.9	37,671.5	8,145.5
Change from Base Year	*-1,867.3*	*-2,152.1*	*-36,864.6*	*-8,591.8*
Fwy/Exp or Fwy/Exp with HSR	1,726.4	2,211.6	44,493.3	10,641.8
Change from Base Year	*-1,559.1*	*-1,778.4*	*-30,042.8*	*-6,095.5*
Change from No-Build	*308.2*	*373.7*	*6,821.8*	*2,496.3*
Fwy/Toll or Fwy/Toll with HSR	1,639.1	2,105.3	42,671.4	9,603.3
Change from Base Year	*-1,646.5*	*-1,884.7*	*-31,864.7*	*-7,133.9*
Change from No-Build	*220.8*	*267.4*	*4,999.9*	*1,457.8*
Horizon Year, 2040				
No-Build	1,215.8	1,639.8	34,512.0	5,941.2
Change from Base Year	*-2,069.8*	*-2,350.2*	*-40,024.1*	*-10,796.1*
Fwy/Exp or Fwy/Exp with HSR	1,508.2	1,996.1	40,858.9	7,381.3
Change from Base Year	*-1,777.4*	*-1,993.9*	*-33,677.2*	*-9,356.0*
Change from No-Build	*292.4*	*356.3*	*6,346.9*	*1,440.1*
Fwy/Toll or Fwy/Toll with HSR	1,442.8	1,913.9	39,250.2	6,894.7
Change from Base Year	*-1,842.8*	*-2,076.2*	*-35,285.9*	*-9,842.6*
Change from No-Build	*227.0*	*274.1*	*4,738.2*	*953.5*

Source: HDC Air Quality Study, 2014.

Furthermore, emissions of CO were also estimated for each segment along the proposed corridor based on the corridor-level VMT data. Table 3.2.6-15 provides a summary of total corridor-level emissions for the proposed HDC build alternatives.

Table 3.2.6-15 Summary of Corridor-Level CO Emissions

	CO (lbs/day)
Opening Year, 2020	
Fwy/Exp or Fwy/Exp with HSR	12,693.6
Fwy/Toll or Fwy/Toll with HSR	9,470.4
Horizon Year, 2040	
Fwy/Exp or Fwy/Exp with HSR	12,199.1
Fwy/Toll or Fwy/Toll with HSR	9,262.7

Source: HDC Air Quality Study, 2014.

The summary indicates that the regional emissions are anticipated to decrease with all of the alternatives and for all future years when compared to the existing conditions. When compared to the No Build Alternative in each respective year, all of the build alternatives are anticipated to result in an increase in all regional emissions.

Toxic Air Contaminants

In 1998, EPA's Office of Environmental Health Hazard Assessment (OEHHA) completed a comprehensive health assessment of diesel exhaust. This assessment formed the basis for a decision by the ARB to formally identify particles in diesel exhaust as a TAC that may pose a threat to human health.

TACs consist of a variety of compounds, including metals, minerals, soot, and hydrocarbon-based chemicals. There are hundreds of different types of air toxics, with varying degrees of toxicity. Sources of TACs include industrial processes, such as petroleum refining and chrome-plating operations; commercial operations, such as gasoline stations and dry cleaners; and motor vehicle exhaust. TACs are a concern in the basin because of the large number of mobile sources and industrial facilities throughout the basin. Toxicity of TACs is studied by the OEHHA.

California regulates TACs through its Air Toxics Program, which is mandated in Chapter 3.5 of the Health and Safety Code – *Toxic Air Contaminants*, and Part 6 – *Air Toxics Hot Spots Information and Assessment* (H&SC Sections 39660 *et seq*. and 44300 *et seq*., respectively).

The regulatory approach used in controlling TAC levels relies on a quantitative risk assessment process rather than ambient air conditions to determine allowable emission levels from the source. In addition, for carcinogenic air pollutants, there is no safe concentration in the atmosphere. Local concentrations can pose a health risk and are termed "toxic hot spots."

The ARB has adopted a Diesel Risk Reduction Plan (DRRP) with control measures that would reduce the overall DPM emissions by about 85 percent from 2000 to 2020. In addition, total toxic risk from diesel exhaust may only be exposed for a much shorter duration. Furthermore, DPM is only one of many environmental toxics, and those of other toxics and other pollutants in various environmental media may over shadow its cancer risks. Thus, while diesel exhaust may pose potential cancer risks to receptors spending time on or near high-risk DPM facilities, most receptors' short-term exposure would only cause minimal harm, and these risks would also greatly diminish in the future operating years of the project due to planned emission control regulations.

Climate Change

Climate change is analyzed in Chapter 4. Neither EPA nor FHWA has issued explicit guidance or methods to conduct project-level greenhouse gas (GHG) analysis. As stated on FHWA's climate change Website (http://www.fhwa.dot.gov/hep/climate/index.htm), climate change considerations should be integrated throughout the transportation decision-making process – from planning through project development and delivery. Addressing climate change mitigation and adaptation up front in the planning process will aid decision making and improve efficiency at the program level, and it will inform the analysis and stewardship needs of project-level decision making. Climate change considerations can easily be integrated into many planning factors, such as supporting economic vitality and global efficiency, increasing safety and mobility, enhancing the environment, promoting energy conservation, and improving the quality of life.

Because there have been more requirements set forth in California legislation and executive orders on climate change, the issue is addressed in the CEQA chapter of this environmental document and may be used to inform the NEPA decision. The four strategies set forth by FHWA to lessen climate change impacts correlate with efforts that the State has undertaken and is undertaking to deal with transportation and climate change; the strategies include improved transportation system efficiency, cleaner fuels, cleaner vehicles, and reduction in the growth of vehicle hours traveled.

Avoidance, Minimization, and/or Mitigation Measures

Standard conditions to minimize short-term air quality impacts, including MSAT, are noted in Section 3.6, Construction Impacts.

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