4.2 Air Quality

4.2.1 Introduction

The air quality analysis conducted for the SPAS alternatives addresses criteria pollutant emissions from operational activities (on-site stationary sources, on-site mobile sources, and off-site regional traffic) that would occur at buildout in the horizon year of 2025. The analysis also addresses emissions from construction activities (e.g., on-site and off-site construction equipment, fugitive dust, and worker vehicle trips) that would occur during the temporary construction periods assumed to occur between 2015 and 2025 for each alternative. The analysis of SPAS-related emissions includes a comparison to the air pollutant emissions associated with baseline (2009) conditions. Potential impacts related to greenhouse gas and human health risks from inhalation of toxic air contaminant emissions are addressed in Section 4.6, *Greenhouse Gases*, and Section 4.7.1, *Human Health Risk Assessment*, of this Draft EIR, respectively.

The air quality impact analyses for criteria pollutants presented below include evaluations for emission inventories (i.e., the quantities of specific pollutants, typically expressed in pounds per day or tons per year) based on emission modeling and for ambient concentrations (i.e., the concentrations of specific pollutants within ambient air, typically expressed in terms of micrograms per cubic meter) based on dispersion modeling. The criteria pollutant emissions inventories and ambient concentrations were developed using standard industry software/models and federal-, state-, and locally-approved methodologies. Results of the emission inventories from emission modeling were compared to daily thresholds established by the South Coast Air Quality Management District (SCAQMD) for the South Coast Air Basin. Results of the ambient concentrations from dispersion modeling were compared to the California Ambient Air Quality Standards (CAAQS) and the National Ambient Air Quality Standards (NAAQS).

This section is based in part on more comprehensive information contained in Appendix C, *Air Quality*.

4.2.1.1 Pollutants of Interest

Six criteria pollutants were evaluated for the SPAS air quality analysis including sulfur dioxide (SO_2), carbon monoxide (CO), particulate matter with an aerodynamic diameter less than or equal to 10 micrometers (PM10), particulate matter with an aerodynamic diameter less than or equal to 2.5 micrometers (PM2.5), nitrogen dioxide (NO_2), and ozone (O_3) using as surrogates volatile organic compounds (VOC) and oxides of nitrogen (NO_x). These pollutants were analyzed because they were shown to have significant impacts in the air quality analysis documented in Section 4.6, *Air Quality*, of the LAX Master Plan Final EIR. Although lead (Pb) is a criteria pollutant, it was not evaluated in this EIR under the air quality section because construction or operation of any of the SPAS alternatives would have a negligible impact on Pb emissions in the South Coast Air Basin. However, Pb is evaluated in Section 4.7.1, *Human Health Risk Assessment*, as a trace toxic air contaminant in jet fuel. Sulfate compounds (e.g., ammonium sulfate) are generally not emitted directly into the air but are formed through various chemical reactions in the atmosphere; thus, sulfate is considered to be a secondary pollutant. All sulfur emitted by airport-related sources included in this analysis was assumed to be released and to remain in the atmosphere as SO_2. Therefore, no sulfate inventories or concentrations were estimated.

Following standard industry practice, the evaluation of O_3 was conducted by evaluating emissions of VOC and NO_x, which are precursors in the formation of O_3. Ozone is a regional pollutant and ambient concentrations can only be predicted using regional photochemical models that account for all sources of precursors, which is beyond the scope of this analysis. Therefore, no photochemical O_3 modeling was conducted for SPAS. Additional information regarding the six criteria pollutants that were evaluated in the air quality analysis is presented below.

Ozone (O_3)

Ozone, commonly referred to as smog, is formed in the atmosphere rather than being directly emitted from pollutant sources. Ozone forms as a result of VOCs and NO_x reacting in the presence of sunlight in the atmosphere. Ozone levels are highest in warm-weather months. VOCs and NO_x are termed "O_3 precursors" and their emissions are regulated in order to control the creation of O_3.

Ozone damages lung tissue and reduces lung function. Scientific evidence indicates that ambient levels of O_3 not only affect people with impaired respiratory systems (e.g., asthmatics), but also healthy children and adults. Ozone can cause health effects such as chest discomfort, coughing, nausea, respiratory tract and eye irritation, and decreased pulmonary functions.

Carbon Monoxide (CO)

Carbon monoxide is an odorless, colorless gas that is toxic. It is formed by the incomplete combustion of fuels. The primary sources of this pollutant in Los Angeles County are automobiles and other mobile vehicles. The health effects associated with exposure to CO are related to its interaction with hemoglobin once it enters the bloodstream. At high concentrations, CO reduces the amount of oxygen in the blood, causing heart difficulties in people with chronic diseases, reduced lung capacity, and impaired mental abilities.

Particulate Matter (PM10) and Fine Particulate Matter (PM2.5)

Particulate matter consists of solid and liquid particles of dust, soot, aerosols, and other matter small enough to remain suspended in the air for a long period of time. PM10 refers to particulate matter with an aerodynamic diameter less than or equal to 10 micrometers and PM2.5 refers to particulate matter with an aerodynamic diameter less than or equal to 2.5 micrometers. Particles smaller than 10 micrometers (i.e., PM10 and PM2.5) represent that portion of particulate matter thought to represent the greatest hazard to public health. PM10 and PM2.5 can accumulate in the respiratory system and are associated with a variety of negative health effects. Exposure to particulate matter can aggravate existing respiratory conditions, increase respiratory symptoms and disease, decrease long-term lung function, and possibly cause premature death. The segments of the population that are most sensitive to the negative effects of particulate matter in the air are the elderly, individuals with cardiopulmonary disease, and children. Aside from adverse health effects, particulate matter in the air causes a reduction of visibility and damage to paints and building materials.

A portion of the particulate matter in the air comes from natural sources such as windblown dust and pollen. Man-made sources of particulate matter include fuel combustion, automobile exhaust, field burning, factories, and vehicle movement or other man-made disturbances of unpaved areas. Secondary formation of particulate matter may occur in some cases where gases such as sulfur oxides (SO_x)[64] and NO_x interact with other compounds in the air to form particulate matter. In the South Coast Air Basin, both VOCs and ammonia are also considered precursors to PM2.5. Fugitive dust generated by construction activities is a major source of suspended particulate matter.

The secondary creators of particulate matter, SO_2, and NO_x, are also major precursors to acidic deposition (acid rain). While SO_2 is a major precursor to particulate matter formation, NO_x has other environmental effects. NO_x reacts with ammonia, moisture, and other compounds to form nitric acid and related particles. Human health concerns include effects on breathing and the respiratory system, damage to lung tissue, and premature death. Small particles penetrate into sensitive parts of the lungs and can cause or worsen respiratory disease. NO_x has the potential to change the composition of some species of vegetation in wetland and terrestrial systems, to create the acidification of freshwater bodies,

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64 The term SO_x accounts for distinct but related compounds, primarily SO_2 and, to a far lesser degree, sulfur trioxide (SO_3). As a conservative assumption for this analysis, it was assumed that all SO_x is emitted as SO_2, therefore SO_x and SO_2 are considered equivalent in this document and only the latter term is used henceforth.

impair the aquatic visibility, create eutrophication of estuarine and coastal waters, and increase the levels of toxins harmful to aquatic life.

Nitrogen Dioxide (NO_2)

Nitrogen dioxide is a poisonous, reddish-brown to dark brown gas with an irritating odor. NO_2 forms when nitric oxide (NO) reacts with atmospheric oxygen. Most sources of NO_2 are man-made; the primary source of NO_2 is high-temperature combustion. Significant sources of NO_2 at airports are boilers, aircraft operations, and vehicle movements. NO_2 emissions from these sources are highest during high-temperature combustion, such as aircraft takeoff mode. The emissions of NO_x were used to determine NO_2 impacts.

NO_2 may produce adverse health effects such as nose and throat irritation, coughing, choking, headaches, nausea, stomach or chest pains, and lung inflammation (e.g., bronchitis, pneumonia).

Sulfur Dioxide (SO_2)

Sulfur oxides are formed when fuel containing sulfur (typically, coal and oil) is burned, and during other industrial processes. Higher SO_2 concentrations are found in the vicinity of large industrial facilities than elsewhere. The physical effects of SO_2 include temporary breathing impairment, respiratory illness, and aggravation of existing cardiovascular disease. Children and the elderly are most susceptible to the negative effects of exposure to SO_2.

4.2.1.2 Scope of Analysis

As discussed above, the air quality analysis conducted for SPAS addresses construction-related impacts for the peak day of proposed construction activities and operations-related impacts for the future horizon year (2025). The basic steps involved in performing the analysis are listed below.

Construction

- Identify construction-related emissions sources associated with the SPAS alternatives.
- Develop peak daily construction emissions inventories for each alternative.
- Compare emissions inventories with appropriate CEQA thresholds for construction.
- Conduct dispersion modeling of project construction emissions.
- Obtain background concentration data from SCAQMD and estimate future concentrations with construction of each alternative.
- Compare peak concentration results with appropriate CEQA thresholds for construction.
- Identify potential construction-related mitigation measures beyond LAX Master Plan commitments and mitigation measures (if required).

Operations

- Identify operational emission sources potentially affected by the SPAS alternatives.
- Develop peak daily operational emissions inventories for the identified sources in 2025.
- Compare emissions inventories with the appropriate CEQA thresholds for operations.
- Conduct dispersion modeling for operational emissions in 2025.
- Obtain background concentration data from SCAQMD and estimate future concentrations with SPAS.
- Compare peak concentration results with appropriate CEQA thresholds for operations.
- Identify potential operations-related mitigation measures beyond LAX Master Plan commitments and mitigation measures (if required).

4.2.2 Methodology

4.2.2.1 Construction

Construction-related emissions inventories were developed for CO, VOC, NO_x, SO_2, PM10, and PM2.5 for the SPAS alternatives. The inventories include off-road and on-road construction equipment. Emissions from off-road and on-road equipment (tractor trailers, light-duty trucks, employee vehicles, etc., which can travel on highways and local roads) were evaluated separately to account for the California Air Resources Board's (CARB's) published emission factors for both categories of equipment. Fugitive dust emissions resulting from excavation, dirt transfer operations, wind erosion of storage piles, and particle entrainment from vehicle travel on paved and unpaved roadways were also quantified as part of the construction emissions inventories.

Use of diesel particulate matter filters, as previously required by LAWA construction policy, is assumed to be part of the project rather than additional mitigation.

Due to the conceptual nature of the SPAS alternatives, specific construction schedules and phasing programs for the alternatives were not available at this level of planning. Therefore, to estimate the construction emissions from each SPAS alternative, the construction activity level presented for Alternative D in the LAX Master Plan Final EIR was used as a basis for determining construction emissions associated with the other alternatives. Daily estimates of equipment usage (in hours) were developed as part of the LAX Master Plan Final EIR for specific Alternative D construction activities and crews (e.g., demolition, earthwork, and pavement) and then used to calculate construction emissions by activity based on the number and types of construction crews and the proposed construction schedule/duration for that activity. The emission factors were updated for the SPAS analysis to be consistent with the current CARB-approved mobile source emission models, as discussed below. The construction activity levels for the LAX Master Plan Alternative D were multiplied by the updated emissions factors to generate activity-specific emissions. The Alternative D activity emissions estimates were then multiplied by scaling factors, which were calculated using relative construction cost and acreage estimates for the SPAS alternatives activities, to calculate the activity-specific emissions for each SPAS alternative. Once this was completed, the emissions for each activity that were part of a given alternative were summed to calculate the total construction emissions for that alternative. The total construction emissions associated with each alternative were divided by 11 to determine the average annual emissions (i.e., assumed 11-year construction period for all alternatives), then divided by 300 (assumed number of work days per year) to determine average daily emissions, and then divided by 10 (assumed number of hours worked per day) to determine average hourly emissions. To determine peak daily emissions and peak hourly emissions (for dispersion modeling), the average daily and hourly values were doubled.

Off-Road Equipment

Off-road construction equipment includes dozers, loaders, sweepers, and other heavy-duty construction equipment that is not licensed to travel on public roadways. Off-road equipment types, models, and horsepower ratings were those originally determined for the LAX Master Plan. Off-road diesel exhaust emission factors for CO, VOC, NO_x, and PM10 were developed based on calendar year 2015 emission rates from CARB's OFFROAD2007[65] Model for CO and 2011 Inventory Model for In-Use Off-Road Equipment[66] for all other pollutants. PM2.5 emission factors were developed using the PM10 emission

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65 California Air Resources Board, OFFROAD2007 Model, Available: http://www.arb.ca.gov/msei/offroad/offroad.htm.

66 California Air Resources Board, 2011 Inventory Model for In-Use Off-Road Equipment, Available: http://www.arb.ca.gov/msei/categories.htm#offroad_motor_vehicles.

factors and PM2.5 size profiles derived from the CARB-approved California Emission Inventory and Reporting System (CEIDARS).[67]

Emissions for off-road equipment were calculated by multiplying an emission factor by the horsepower, usage factor, and operational hours for each type of equipment (load factors were not applied because they were already accounted for in the provided emission rates). Select equipment was assumed to be equipped with diesel particulate filters (DPFs) achieving PM10 emissions reductions ranging from 8.5 to 76.5 percent, as required by the LAX Master Plan mitigation program.

On-Road On-Site Equipment

On-road on-site equipment emissions are generated from on-site pick-up trucks, water trucks, dump trucks, haul trucks, cement trucks,[68] and other on-road vehicles (i.e., vehicles licensed to travel on public roadways). Exhaust emissions from on-road on-site sources were calculated using calendar year 2015[69] emission factors for CO, VOC, NO_x, and PM10 from CARB's emission factor model EMFAC2011.[70]

On-road on-site equipment types were substituted with vehicle types corresponding to CARB vehicle classes. Emissions for gasoline-powered vehicles were based on passenger car (LDA) and medium-duty truck (MDV) EMFAC2011 emission factors, while emissions factors for heavy-duty diesel vehicles were based on heavy-heavy-duty diesel tractor truck (T7) EMFAC2011 emission factors.

EMFAC2011 emission factors, expressed in grams per mile, were used to calculate emissions. The EMFAC factors account for start-up, running, and idling. In addition, the VOC emission factors include diurnal, hot soak, running, and resting emissions, and the PM10 and PM2.5 factors include tire and brake wear.

Fugitive Dust

An additional source of PM10 and PM2.5 emissions associated with construction activities is fugitive dust. Fugitive dust includes resuspended road dust from both off- and on-road vehicles, as well as dust from grading, loading, and unloading activities. All haul trucks, flatbed trucks, and automobiles were assumed to travel on paved roads. Fugitive dust emissions (PM10 and PM2.5) were calculated using the U.S. Environmental Protection Agency's (USEPA's) *Compilation of Air Pollutant Emission Factors (AP-42)*[71] and SCAQMD's *CEQA Air Quality Handbook*.[72] Watering, as required under LAWA construction contracts and also being one of the main dust suppression measures recognized in SCAQMD Rule 403, was assumed to reduce fugitive dust emissions by 50 percent.

Fugitive VOCs

Due to the order-of-magnitude nature of the construction emissions inventory, activities deemed to be insignificant relative to overall project emissions were not quantified. Types of activities deemed to be insignificant include VOC emissions from architectural coatings, solvents, hot-mix asphalt paving and runway/taxiway striping. Most surface coatings by 2015 are assumed to be water-based (as many of them are today) and coating manufacturers would continue to be required to comply with SCAQMD rules

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67 California Air Resources Board, California Emission Inventory and Reporting System (CEIDARS) - Particulate Matter (PM) Speciation Profiles - Summary of Overall Size Fractions and Reference Documentation, July 28, 2009, Available: http://www.arb.ca.gov/ei/speciate/pmsizeprofile07282009.xls.

68 While it is anticipated that much, if not most, of the concrete needs associated with the SPAS improvements would be provided by an on-site concrete batch plant(s), for which LAWA currently has the necessary SCAQMD and USEPA (CAA Title V) permits, it is likely that some amount of concrete (i.e., specialty concrete) would come from off-site plants and be delivered by truck.

69 2015 is the assumed date for the start of construction and represents a conservative assumption for later years.

70 California Air Resources Board, Research Division, EMFAC2011 On-Road Emissions Inventory Estimation Model, Available: http://www.arb.ca.gov/msei/modeling.htm.

71 U.S. Environmental Protection Agency, Compilation of Air Pollutant Emission Factors AP-42, Fifth Ed, 1995.

72 South Coast Air Quality Management District, CEQA Air Quality Handbook, 1993 and on-line updates.

and regulations governing the use of coatings and solvents while CARB continues to regulate the VOC content of consumer products such as aerosol spray paint.[73]

Worker Commute Trips

Emissions from worker commute trips were calculated using EMFAC2011 and an assumption of the same number of workers per crew and vehicle miles traveled (VMT) per day as was in the LAX Master Plan Final EIR Alternative D analysis. Construction-worker vehicle emissions include: vehicle exhaust, tire wear, brake wear, and paved road dust using SCAQMD default assumptions for vehicle fleet mix, travel distance, and average travel speeds.

Construction Dispersion Modeling

Dispersion modeling of construction emissions was conducted for each alternative. The analysis was conducted using the American Meteorological Society (AMS)/EPA Regulatory Model (AERMOD) air dispersion model.

Sources

Construction activities were assumed to be located on the north airfield and at the north terminals, in the Central Terminal Area (CTA), at Manchester Square, in the current Parking Lot C, at the proposed Intermodal Transportation Facility (ITF) site just south of Lot C, on the east side of Aviation Boulevard south of Century Boulevard, on the Automated People Mover (APM) routes along Century Boulevard and 98th Street, and on the west side where batch plant operations permitted by the SCAQMD and USEPA and project support activities could occur. The analysis was conducted using normalized emissions rates (1 gram per second) for each construction source area to determine the concentration-to-emission ratio (X/Q) at each receptor for each source or source group. This X/Q ratio for a given source or source group were multiplied by the estimated emissions for a specific pollutant to obtain that pollutant's concentration at each receptor for the given source or group. The results for all sources in a given alternative were summed for each pollutant to obtain the project's construction activity contribution to ambient concentrations.

Receptors

Receptor points are the geographic locations where the air dispersion model calculates air pollutant concentrations. These receptor locations were placed in areas where the general public has unrestricted access. Receptors were located on the airport property line shown in each alternative and on-airport in the CTA.

Meteorology

Airport-specific meteorological data were used to analyze air quality impacts. The data set used consisted of twelve continuous months of hourly surface data collected at LAX for calendar year 2007, the most recent data year available from the SCAQMD's on-airport meteorological station. This data set, provided by the SCAQMD, included ambient temperature, wind speed, wind direction, and atmospheric stability parameters, as well as mixing height parameters from the appropriate upper air station, and was provided "AERMOD-ready," including hourly O_3 concentrations from the LAX Hastings monitoring station collected in 2007. The location of the on-airport SCAQMD meteorological and air quality monitoring station is identified in **Figure 4.2-1**.

4.2.2.2 Operations

The objectives of this analysis are to determine baseline ambient air quality in the vicinity of the airport, quantify baseline LAX-related emissions, and predict future LAX-related operational emissions and the associated impact on local ambient air quality.

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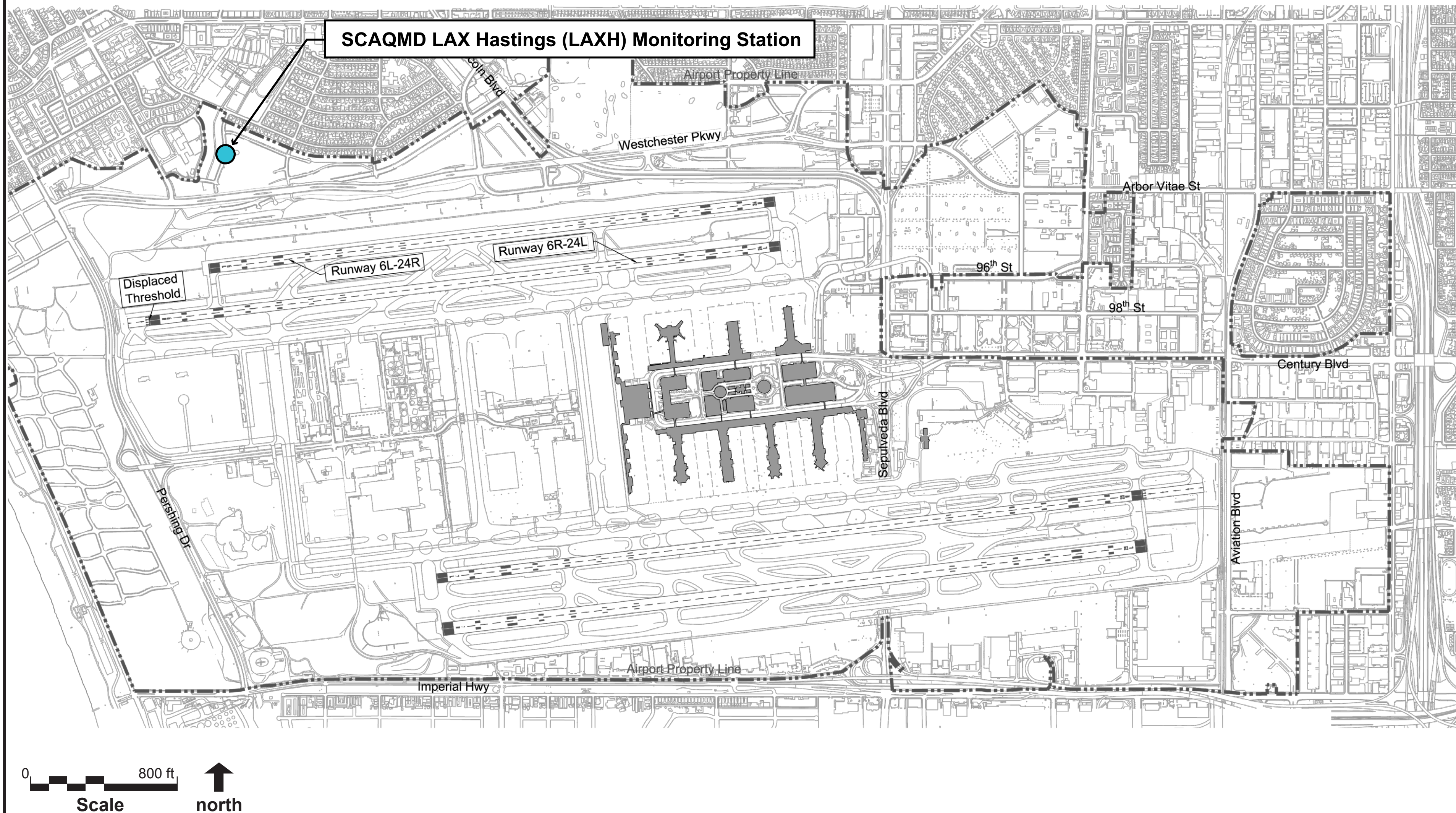
[73] South Coast Air Quality Management District, Rules and Regulations, Available: http://www.aqmd.gov/rules.



Source: SCAQMD, 2012.
Prepared by: CDM Smith, 2012.

LAX Specific Plan Amendment Study Draft EIR	SCAQMD On-Airport Meteorological and Air Quality Monitoring Station Location	Figure 4.2-1

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This operational air quality assessment was conducted in accordance with the SCAQMD's *CEQA Air Quality Handbook*[74] for evaluating air quality impacts. The methodology for determining baseline conditions, estimating airport-related emissions and dispersion, and assessing the significance of impacts followed standard practices for determining impacts of aviation sources that have been found acceptable by USEPA, CARB, and SCAQMD, and the methodology is summarized below.

In accordance with the State CEQA Guidelines and the *L.A. CEQA Thresholds Guide*, the impacts of the SPAS alternatives were compared to baseline conditions to determine significance under CEQA. For purposes of this analysis, the baseline conditions represent activity levels at LAX in 2009 and facilities generally as of 2010.

Emission Source Types

As part of the analysis, both on- and off-airport emission sources associated with LAX were identified. The air quality impact analysis addressed sources located on airport property, motor vehicles carrying passengers and cargo to or from the airport, and construction activity on airport property. These sources were divided into two general categories: mobile and stationary. Examples of LAX-related mobile sources include aircraft, ground support equipment (GSE), and on-road motor vehicles. Examples of LAX-related stationary sources are natural gas space heaters and water heaters.

Mobile Sources

For purposes of this analysis, mobile sources include both off-road sources and on-road vehicles. Off-road sources include aircraft, on-board auxiliary power units (APUs), and GSE that operate in the nonpublic access areas of LAX. An APU is a small, on-board engine that operates to provide power to an aircraft for lights and ventilation while it is parked at the gate when the main engines are off. GSE are surface vehicles used to service a flight while an aircraft is parked at a gate, including baggage tugs, lavatory carts, and push-back tractors. On-road vehicles include the automobiles, trucks, buses, and other motor vehicles that operate on the public roadways and in the parking areas at and near LAX.

Aircraft

Information on the number and types of aircraft operations considered at LAX for 2009 and 2025 was developed as part of the LAX SPAS forecasts. The aircraft activity levels for baseline conditions are from calendar year 2009 (i.e., full years' worth of aircraft activity data in order to develop peak month average day activity characteristics to be used in modeling). The aircraft activity levels for future conditions were based on aircraft activity growth forecasts for LAX in the year 2025. These data were used to develop airport simulation models (SIMMOD) of aircraft operations for baseline (2009) conditions and future (2025) conditions. The simulation models used information about facilities and operations to predict specific timing, volume, and location (e.g., runway used) for future aircraft operations. This modeling provides specific information regarding aircraft engine operations, such as time-in-mode (i.e., the amount of time aircraft engines are idling, or being used for taxiing, or are in take-off or landing modes), that is used to estimate aircraft emissions. Detailed SIMMOD runs were completed for Alternatives 1 through 4. For Alternatives 5 through 7, the existing SIMMOD data were reviewed to assess the operational characteristics applicable to those alternatives and adjusted where necessary to reflect the airfield design configuration specific to each alternative. Such adjustments took into account the runway improvements associated with each alternative, particularly whether a runway would be relocated closer to or farther from the CTA, as this would affect aircraft taxiing distance/time, and the extent a runway relocation would result in a loss of aircraft gates on the north side of the CTA, potentially causing aircraft to use more gates on the south side of the CTA.

The SIMMOD analyses of forecasted aircraft activity considered various weather conditions that affect the flight rules (visual or instrument). Visual flight rule conditions dominate the activity at LAX, representing roughly 96 percent of the time. Instrument flight rule conditions represent only 4 percent of the time, but

[74] South Coast Air Quality Management District, CEQA Air Quality Handbook, 1993 and on-line updates.

produce the highest emissions from aircraft per hour, due to increased ground delay (idle) time. Therefore, both visual and instrument flight rule conditions were analyzed for air emissions. The peak daily and hourly emissions, due to instrument flight rule conditions, were used for comparison to daily emission significance thresholds and resulting concentrations were compared to short-term ambient air quality standards or thresholds. Annual average impacts (generated with visual flight rule conditions) were used for comparison to annual ambient air quality standards.

GSE and APU

Data on the specific GSE types and times-in-mode[75] used for servicing several common aircraft types were obtained from a survey at LAX. Default APU information included in the Federal Aviation Administration's (FAA's) Emissions and Dispersion Modeling System (EDMS), Version 5.1.3,[76] was used to supplement the site-specific data. EDMS is an air quality model that estimates emissions from airport sources based on information input to the model, and considers the sources and meteorological conditions to estimate "dispersion" -- how the pollutants behave and what the pollutant concentrations will be at specified locations. EDMS was used as the primary model in developing airport emissions inventories for baseline (2009) conditions and for the SPAS alternatives in 2025. Default GSE information included in EDMS, along with emission factors taken from CARB's OFFROAD2007 model and the *2011 Inventory Model for In-Use Off-Road Equipment*[77] were used to supplement the site-specific data. The use of alternative-fueled GSE under baseline conditions was also determined. The future year inventories of alternative-fueled GSE were based on these evaluations and LAX environmental policies.

On-Road Vehicles

All vehicles traveling to or from LAX were considered in the analysis, including privately-owned vehicles, government-owned vehicles, and commercially-owned vehicles such as rental cars, shuttles, buses, taxicabs, and trucks. Temporal data that identify the vehicle volumes by hour of the day for traffic and on-airport parking were determined from the transportation analysis, which is based on data for all of calendar year 2009.

Stationary Sources

Stationary sources include primarily significant fixed combustion equipment, such as space and water heaters that provide warm air and hot water to the terminals and other airport buildings. In addition, incremental electric energy demand will be provided by off-airport utility plants.

Emissions Estimating

The emissions estimates (also called emissions inventories) were developed using emission factors from various USEPA, FAA, CARB, and SCAQMD references.

Mobile Sources

As noted above, for purposes of this analysis, mobile sources include both off-road sources (aircraft, APUs, and GSE) and on-road vehicles that operate on the public roadways and in the parking areas at and near LAX.

Aircraft criteria pollutant emissions were calculated using the FAA's EDMS. Emissions of particulate matter from aircraft were calculated using the First Order Approximation (FOA) Version 3 as found in EDMS.

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75 Time-in-mode is the time that an emission source spends in a specific mode of operation.

76 U.S. Department of Transportation, Federal Aviation Administration, Emissions and Dispersion Modeling System (EDMS 5.1.3) User's Manual (FAA-AEE-07-01 Rev. 8 - 11/15/10), 2010.

77 California Air Resources Board, 2011 Inventory Model for In-Use Off-Road Equipment, was used for diesel equipment (with the exception of CO); otherwise, OFFROAD2007 was used.

Emissions produced by LAX activity during four aircraft operational modes (approach, taxi/idle, takeoff, and climbout) were calculated for each alternative. Airport-specific taxi/idle times-in-mode were used in the modeling, because LAX handles more operations than a typical airport. Taxi and queue (idle) times were developed from the LAX SPAS SIMMOD results. The EDMS default times-in-mode were the basis for climbout, approach, and takeoff times; however, climbout and approach times were adjusted according to the average mixing height[78] adjustment parameters contained in EDMS. For LAX, a mixing height of 1,806 feet above mean sea level was used in the emissions modeling to be consistent with emissions calculations performed for the SCAQMD.[79]

GSE and APU

Emissions from GSE and APUs were calculated using the accepted procedures in *Air Quality Procedures for Civilian Airports and Air Force Bases*[80] (FAA Air Quality Procedures). Emission factors for gasoline, diesel, and compressed natural gas (CNG)/liquefied natural gas (LNG)[81] fueled GSE were obtained from CARB's OFFROAD2007 model and the *2011 Inventory Model for In-Use Off-Road Equipment*.[82] It was assumed that 400 hertz (Hz) electric power and preconditioned air would be available at all commercial airline gates. However, since APUs would continue to be used some of the time, APU emission factors from EDMS were used to generate APU emission rates.

On-Road Vehicles

Emissions from on-road vehicles for all alternatives were estimated using CARB-mandated methodology. Future year emissions from on-road vehicles were calculated using the CARB Emission Factor 2011 model, or EMFAC2011 (described above), approved for use by USEPA. EMFAC2011 uses site-specific data regarding vehicle trip distances, idle times, hot start vs. cold soak,[83] and average travel speeds to estimate vehicle emissions. Temporal data[84] for traffic and on-airport parking were determined from the transportation analysis.

Stationary Sources

The emissions of criteria pollutants associated with natural gas space heaters and water heaters were estimate using the California Emission Estimator Model (CalEEMod)[85] maintained by SCAQMD. Estimates of natural gas usage were based on facility size (square feet) and type. The terminal and building size increases for each alternative were used in CalEEMod to estimate emissions of CO, VOC, NO_x, SO_2, PM10, and PM2.5.

The emissions of criteria pollutants associated with off-airport utility plant operations necessary to support the additional on-airport electricity demand was estimated base on the following assumptions: power production in the South Coast Air Basin is primarily by natural gas fired power plants; the CO_2 emissions estimated by CalEEMod for off-airport GHG electric utility emissions are from these natural gas facilities;

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78 Mixing height is the vertical distance between the earth's surface and the height to which convection movements within the atmosphere extend, typically a few thousand feet. The height is often located at the interface of warm air situated on top of cooler air (thermal inversion). The thermal inversion suppresses turbulent mixing and thus limits the upward dispersion of polluted air.

79 South Coast Air Quality Management District, Development of the 2002 Aircraft Emission Inventory and Projected Activity and Emissions for 2010, 2020, and 2030, prepared by Eastern Research Group, November 17, 2005.

80 U.S. Department of Transportation, Federal Aviation Administration, Office of Environment and Energy, and U.S. Air Force Armstrong Laboratory, Tyndall Air Force Base, Air Quality Procedures for Civilian Airports and Air Force Bases, 1997.

81 The CNG/LNG emission factors were used for natural gas and propane/LPG fueled equipment.

82 California Air Resources Board, 2011 Inventory Model for In-Use Off-Road Equipment was used for diesel equipment (with the exception of CO); otherwise, OFFROAD2007 was used.

83 A hot start occurs when a vehicle is started before the engine has cooled from its previous use. A cold soak is when the engine has reached ambient temperature from its previous use and needs to warm up again. Cold soaks result in greater emissions of air pollutants.

84 Temporal data provides information about the timing of operation and activities by hour-of-day, day-of-week, or month-of-year.

85 South Coast Air Quality Management District, California Emissions Estimator Model™ User's Guide - Version 2011.1, prepared by ENVIRON International Corporation, February 2011.

the higher heating value for natural gas is 1,020 Btu/cubic foot;[86] emission factors from USEPA[87] were used for CO, VOC, SO_2, and PM10; NO_x emissions complied with SCAQMD Rule 1135; PM2.5 emissions were the same as PM10; and 22 percent of the total power provided by the Los Angeles Department of Water and Power (LADWP) is generated in the South Coast Air Basin.[88]

Dispersion Modeling

Air dispersion modeling is used to predict ground-level ambient air[89] concentrations of pollutants in the vicinity of known air emission sources. Concentrations of criteria air pollutants were determined at publicly accessible areas on and off airport property and at the property line.

Models

Dispersion of the on-airport pollutant emissions was predicted for mobile and stationary (including area and volume) sources using EDMS. EDMS is the FAA-required model[90] for airport air quality analysis of aviation sources and was used to develop projected concentrations of air pollutants associated with the SPAS alternatives. The AMS/AERMOD system, which is incorporated into EDMS, represents the latest joint effort by both the AMS and the USEPA to develop a state-of-the-art dispersion model.

Ozone Limiting Method for NO_2 Modeling

To provide a more reasonable estimate of the one-hour NO_2 concentrations from operations, the Ozone Limiting Method (OLM) was used to determine the 1-hour NO_x-to-NO_2 concentrations for all alternatives. The OLM uses O_3 concentrations and the chemical formation of NO and NO_2 to determine hourly NO_2 concentrations at each individual receptor. The OLM is incorporated into the AERMOD model, which is the dispersion modeling platform within EDMS. The model uses one year of hourly meteorological data and one year of hourly O_3 data. The meteorological data discussed below were used for this analysis; these data incorporate one year of O_3 data collected by SCAQMD at the LAX Hastings monitoring station (monitoring station No. 820).

Meteorology

As indicated previously, airport-specific meteorological data were used to analyze air quality impacts. The data set used consisted of twelve continuous months of hourly surface data collected at LAX for calendar year 2007, the most recent data year available from the SCAQMD's on-airport meteorological and air quality monitoring station. This data set, provided by the SCAQMD, included ambient temperature, wind speed, wind direction, atmospheric stability, and mixing height parameters from the appropriate upper air station, and was provided "AERMOD-ready" including hourly O_3 concentrations from the LAX Hastings monitoring station collected in 2007. The location of this station is identified in **Figure 4.2-1**.

Source and Receptor Locations

Locations for mobile and stationary emissions sources were determined from a review of the proposed airport layouts for each alternative. Receptor points are the geographic locations where the air dispersion model calculates air pollutant concentrations. These receptor locations were placed in areas where the general public has unrestricted access. Receptors were located on the airport property line shown in each alternative and on-airport at the Theme Building.

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86 U.S. Environmental Protection Agency, AP-42 - Compilation of Air Pollutant Emission Factors, Fifth Edition, Section 1.4 "Natural Gas Combustion," January 1995.

87 U.S. Environmental Protection Agency, AP-42 - Compilation of Air Pollutant Emission Factors, Fifth Edition, Section 1.4 "Natural Gas Combustion," January 1995.

88 Los Angeles Department of Water and Power, 2011 Power Integrated Resource Plan, December 22, 2011.

89 Ambient air is typically considered to be air in locations where the general public has unrestricted access; see 40 CFR 50.1(e), July 1, 2011.

90 Federal Register, Vol. 63, No. 70, April 13, 1998, pp. 18068-18069.

4.2.3 Existing Conditions

Baseline conditions for ambient air pollutant concentrations discussed herein refer to calendar year 2009, the last full calendar year for which air quality data were available from SCAQMD when the air quality analysis was prepared and the last full year of operational data prior to publication of the SPAS Notice of Preparation. As indicated previously, the airport is located within the South Coast Air Basin of California, a 6,745 square-mile area encompassing all of Orange County and the urban, non-desert portions of Los Angeles, Riverside, and San Bernardino Counties.

4.2.3.1 Climatological Conditions

The meteorological conditions at the airport are heavily influenced by the proximity of the airport to the Pacific Ocean to the west and the mountains to the north and east. This location tends to produce a regular daily reversal of wind direction: onshore (westerly) during the day and offshore (easterly) at night. Comparatively warm, moist Pacific air masses drifting over cooler air resulting from coastal upwelling of cooler water often form a bank of fog that is generally swept inland by the prevailing westerly winds. The "marine layer" is generally 1,500 to 2,000 feet deep, extending only a short distance inland and rising during the morning hours producing a deck of low clouds. The air above is usually relatively warm, dry, and cloudless. The prevalent temperature inversion in the South Coast Air Basin tends to prevent vertical mixing of air through more than a shallow layer.

A dominating factor in the weather of California is the semi-permanent high-pressure area of the North Pacific Ocean. This pressure center moves northward in summer, holding storm tracks well to the north, and minimizing precipitation. Changes in the circulation pattern allow storm centers to approach California from the southwest during the winter months and large amounts of moisture are carried ashore. The Los Angeles region receives on average 10 to 15 inches of precipitation per year, of which 83 percent occurs during the months of November through March. Thunderstorms are light and infrequent, and on very rare occasions, trace amounts of snowfall have been reported at the airport.

The annual minimum mean, maximum mean, and overall mean temperatures at the airport are 55 degrees Fahrenheit (°F), 70°F, and 63°F, respectively. The prevailing wind direction at the airport is from the west-southwest with an average wind speed of roughly 6.4 knots (7.4 miles per hour [mph] or 3.3 meters per second [m/s]). Maximum recorded gusts range from 27 knots (31 mph or 13.9 m/s) in July to 54 knots (62 mph or 27.8 m/s) in March. The monthly average wind speeds range from 5.7 knots (6.5 mph or 2.9 m/s) in December to 7.4 knots (8.5 mph or 3.8 m/s) in April.[91]

4.2.3.2 Regulatory Setting

Air quality is regulated by federal, state, and local laws. In addition to rules and standards contained in the federal Clean Air Act (CAA) and the California Clean Air Act (CCAA), air quality in the Los Angeles region is subject to the rules and regulations established by CARB and SCAQMD with oversight provided by USEPA, Region IX.

Federal

The USEPA is responsible for implementation of the CAA. The CAA was first enacted in 1955 and has been amended numerous times in subsequent years (1963, 1965, 1967, 1970, 1977, 1990, and 1997). Under the authority granted by the CAA, USEPA has established NAAQS for the following criteria pollutants: CO, Pb, NO_2, O_3, PM10, PM2.5, and SO_2. **Table 4.2-1** presents the NAAQS that are currently in effect for criteria air pollutants. As discussed previously, O_3 is a secondary pollutant, meaning that it is formed from reactions of "precursor" compounds under certain conditions. The primary precursor compounds that can lead to the formation of O_3 are VOC and NO_x.

[91] Ruffner, J.A., Climates of the States: National Oceanic and Atmospheric Administration Narrative Summaries, Table, and Maps for Each State with Overview of State Climatologist Programs, Third Edition, Volume 1: Alabama-New Mexico, Gale Research Company, 1985.

Table 4.2-1

National and California Ambient Air Quality Standards

Pollutant	Averaging Time	CAAQS	NAAQS Primary	NAAQS Secondary
Ozone (O_3)	8-Hour	0.070 ppm (137 μg/m^3)	0.075 ppm (147 μg/m^3)	Same as Primary
	1-Hour	0.09 ppm (180 μg/m^3)	N/A	N/A
Carbon Monoxide (CO)	8-Hour	9.0 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	N/A
	1-Hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	N/A
Nitrogen Dioxide (NO_2)	Annual	0.030 ppm (57 μg/m^3)	0.053 ppm (100 μg/m^3)	Same as Primary
	1-Hour	0.18 ppm (339 μg/m^3)	0.100 ppm (188 μg/m^3)	N/A[1]
Sulfur Dioxide (SO_2)[2]	Annual	N/A	0.030 ppm (80 μg/m^3)	N/A
	24-Hour	0.04 ppm (105 μg/m^3)	0.14 ppm (365 μg/m^3)	N/A
	3-Hour	N/A	N/A	0.5 ppm (1,300 μg/m^3)
	1-Hour	0.25 ppm (655 μg/m^3)	0.075 ppm (196 μg/m^3)	N/A[1]
Respirable Particulate Matter (PM10)	AAM	20 μg/m^3	N/A	N/A
	24-Hour	50 μg/m^3	150 μg/m^3	Same as Primary
Fine Particulate Matter (PM2.5)	AAM	12 μg/m^3	15.0 μg/m^3	Same as Primary
	24-Hour	N/A	35 μg/m^3	Same as Primary
Lead (Pb)	Rolling 3-month Average	N/A	0.15 μg/m^3	Same as Primary
	Quarterly	N/A	1.5 μg/m^3	Same as Primary
	Monthly	1.5 μg/m^3	N/A	N/A
Sulfates	24-Hour	25 μg/m^3	N/A	N/A

Notes:

NAAQS = National Ambient Air Quality Standards
CAAQS = California Ambient Air Quality Standards
ppm = parts per million (by volume)
μg/m^3 = micrograms per cubic meter
N/A = Not applicable
mg/m^3 = milligrams per cubic meter
AAM = Annual arithmetic mean

Table 4.2-1

National and California Ambient Air Quality Standards

Pollutant	Averaging Time	CAAQS	NAAQS	
			Primary	Secondary

1 On August 1, 2011, the USEPA proposed a 1-hour secondary NO_2 standard that would be set at a level of 100 parts per billion (ppb) and a 1-hour secondary SO_2 standard that would be set at 75 ppb. These secondary standards would be identical to the NO_2 and SO_2 primary 1-hour standards (76 Federal Register [FR] 46084).

2 On June 22, 2010, the 1-hour SO_2 NAAQS was updated and the previous 24-hour and annual primary NAAQS were revoked. The previous 1971 SO_2 NAAQS (24-hour: 0.14 ppm; annual: 0.030 ppm) remain in effect until one year after an area is designated for the 2010 NAAQS (75 FR 35520). On June 20, 2011, CARB recommended to USEPA that all of California be designated attainment; however, USEPA has not yet finalized area designations (Goldstene, James N., Executive Officer, CARB, Letter to Jared Blumenfeld, Regional Administrator, USEPA, June 20, 2011).

Source: California Air Resources Board, Ambient Air Quality Standards Chart, Available: http://www.arb.ca.gov/research/aaqs/aaqs2.pdf, accessed February 17, 2012.

The CAA also specifies future dates for achieving compliance with the NAAQS and mandates that states submit and implement a State Implementation Plan (SIP) for local areas not meeting these standards. These plans must include pollution control measures that demonstrate how the standards will be met. The 1990 amendments to the CAA identify specific emission reduction goals for areas not meeting the NAAQS. These amendments require both a demonstration of reasonable further progress toward attainment and incorporation of additional sanctions for failure to attain or meet interim milestones.

As indicated previously, LAX is included in the South Coast Air Basin, which is a sub-region of the SCAQMD's jurisdiction including all of Orange County and the urban, non-desert portions of Los Angeles, Riverside, and San Bernardino Counties. The South Coast Air Basin is designated as a federal nonattainment area for O_3, PM10, PM2.5, and Pb. Nonattainment designations under the CAA for O_3, CO, and PM10 are classified into levels of severity based on the level of concentration above the standard, which is also used to set the required attainment date. The South Coast Air Basin was redesignated in 1998 to attainment/maintenance for NO_2 because concentrations of that pollutant dropped below (became better than) the NO_2 NAAQS in the early 1990s. More recently, the South Coast Air Basin was redesignated to attainment/maintenance for CO in 2007. Attainment/maintenance means that the pollutant is currently in attainment and that measures are included in the SIP to ensure that the NAAQS for that pollutant are not exceeded again (maintained). The attainment status with regard to the NAAQS is presented in **Table 4.2-2** for each criteria pollutant.

Table 4.2-2

South Coast Air Basin Attainment Status

Pollutant (Status as of August 30, 2011)	National Standards	California Standards
Ozone (O_3)	Nonattainment - Extreme	Nonattainment
Carbon Monoxide (CO)	Attainment - Maintenance	Attainment
Nitrogen Dioxide (NO_2)	Attainment - Maintenance	Nonattainment
Sulfur Dioxide (SO_2)	Attainment	Attainment
Respirable Particulate Matter (PM10)	Nonattainment - Serious	Nonattainment
Fine Particulate Matter (PM2.5)	Nonattainment	Nonattainment
Lead (Pb)	Nonattainment	Nonattainment

Sources: California Air Resources Board, Area Designations Maps/State and National, Available: http://www.arb.ca.gov/desig/adm/adm.htm, accessed February 17, 2012; USEPA, The Green Book Nonattainment Areas for Criteria Pollutants, Available: http://www.epa.gov/oaqps001/greenbk/index.html, accessed February 17, 2012.

State

The CCAA, signed into law in 1988, requires all areas of the state to achieve and maintain the CAAQS by the earliest practicable date. The CAAQS are generally as stringent as, and in several cases more stringent than, the NAAQS; however, in the case of short-term standards for NO_2 and SO_2, the CAAQS are less stringent than the NAAQS. The currently applicable CAAQS are presented with the NAAQS in **Table 4.2-1**. The attainment status with regard to the CAAQS is presented in **Table 4.2-2** for each criteria pollutant. CARB has been granted jurisdiction over a number of air pollutant emission sources that operate in the state. Specifically, CARB has the authority to develop emission standards for on-road motor vehicles, as well as for stationary sources and some off-road mobile sources. In turn, CARB has granted authority to the regional air pollution control and air quality management districts to develop stationary source emission standards, issue air quality permits, and enforce permit conditions.

South Coast Air Quality Management District

SCAQMD has jurisdiction over an area of 10,743 square miles consisting of Orange County and the urban, non-desert portions of Los Angeles, Riverside, and San Bernardino Counties, and the Riverside County portions of the Salton Sea Air Basin and Mojave Desert Air Basin. As described previously, the South Coast Air Basin is a sub-region of SCAQMD's jurisdiction and covers an area of 6,745 square miles. While air quality in this area has improved, the South Coast Air Basin requires continued diligence to meet air quality standards.

The SCAQMD has adopted a series of Air Quality Management Plans (AQMPs) to meet the CAAQS and NAAQS. SCAQMD and CARB have adopted the 2007 AQMP and have submitted it to USEPA for approval, and SCAQMD is currently preparing the 2012 AQMP. The USEPA recently proposed to approve in part and disapprove in part the 2007 AQMP.[92] These plans require, among other emissions-reducing activities, control technology for existing sources; control programs for area sources and indirect sources; a permitting system designed to ensure no net increase in emissions from any new or modified permitted sources of emissions; transportation control measures; sufficient control strategies to achieve a five percent or more annual reduction in emissions (or 15 percent or more in a three-year period) for VOC, NO_x, CO, and PM10; and demonstration of compliance with CARB's established reporting periods for compliance with air quality goals.

The SCAQMD also adopts rules to implement portions of the AQMP. At least one of these rules is applicable to the construction phase of SPAS. Rule 403 requires the implementation of best available fugitive dust control measures during active construction activities capable of generating fugitive dust emissions from on-site earth-moving activities, construction/demolition activities, and construction equipment travel on paved and unpaved roads.

Southern California Association of Governments

The Southern California Association of Governments (SCAG) is the metropolitan planning organization (MPO) for Los Angeles, Orange, Ventura, Riverside, San Bernardino, and Imperial Counties and serves as a forum for the discussion of regional issues related to transportation, the economy, community development, and the environment. As the federally-designated MPO for the Southern California region, SCAG is mandated by the federal government to research and develop plans for transportation, hazardous waste management, and air quality. Pursuant to California Health and Safety Code 40460(b), SCAG has the responsibility for preparing and approving the portions of the AQMP relating to regional demographic projections and integrated regional land use, housing, employment, and transportation programs, measures and strategies. SCAG is also responsible under the CAA for determining conformity of transportation projects, plans, and programs with applicable air quality plans.

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92 U.S. Environmental Protection Agency, "Approval and Promulgation of Implementation Plans; California; 2007 South Coast PM2.5 Plan and 2007 State Strategy, Proposed Rule," Federal Register, 76 (14 July 2011): 41562-41584.

<u>**Other Related Rules and Policies**</u>

In the South Coast Air Basin, the City of Los Angeles, CARB, and the SCAQMD have adopted or proposed additional rules and policies governing the use of cleaner fuels in public vehicle fleets. The City of Los Angeles Policy CF#00-0157 requires that City-owned or operated diesel-fueled vehicles be equipped with particulate traps and that they use ultra-low-sulfur diesel fuel. CARB has adopted a Risk Reduction Plan for diesel-fueled engines and vehicles. The SCAQMD has proposed a series of rules that would require the use of clean fuel technologies in on-road school buses, on-road heavy-duty public fleets, and street sweepers. To be consistent with the air quality analyses conducted for the LAX Master Plan Final EIR and the Final General Conformity Determination, recent plans and policies addressing ground access vehicle emissions have not been incorporated into the air quality impact analysis for SPAS described below. The emission reductions that would be associated with implementation of SCAQMD's clean fuel rules are not incorporated into the SPAS air quality analysis; therefore, the estimate of ground access vehicle emissions is considered conservative.

4.2.3.3 Existing Ambient Air Quality

The SCAQMD maintains a network of air quality monitoring stations located throughout the South Coast Air Basin. The closest monitoring station, and most representative of existing air quality conditions in the project area, is the Southwest Coastal Los Angeles Monitoring Station. In April 2004, this station was established at 7201 W. Westchester Parkway (referred to as the LAX Hastings site), roughly 1.5 miles northwest of the LAX Theme Building and less than 0.5 mile from Runway 6L/24R (northernmost LAX runway). This station monitors O_3, CO, SO_2, NO_2, and PM10. Data available from this monitoring station are summarized for the five-year period of 2006 to 2010 in **Table 4.2-3**. Since PM2.5 has not been monitored at the Southwest Coastal Los Angeles Monitoring Station, data for this pollutant were obtained for the South Coastal Los Angeles County Monitoring Station located at 3648 North Long Beach Boulevard (North Long Beach). In general, the measured concentrations at these locations are below concentrations measured at many of the other monitoring stations around the South Coast Air Basin. It does appear that 2007 showed some increases in several pollutants compared to 2006, especially the PM10 measurements. These PM10 concentrations may have been influenced by the extensive fires that occurred throughout Southern California in the fall of 2007. The fires occurred concurrently with strong Santa Ana winds that blew from the eastern deserts out to the coast, and may have carried the ash to the coastal monitoring stations.

Table 4.2-3

Southwest Coastal Los Angeles and South Coastal Los Angeles County Monitoring Station Ambient Air Quality Data

Pollutant[1,2]	2006	2007	2008	2009	2010
Ozone (O_3)					
Maximum Concentration 1-hr period, ppm	0.084	0.087	0.086	0.077	0.089
Maximum National Concentration 8-hr period, ppm	0.066	0.075	0.075	0.070	0.070
Maximum California Concentration 8-hr period, ppm	0.067	0.076	0.076	0.070	0.070
Carbon Monoxide (CO)					
Maximum Concentration 1-hr period, ppm	3	3	4	3	3
Maximum Concentration 8-hr period, ppm	2.27	2.39	2.53	1.99	2.19
Nitrogen Dioxide (NO_2)					
Maximum Concentration 1-hr period, ppm	0.099	0.084	0.094	0.077	0.076
Annual Arithmetic Mean (AAM), ppm	0.015	0.014	0.014	---[3]	0.012
Sulfur Dioxide (SO_2)					
Maximum Concentration 1-hr period, ppm	0.021	0.019	0.021	0.022	0.026
Maximum Concentration 24-hr period, ppm	0.010	0.009	0.004	0.006	0.004
Annual Arithmetic Mean (AAM), ppm	0.002	0.002	0.001	---[3]	0.000
Respirable Particulate Matter (PM10)[4,5]					
Maximum National Concentration 24-hr period, $\mu g/m^3$	45	128	50	52	37
Maximum California Concentration 24-hr period, $\mu g/m^3$	45	128	50	52	37
Annual National Concentration, $\mu g/m^3$	23.5	29.3	25.6	25.6	20.6
Annual California Concentration, $\mu g/m^3$	---[3]	---[3]	25.5	25.5	---[3]
Fine Particulate Matter (PM2.5)[4,5]					
Maximum National Concentration 24-hr period, $\mu g/m^3$	58.5	82.8	57.2	63.0	35.0
Maximum California Concentration 24-hr period, $\mu g/m^3$	58.5	82.8	57.2	63.0	35.0
Annual National Concentration, $\mu g/m^3$	14.1	14.6	14.1	12.8	10.3

1 Monitoring data from the Southwest Coastal Los Angeles station (Station No. 820) was used for O_3, CO, NO_2, SO_2, and PM10 concentrations. Monitoring Data from the South Coastal Los Angeles County Monitoring Station (Station No. 072) was used for PM2.5 concentrations.
2 An exceedance is not necessarily a violation. Violations are defined in 40 CFR 50 for NAAQS and 17 CCR 70200 for CAAQS.
3 There was insufficient (or no) data available to determine the value.
4 Statistics may include data that are related to an exceptional event.
5 State and national statistics may differ for the following reasons: State statistics are based on California-approved samplers, whereas national statistics are based on samplers using federal reference or equivalent methods. State and national statistics may therefore be based on different samplers.

Source: California Air Resources Board, iADAM: Air Quality Data Statistics, Available: http://www.arb.ca.gov/adam/, accessed February 17, 2012.

4.2.3.4 Existing Airport Emissions

The baseline (2009) airport-related emissions, including those from aircraft, GSE, and APU operations, on-airport and off-airport roadways, parking lots and structures, and the CUP are shown in **Table 4.2-4**.

Table 4.2-4

Baseline (2009) Airport Emissions

	Peak Daily Emissions, lbs/day					
Emission Sources	**CO**	**VOC**	**NO_x**	**SO_2**	**PM10**	**PM2.5**
On-Airport Sources						
Aircraft	12,650	2,056	18,968	1,644	173	173
Auxiliary Power Units	658	59	612	85	97	97
Ground Support Equipment	4,746	383	2,240	<1	62	60
On-Airport Roadways	1,829	174	726	<1	30	27
Parking Facilities	3,425	527	1,790	<1	71	65
On-Airport Stationary[1]	379	12	313	2	37	37
On-Airport Subtotal	**23,687**	**3,211**	**24,649**	**1,730**	**470**	**459**
Off-Airport Sources						
Off-Airport Roadways	55,888	3,322	20,366	<1	689	632
Off-Airport Stationary[2]	41	3	7	<1	4	4
Off-Airport Subtotal	**55,929**	**3,325**	**20,373**	**<1**	**693**	**636**
Total Baseline Emissions	**79,616**	**6,536**	**45,022**	**1,730**	**1,163**	**1,095**

1 On-airport stationary sources are natural gas combustion units for space heating and water heating.

2 Off-airport stationary sources are natural gas combustion electric power generators supplying electricity to project facilities. Estimated that 22% of LADWP power is produced in the South Coast Air Basin (LADWP, 2011).

Sources: CDM Smith, 2012.

4.2.4 Thresholds of Significance

The SCAQMD has developed CEQA operational and construction-related thresholds of significance for air pollutant emissions from projects proposed in the South Coast Air Basin. Construction and operational emission thresholds are summarized in **Table 4.2-5**. In accordance with the SCAQMD *CEQA Air Quality Handbook*, a significant air quality impact would occur if the estimated incremental increase in construction-related emissions attributable to the particular SPAS alternative would be greater than the daily construction emission thresholds presented in **Table 4.2-5**. A significant air quality impact would occur as well if the estimated incremental increase in operational emissions attributable to the particular SPAS alternative would be greater than the operational daily emission thresholds presented in **Table 4.2-5**.

Table 4.2-5

SCAQMD CEQA Thresholds of Significance for Air Pollutant Emissions in the South Coast Air Basin

Pollutant	Mass Emission Thresholds lbs/day Construction	Mass Emission Thresholds lbs/day Operation
CO	550	550
NO_x	100	55
VOC[1]	75	55
SO_2	150	150
PM10	150	150
PM2.5	55	55
Pb	3	3

[1] The emissions of volatile organic compounds (VOC) and reactive organic gases are essentially the same for the combustion emission sources that are considered in this EIR. This EIR will typically refer to organic emissions as VOC.

Source: SCAQMD, 1993, 2011.

The SCAQMD has also developed operational and construction-related thresholds of significance[93] for air pollutant concentration impacts from projects proposed in the South Coast Air Basin. These thresholds are summarized in **Table 4.2-6**. In accordance with the SCAQMD *CEQA Air Quality Handbook*, a significant air quality impact would occur if the estimated incremental ambient concentrations due to construction-related or operations-related emissions would be greater than the concentration thresholds presented in **Table 4.2-6**.

Table 4.2-6

SCAQMD CEQA Thresholds of Significance for Air Pollutant Concentrations in the South Coast Air Basin

Pollutant	Averaging Period	Project-Related Concentration Thresholds Construction	Operation	Project Only or Total[1]
PM10	Annual	1.0 $\mu g/m^3$	1.0 $\mu g/m^3$	Project Only
PM10	24-hour	10.4 $\mu g/m^3$	2.5 $\mu g/m^3$	Project Only
PM2.5	24-hour	10.4 $\mu g/m^3$	2.5 $\mu g/m^3$	Project Only
CO	1-hour	20 ppm (23 mg/m^3)	20 ppm (23 mg/m^3)	Total incl. Background
CO	8-hour	9.0 ppm (10 mg/m^3)	9.0 ppm (10 mg/m^3)	Total incl. Background
NO_2	1-hour (State)	0.18 ppm (339 $\mu g/m^3$)	0.18 ppm (339 $\mu g/m^3$)	Total incl. Background
NO_2	1-hour (Federal)[3]	0.100 ppm (188 $\mu g/m^3$)	0.100 ppm (188 $\mu g/m^3$)	Total incl. Background
NO_2	Annual (State)[2]	0.030 ppm (57 $\mu g/m^3$)	0.030 ppm (57 $\mu g/m^3$)	Total incl. Background

[93] South Coast Air Quality Management District, CEQA Air Quality Handbook, 1993; as updated by "SCAQMD Air Quality Significance Thresholds," March 2011, Available: http://www.aqmd.gov/CEQA/handbook/signthres.pdf.

Table 4.2-6

SCAQMD CEQA Thresholds of Significance for Air Pollutant Concentrations in the South Coast Air Basin

Pollutant	Project-Related Concentration Thresholds			
	Averaging Period	**Construction**	**Operation**	**Project Only or Total[1]**
SO_2	1-hour (State)	0.25 ppm (655 μg/m^3)	0.25 ppm (655 μg/m^3)	Total incl. Background
SO_2	1-hour (Federal)[4]	0.075 ppm (196 μg/m^3)	0.075 ppm (196 μg/m^3)	Total incl. Background
SO_2	24-hour	0.04 ppm (105 μg/m^3)	0.04 ppm (105 μg/m^3)	Total incl. Background

1 The concentration threshold for attainment pollutants (CO and NO_2) is the CAAQS, which is at least as stringent as the NAAQS. The concentration threshold for nonattainment pollutants (PM10 and PM2.5) has been developed by SCAQMD for project construction or operational impacts.
2 The state standard is more stringent than the federal standard.
3 To evaluate project impacts to ambient 1-hour NO_2 levels, the analysis includes both the current SCAQMD 1-hour state NO_2 threshold and the more stringent revised 1-hour federal ambient air quality standard of 188 μg/m^3. To attain this standard, the 3-year average of 98th percentile of the daily maximum 1-hour average at a receptor must not exceed 0.100 ppm.
4 To attain the SO_2 federal 1-hour standard, the 3-year average of the 99th percentile of the daily maximum 1-hour averages at a receptor must not exceed 0.075 ppm.

Source: SCAQMD, 1993, 2011; USEPA, 2010a (75 FR 6474, "Primary National Ambient Air Quality Standards for Nitrogen Dioxide, Final Rule," February 9, 2010) and 2010b (75 FR 35520, "Primary National Ambient Air Quality Standard for Sulfur Dioxide, Final Rule," June 22, 2010).

4.2.5 Applicable LAX Master Plan Commitments and Mitigation Measures

As part of the LAX Master Plan, LAWA adopted commitments and mitigation measures pertaining to air quality (denoted with "AQ") in the Alternative D Mitigation Monitoring and Reporting Program (MMRP). Of the three commitments and four mitigation measures that were designed to address air quality impacts related to implementation of the LAX Master Plan, none of the commitments are applicable to the SPAS alternatives, but all of the mitigation measures are applicable to the SPAS alternatives and were considered in the air quality analysis herein.

The LAX Master Plan Final EIR requires LAWA to expand and revise the existing air quality mitigation programs at LAX through the development of an LAX Master Plan-Mitigation Plan for Air Quality (LAX MP-MPAQ). The objectives of the LAX MP-MPAQ are to reduce emissions associated with implementation of the LAX Master Plan to levels equal to, or less than, the thresholds of significance identified in the LAX Master Plan Final EIR and, at a minimum, to reduce construction, transportation, and operational emissions associated with implementation of the LAX Master Plan to the mitigated levels identified in the Addendum to the Final EIR and the MMRP. It would accomplish these objectives through the use of technologically/legally feasible and economically reasonable methods to reduce emissions both on and off the airport. The LAX MP-MPAQ consists of four components: MM-AQ-1 (*Framework*), MM-AQ-2 (*Construction-Related Mitigation Measures*), MM-AQ-3 (*Transportation-Related Mitigation Measures*), and MM-AQ-4 (*Operations-Related Mitigation Measures*). These four components are described further below. The following provides a summary of LAX Master Mitigation Measures MM-AQ-1, MM-AQ-2, MM-AQ-3, and MM-AQ-4; the full text of these mitigation measures is included in the LAX Master Plan MMRP available at www.ourlax.org.

- **LAX Master Plan - Mitigation Plan for Air Quality; MM-AQ-1, Framework.**

  This measure provides the basic organizational structure for the full LAX MP-MPAQ. It is also intended to furnish LAWA with a clear, consistent, and convenient foundation for the implementation of the plan. With the Framework's "overarching" configuration, the individual components of the LAX

MP-MPAQ (i.e., MM-AQ-2, Construction-Related Mitigation Measures; MM-AQ-3, Transportation-Related Mitigation Measures; and MM-AQ-4, Operations-Related Mitigation Measures) will be better coordinated and completed. The Framework contains the basis and background information for the LAX MP-MPAQ; it identifies the roles and responsibilities of the lead agency, its consultants and contractors; and outlines the approach for monitoring the progress of the plan. Other relevant information in the Framework includes the overall LAX Master Plan and LAX MP-MPAQ schedules, contact information and other supporting materials. MM-AQ-1 is complete and was adopted by the Board of Airport Commissioners in December 2005,[94] and its policies and procedures would apply to all SPAS alternatives.

- **LAX Master Plan - Mitigation Plan for Air Quality; MM-AQ-2, Construction-Related Mitigation Measures.**

  This measure describes numerous specific actions to reduce fugitive dust emissions and exhaust emissions from on-road and off-road mobile and stationary sources used in construction. As discussed in the MMRP and Section 4.6.8 of the LAX Master Plan Final EIR, the LAX Master Plan did not quantify potential emission reductions associated with all of the mitigation measures that fall under MM-AQ-2. Emission reduction measures that were quantified and included in the mitigated emissions inventory presented in Section 4.6.8.5 of the LAX Master Plan Final EIR are described in **Table 4.2-7**. For the LAX SPAS air quality analysis, it was assumed that these mitigation measures would be in place for all LAX SPAS-related construction. Some components of MM-AQ-2 are not readily quantifiable, but would be implemented as part of LAX SPAS. These mitigation strategies, presented in **Table 4.2-8**, are expected to further reduce construction-related emissions associated with LAX SPAS. MM-AQ-2 is complete and was adopted by the Board of Airport Commissioners in December 2005,[95] and the mitigation elements presented in these tables would apply to all SPAS alternatives where construction is required. Other feasible mitigation measures may be adopted.

Table 4.2-7

Construction-Related Mitigation Measures Incorporated into Construction Emissions Inventories

Mitigation Measure	Potential Emissions Reduction by Equipment
Heavy Duty Diesel (Off-road)	
Particulate Traps (where technologically feasible)	85% PM10 and 85% PM2.5, adjusted for compatibility
Fugitive dust caused by on- and off-site vehicle trips	
Watering (per SCAQMD Rule 403)	50% PM10 and 50% PM2.5

Source: CDM Smith, 2012.

94 City of Los Angeles, Los Angeles World Airports, LAX Master Plan Mitigation Plan for Air Quality (MPAQ), MM-AQ-1: Framework, prepared by URS Corp. and KB Environmental Sciences, Inc., October 2005.

95 City of Los Angeles, Los Angeles World Airports, LAX Master Plan Mitigation Plan for Air Quality (MPAQ), MM-AQ-2: Construction-Related Mitigation Measures, prepared by URS Corp. and KB Environmental Sciences, Inc., October 2005.

Table 4.2-8

Construction-Related Air Quality Mitigation Measures Not Quantified in the Construction Emissions Inventories

Measure	Type of Measure
Post a publicly visible sign with the telephone number and person to contact regarding dust complaints; this person shall respond and take corrective action within 24 hours.	Fugitive Dust
Prior to final occupancy, the applicant demonstrates that all ground surfaces are covered or treated sufficiently to minimize fugitive dust emissions.	Fugitive Dust
All roadways, driveways, sidewalks, etc., being installed as part of the project should be completed as soon as possible; in addition, building pads should be laid as soon as possible after grading.	Fugitive Dust
Pave all construction access roads at least 100 feet on to the site from the main road.	Fugitive Dust
To the extent feasible, have construction employees' work/commute during off-peak hours.	On-Road Mobile
Make available on-site lunch trucks during construction to minimize off-site worker vehicle trips.	On-Road Mobile
Prohibit staging and parking of construction vehicles (including workers' vehicles) on streets adjacent to sensitive receptors such as schools, daycare centers, and hospitals.	Nonroad Mobile
Prohibit construction vehicle idling in excess of ten minutes.	Nonroad Mobile
Utilize on-site rock crushing facility, when feasible, during construction to reuse rock/concrete and minimize off-site truck haul trips.	Nonroad Mobile
Specify combination of electricity from power poles and portable diesel- or gasoline-fueled generators using "clean burning diesel" fuel and exhaust emission controls.	Stationary Point Source Controls
Suspend use of all construction equipment during a second-stage smog alert in the immediate vicinity of LAX.	Mobile and Stationary
Utilize construction equipment having the minimum practical engine size (i.e., lowest appropriate horsepower rating for intended job).	Mobile and Stationary
Require that all construction equipment working on-site is properly maintained (including engine tuning) at all times in accordance with manufacturers' specifications and schedules.	Mobile and Stationary
Prohibit tampering with construction equipment to increase horsepower or to defeat emission control devices.	Mobile and Stationary
The contractor or builder shall designate a person or persons to ensure the implementation of all components of the construction-related measure through direct inspections, record reviews, and investigations of complaints.	Administrative

Source: CDM Smith, 2012.

- **LAX Master Plan - Mitigation Plan for Air Quality; MM-AQ-3, Transportation-Related Mitigation Measures.**

  This measure applies to mass transit, surface traffic, and on-site parking facilities. The principal feature of MM-AQ-3 is to replicate and expand the current LAX FlyAway service to other communities within regions of Los Angeles County. This initiative also includes a public outreach program to encourage the use of both the existing and new facilities. For the mitigated emissions inventory presented in Section 4.6.8.5 of the LAX Master Plan Final EIR, only emissions reductions associated with the new FlyAway capacity were quantified to account for the ensuing decrease in VMT region-wide combined with less traffic congestion in the vicinity of the airport and the use of clean-fueled buses used in FlyAway service. The remaining, secondary, transportation-related air quality mitigation measures contained in MM-AQ-3 may also be implemented to help ensure the emission reduction goals of the LAX Master Plan Final EIR and MMRP are achieved. It should be noted that no estimate of the air quality benefit (i.e., emission reductions) was made in the LAX Master Plan Final EIR for these remaining, secondary transportation-related measures. These mitigation strategies, presented in **Table 4.2-9**, are expected to reduce further the transportation-related emissions associated with the LAX SPAS alternatives. Other transportation-related air quality mitigation measures that are found to be equally feasible and practical, but that were not specifically identified in the MMRP, may also be considered. The elements of MM-AQ-3 would apply to all SPAS alternatives that include ground access components, and LAWA would complete preparation of MM-AQ-3 prior to the commencement of implementing any SPAS alternative.

Table 4.2-9

Transportation-Related Air Quality Mitigation Measures

Measure	Type of Measure
Construct on-site or off-site bus turnouts, passenger benches, or shelters to encourage transit system use	Transit Ridership
Construct on-site or off-site pedestrian improvements, including showers for pedestrian employees to encourage walking/bicycling to work by LAX employees	Transit Ridership
Link Intelligent Transportation Systems (ITS) with off-airport parking facilities with ability to divert/direct trips to these facilities to reduce traffic/parking congestion and the associated air emissions in the immediate vicinity of the airport	Highway/Roadway Improvements
Expand ITS and Adaptive Traffic Control Systems (ATCS), concentrating on I-405 and I-105 corridors, extending into South Bay and Westside surface street corridors to reduce traffic/parking congestion and associated air emissions in the immediate vicinity of the airport	Highway/Roadway Improvements
Link LAX traffic management system with airport cargo facilities, with ability to re-route cargo trips to/from these facilities to reduce traffic/parking congestion and associated air emissions in the immediate vicinity of the airport	Highway/Roadway Improvements
Develop a program to minimize use of conventional-fueled fleet vehicles during smog alerts to reduce air emissions from vehicles at the airport	Highway/Roadway Improvements
Provide free parking and preferential parking locations for ultra low emission vehicles/super low emission vehicles/zero emission vehicles (ULEV/SULEV/ZEV) in all (including employee) LAX lots; provide free charging stations for ZEV; include public outreach to reduce air emissions from automobiles accessing airport parking	Parking
Develop measures to reduce air emissions of vehicles in line to exit parking lots such as pay-on-foot (before getting into car) to minimizing idle time at parking check out, including public outreach	Parking

Table 4.2-9

Transportation-Related Air Quality Mitigation Measures

Measure	Type of Measure
Implement on-site circulation plan in parking lots to reduce time and associated air emissions from vehicles circulating through lots looking for parking	Parking
Encourage video conferencing capabilities at various locations on the airport to reduce off-site local business travel and associated VMT and air emissions in the vicinity of the airport	Parking
Expand LAWA's rideshare program to include all airport tenants	Additional Ridership
Promote commercial vehicles/trucks/vans using terminal areas (LAX and regional intermodal) to install SULEV/ZEV engines to reduce vehicle air emissions	Clean Vehicle Fleets
Promote "best-engine" technology for rental cars using on-airport rent-a-car facilities to reduce vehicle air emissions	Clean Vehicle Fleets
Consolidate non-rental car shuttles using SULEV/ZEV engines to reduce vehicle air emissions	Clean Vehicle Fleets
Cover, if feasible, any parking structures that receive direct sunlight, to reduce volatile emissions from vehicle gasoline tanks; and install solar panels on these roofs where feasible to supply electricity or hot water to reduce power production demand and associated air emissions at utility plants	Energy Conservation

Source: CDM Smith, 2012.

- **LAX Master Plan - Mitigation Plan for Air Quality; MM-AQ-4, Operations-Related Mitigation Measures.**

  Consistent with the LAX Master Plan Final EIR and the MMRP, the principle feature of this measure is the conversion of LAX GSE to low and ultra-low emission technology (e.g., electric, fuel cell, and other future low-emission technologies), and emissions reductions associated with this measure were quantified in the LAX Master Plan Final EIR to account for emissions that would otherwise be generated from the combustion of fossil fuels in GSE. Both LAWA- and tenant-owned equipment would be included in this conversion program which would be implemented in phases and completed at the build-out of the LAX Master Plan projects. LAWA would assign a GSE coordinator whose responsibilities it would be to ensure the successful conversion of GSE in a timely manner. This coordinator must have adequate authority to negotiate on behalf of the City and have sufficient technical support to evaluate technical issues that arise during the implementation of this measure. Other operations-related air quality mitigation measures that are found to be equally feasible and practical, but that were not specifically identified in the MMRP, may also be considered. MM-AQ-4 would apply to all SPAS alternatives that include airport operations components, and LAWA would complete preparation of MM-AQ-4 prior to the commencement of implementing any SPAS alternative.

Additionally, the LAX Master Plan Community Benefits Agreement (CBA) and Settlement Agreement include several air quality mitigation measures applicable to LAX Master Plan projects. The following components from Section X, Air Quality, of the CBA would apply to some or all of the SPAS alternatives.

- **LAX Master Plan Community Benefits Agreement; X.A., Electrification of Passenger Gates.**

  This provision requires that all passenger gates newly constructed by LAWA shall be equipped with and able to provide grid electricity to parked aircraft (for lighting and ventilation) from and after the date of initial operation and that LAWA will ensure that all aircraft (unless exempt) use the gate-provided grid electricity in lieu of electricity provided by operation of an auxiliary or ground power unit. This provision would apply in conjunction with construction or modification of passenger gates that occurs as a result of implementing any of the SPAS alternatives, specifically Alternatives 1, 2, 3, 5, 6, and 7.

- **LAX Master Plan Community Benefits Agreement; X.F., Construction Equipment.**

  LAWA shall require that all diesel-fueled equipment used for construction related to the LAX Master Plan Program be outfitted with the best available emission control devices primarily to reduce emissions of diesel particulate matter (PM), including fine PM (PM2.5), and secondarily, to reduce emissions of NO_x. This requirement shall apply to diesel-fueled off-road equipment (such as construction machinery), diesel-fueled on-road vehicles (such as trucks), and stationary diesel-fueled engines (such as electric generators). The emission control devices utilized in construction equipment in the LAX Master Plan Program shall be verified or certified by CARB or USEPA for use in on-road or off-road vehicles or engines. This provision also requires the use of ultra-low sulfur diesel (ULSD) fuel in construction equipment, places limitations on the amount of idling of diesel-fueled engines, requires following manufacturer's engine maintenance recommendations, and an annual reassessment of determinations of what constitutes best available emission control devices. This provision would apply in conjunction with construction that occurs as a result of implementing any of the SPAS alternatives.

- **LAX Master Plan Community Benefits Agreement; X.K., PM2.5.**

  This provision requires LAWA to assess the impacts from the emissions of fine particulate matter (PM2.5) within the context of a CEQA analysis and to mitigate such emissions that exceed applicable thresholds of significance. Since SCAQMD established thresholds of significance for PM2.5 in October 2006, this provision would apply in conjunction with construction and operations that occur as a result of implementing any of the SPAS alternatives.

- **LAX Master Plan Community Benefits Agreement; X.L., Rock-Crushing Operations and Construction Materials Stockpiles.**

  This provision requires LAWA to locate rock-crushing operations and construction material stockpiles for all construction-related to the LAX Master Plan Program in areas away from LAX-adjacent residents to reduce impacts from emissions of fugitive dust. This requirement would be included in specifications for any SPAS alternative requiring on-site construction.

- **LAX Master Plan Community Benefits Agreement; X.M., Limits on Diesel Idling.**

  This provision requires LAWA to prohibit idling or queuing of diesel-fueled vehicles and equipment for more than ten consecutive minutes on-site. This requirement would be included in specifications for any SPAS alternative requiring on-site construction.

- **LAX Master Plan Community Benefits Agreement; X.N., Provision of Alternative Fuel.**

  This provision requires LAWA to make sure that there is available and sufficient infrastructure on-site, where not operationally or technically infeasible, to provide fuel to alternative-fueled vehicles to meet all requests for alternative fuels from contractors and other users of LAX. This would apply not only to construction equipment but to operations-related vehicles on-site. This provision would apply in conjunction with construction or modification of passenger gates that occurs as a result of implementing any of the SPAS alternatives to provide appropriate infrastructure for electric GSE.

4.2.6 Impacts Analysis

4.2.6.1 Construction Emissions

Peak daily construction emissions for Alternatives 1 through 9 are presented in **Table 4.2-10**. To provide a more representative basis of comparison between all nine alternatives, the emissions of those alternatives that focus solely on airfield and related terminal improvements (Alternatives 5, 6, and 7) were combined with the range of emissions that could occur under various ground access improvements scenarios. Similarly, the emissions of those alternatives that focus solely on ground access improvements (i.e., Alternatives 8 and 9) were combined with the range of emissions that could occur under various airfield/terminal improvements scenarios -- see Notes 2 and 3 in **Table 4.2-10**. In so doing, the total potential emissions associated with these focused alternatives can be better compared to the emissions associated with the "fully integrated" alternatives (i.e., Alternatives 1 through 4, which consider airfield, terminal, and ground access improvements within each alternative).

4.2.6.1.1 Alternative 1

Table 4.2-10 presents the peak daily criteria pollutant emissions associated with construction of Alternative 1.

As indicated in **Table 4.2-10**, the vast majority (over 85 percent) of the construction emissions for Alternative 1 would be associated with the airfield and terminal improvements. Such improvements include moving Runway 6L/24R 260 feet north and completing related improvements such as covering the Argo Drainage Channel and realigning Lincoln Boulevard, lengthening Runways 6L/24R and 6R/24L, various taxiway and taxilane improvements, and terminal improvements. Of the nine alternatives, construction emissions associated with Alternative 1 would be the third highest, following Alternatives 3 and 5.

Under Alternative 1, peak daily emissions of SO_2 would not exceed the SCAQMD construction emission thresholds; however, peak daily emissions of CO, VOC, NO_x, PM10, and PM2.5 would exceed the SCAQMD construction emissions thresholds. Therefore, Alternative 1 construction emissions of CO, VOC, NO_x, PM10, and PM2.5 would be significant.

4.2.6.1.2 Alternative 2

Table 4.2-10 presents the peak daily criteria pollutant emissions associated with construction of Alternative 2.

As indicated in **Table 4.2-10**, most (approximately 65-70 percent) of the emissions for Alternative 2 are associated with airfield improvements; however, given the relatively limited nature of such improvements (i.e., taxiway improvements, the lengthening of Runway 6R/24L, and terminal improvements) as compared to the other SPAS alternatives, the total construction emissions of Alternative 2 would be the second lowest of the nine alternatives. Only Alternative 4, with its minimal improvements, would have lower construction emissions than Alternative 2.

Under Alternative 2, peak daily emissions of SO_2 would not exceed the SCAQMD construction emission thresholds; however, peak daily emissions of CO, VOC, NO_x, PM10, and PM2.5 would exceed the SCAQMD construction emissions thresholds. Therefore, Alternative 2 construction emissions of CO, VOC, NO_x, PM10, and PM2.5 would be significant.

4.2.6.1.3 Alternative 3

Table 4.2-10 presents the peak daily criteria pollutant emissions associated with construction of Alternative 3.

As indicated in **Table 4.2-10**, the proportions of airfield/terminal-related construction emissions and ground access-related construction emissions would be more balanced (i.e., closer to 60 percent/40 percent) than those of the other alternatives; however, this is due to the fact that Alternative 3 involves substantially more ground access improvements than any of the other alternatives. Alternative 3 would require demolishing the CTA parking structures; building new parking/transportation facilities, interconnecting roadways, and an APM along the eastern airport boundaries; moving Runway 6R/24L and implementing extensive taxiway modifications; and rebuilding the northern concourse area in CTA. Given the substantial nature of such an improvement program, the construction emissions from Alternative 3 would be the highest of any of the nine alternatives.

Table 4.2-10

Peak Daily Construction Emissions

Pollutant/ Source[1]	Alt. 1 lbs/day	Alt. 2 lbs/day	Alt. 3 lbs/day	Alt. 4 lbs/day	Alt. 5[2] lbs/day	Alt. 6[2] lbs/day	Alt. 7[2] lbs/day	Alt. 8[3] lbs/day	Alt. 9[3] lbs/day
CO									
Airfield/Terminal Construction	1,233	380	1,067	54	1,388	1,071	909	380-1,388	380-1,388
Ground Access Construction	188	188	802	137	188-281	188-281	188-281	237	281
Grand Total	1,422	568	1,869	191	1,576-1,669	1,259-1,352	1,097-1,190	617-1,625	661-1,669
Threshold	550	550	550	550	550	550	550	550	550
Significant?	**Yes**	**Yes**	**Yes**	**No**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
VOC									
Airfield/Terminal Construction	259	79	223	11	291	225	191	79-291	79-291
Ground Access Construction	37	37	146	27	37-54	37-54	37-54	46	54
Grand Total	296	117	369	39	328-344	262-279	228-245	125-337	133-345
Threshold	75	75	75	75	75	75	75	75	75
Significant?	**Yes**	**Yes**	**Yes**	**No**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
NO_x									
Airfield/Terminal Construction	2,926	906	2,555	127	3,290	2,542	2,156	906-3,290	906-3,290
Ground Access Construction	492	492	2,210	381	492-757	492-757	492-757	634	757
Grand Total	3,418	1,399	4,765	509	3,782-4,047	3,034-3,299	2,648-2,913	1,540-3,924	1,663-4,047
Threshold	100	100	100	100	100	100	100	100	100
Significant?	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
SO_2									
Airfield/Terminal Construction	3.4	1.1	3.0	0.2	3.8	3.0	2.5	1.1-3.8	1.1-3.8
Ground Access Construction	0.6	0.6	2.3	0.4	0.6-0.8	0.6-0.8	0.6-0.8	0.7	0.8
Grand Total	4.0	1.6	5.3	0.6	4.4-4.6	3.6-3.8	3.1-3.3	1.8-4.5	1.9-4.6
Threshold	150	150	150	150	150	150	150	150	150
Significant?	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**
PM10									
Airfield/Terminal Construction	1,441	452	1,285	62	1,618	1,252	1,063	452-1,618	452-1,618
Ground Access Construction	186	186	671	159	186-270	186-270	186-270	240	270
Grand Total	1,627	638	1,956	222	1,804-1,888	1,438-1,522	1,249-1,333	692-1,858	722-1,888
Threshold	150	150	150	150	150	150	150	150	150
Significant?	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**

Table 4.2-10

Peak Daily Construction Emissions

Pollutant/ Source[1]	Alt. 1 lbs/day	Alt. 2 lbs/day	Alt. 3 lbs/day	Alt. 4 lbs/day	Alt. 5[2] lbs/day	Alt. 6[2] lbs/day	Alt. 7[2] lbs/day	Alt. 8[3] lbs/day	Alt. 9[3] lbs/day
PM2.5									
Airfield/Terminal Construction	219	68	193	10	246	190	161	68-246	68-246
Ground Access Construction	30	30	116	24	30-44	30-44	30-44	39	44
Grand Total	249	98	309	34	276-290	220-234	191-205	107-285	112-290
Threshold	55	55	55	55	55	55	55	55	55
Significant?	**Yes**	**Yes**	**Yes**	**No**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**

1 Totals may not add exactly due to rounding.

2 Alternatives 5 through 7 focus primarily on airfield improvements and related terminal and roadway improvements. Those improvements are compatible with the ground access improvements proposed under Alternatives 1, 2, 8, and 9. The emissions presented relative construction of airfield and terminal improvements under Alternatives 1, 2, 5, 6, and 7 are specific to characteristics of each of these alternatives; however, the non-airfield construction emissions (i.e., roadways, parking, stationary, and off-airport) shown for Alternatives 5 through 7 reflect the range of those types of emissions for Alternatives 1, 2, 8, and 9. The total emissions for Alternatives 5 through 7 would fall within the range shown for each, depending on which set of ground access improvements is assumed. The emissions presented relative to both airfield and non-airfield construction activity for Alternatives 3 and 4 are specific to the characteristics of each of these alternatives, which still provide a basis for comparison with the other alternatives.

3 Alternatives 8 and 9 focus primarily on ground access improvements; however, those improvements are compatible with the airfield improvements, and related terminal and roadway improvements, proposed under Alternatives 1, 2, 5, 6, and 7. The emissions presented relative to construction of non-airfield improvements (i.e., roadways, parking, stationary, and off-airport) under Alternatives 1, 2, 8, and 9 are specific to characteristics of each of these alternatives; however, the construction-related airfield/terminal improvements emissions shown for Alternatives 8 and 9 reflect the range of those types of emissions for Alternatives 1, 2, 5, 6, and 7. The total emissions for Alternatives 8 and 9 would fall within the range shown for each, depending on which set of airfield improvements is assumed. The emissions presented relative to both airfield and non-airfield construction activity for Alternatives 3 and 4 are specific to the characteristics of each of these alternatives, which still provide a basis for comparison with the other alternatives.

Sources: Environmental Compliance Solutions, 2012; CDM Smith, 2012.

Under Alternative 3, peak daily emissions of SO_2 would not exceed the SCAQMD construction emission thresholds; however, peak daily emissions of CO, VOC, NO_x, PM10, and PM2.5 would exceed the SCAQMD construction emissions thresholds. Therefore, Alternative 3 construction emissions of CO, VOC, NO_x, PM10, and PM2.5 would be significant.

4.2.6.1.4 Alternative 4

Table 4.2-10 presents the peak daily criteria pollutant emissions associated with construction of Alternative 4.

As indicated in **Table 4.2-10**, construction emissions associated with Alternative 4, which proposes minimal improvements, would be substantially lower than those of other alternatives and would be the lowest of all nine.

Under Alternative 4, peak daily emissions of CO, VOC, SO_2, and PM2.5 would not exceed the SCAQMD construction emission thresholds; however, peak daily emissions of NO_x and PM10 would exceed the SCAQMD construction emissions thresholds. Therefore, Alternative 4 construction emissions of NO_x and PM10 would be significant.

4.2.6.1.5 Alternative 5

Table 4.2-10 presents the peak daily criteria pollutant emissions associated with construction of Alternative 5.

As indicated in **Table 4.2-10**, the vast majority (approximately 80-90 percent) of the construction emissions for Alternative 5 would be associated with the airfield and terminal improvements, for essentially the same reasons as described above for Alternative 1. The only other alternative with higher construction emissions would be Alternative 3, with its extensive ground access and terminal improvements along with substantial airfield improvements.

Under Alternative 5 (when paired with ground access improvements), peak daily emissions of SO_2 would not exceed the SCAQMD construction emission thresholds. Peak daily emissions of CO, VOC, NO_x, PM10, and PM2.5 would exceed the SCAQMD construction emissions thresholds. Therefore, Alternative 5 construction emissions of CO, VOC, NO_x, PM10, and PM2.5 would be significant.

4.2.6.1.6 Alternative 6

Table 4.2-10 presents the peak daily criteria pollutant emissions associated with construction of Alternative 6.

As indicated in **Table 4.2-10**, construction emissions associated with Alternative 6 would be primarily (about 80-85 percent) from the airfield and terminal improvements.

Under Alternative 6 (when paired with ground access improvements), peak daily emissions of SO_2 would not exceed the SCAQMD construction emission thresholds. Peak daily emissions of CO, VOC, NO_x, PM10, and PM2.5 would exceed the SCAQMD construction emissions thresholds. Therefore, Alternative 6 construction emissions of CO, VOC, NO_x, PM10, and PM2.5 would be significant.

4.2.6.1.7 Alternative 7

Table 4.2-10 presents the peak daily criteria pollutant emissions associated with construction of Alternative 7.

As indicated in **Table 4.2-10**, construction emissions associated with Alternative 7 would be primarily (about 75-85 percent) from the airfield and terminal improvements.

Under Alternative 7 (when paired with ground access improvements), peak daily emissions of SO_2 would not exceed the SCAQMD construction emission thresholds. Peak daily emissions of CO, VOC, NO_x, PM10, and PM2.5 would exceed the SCAQMD construction emissions thresholds. Therefore, Alternative 7 construction emissions of CO, VOC, NO_x, PM10, and PM2.5 would be significant.

4.2.6.1.8 Alternative 8

Table 4.2-10 presents the peak daily criteria pollutant emissions associated with construction of Alternative 8.

Alternative 8 focuses on ground access improvements, offering a variation to the ground access system proposed under Alternatives 1 and 2. In looking at the construction emissions specific to ground access improvements, the emissions under Alternative 8 would be approximately 20-30 percent greater than those of the ground access improvements under Alternatives 1 and 2.

Under Alternative 8 (when paired with airfield and terminal improvements), peak daily emissions of SO_2 would not exceed the SCAQMD construction emission thresholds. Peak daily emissions of CO, VOC, NO_x, PM10, and PM2.5 would exceed the SCAQMD construction emissions thresholds. Therefore, Alternative 8 construction emissions of CO, VOC, NO_x, PM10, and PM2.5 would be significant.

4.2.6.1.9 Alternative 9

Table 4.2-10 presents the peak daily criteria pollutant emissions associated with construction of Alternative 9.

Similar to Alternative 8, Alternative 9 focuses on ground access improvements, offering a variation to the ground access system proposed under Alternatives 1 and 2. In looking at the construction emissions specific to ground access improvements, the emissions under Alternative 9 would be approximately 45-55 percent greater than those of the ground access improvements under Alternatives 1 and 2.

Under Alternative 9 (when paired with airfield and terminal improvements), peak daily emissions of SO_2 would not exceed the SCAQMD construction emission thresholds. Peak daily emissions of CO, VOC, NO_x, PM10, and PM2.5 would exceed the SCAQMD construction emissions thresholds. Therefore, Alternative 9 construction emissions of CO, VOC, NO_x, PM10, and PM2.5 would be significant.

4.2.6.2 Construction Concentrations

Ambient concentrations resulting from construction-related activities for Alternatives 1 through 9 are presented in **Tables 4.2-11** and **4.2-12**. **Table 4.2-11** addresses CO, NO_2, and SO_2, for which the applicable thresholds of significance require the inclusion of background concentrations (see **Table 4.2-6**), and **Table 4.2-12** addresses PM10 and PM2.5, which include only the project-related concentrations, without background concentrations, pursuant to the applicable thresholds of significance (see **Table 4.2-6**). It should be noted that the concentrations for Alternatives 5 through 9 are expressed as ranges, based on the potential for the types of improvements particular to each alternative to be combined with other types of improvements (i.e., potential combinations of airfield/terminal improvements and ground access improvements), resulting in the ranges of construction emissions presented above in **Table 4.2-10** -- see explanation in the introduction to Section 4.2.6.1.

4.2.6.2.1 Alternative 1

As shown in **Table 4.2-11**, construction concentrations for Alternative 1 would exceed the 1-hour NO_2 CAAQS and NAAQS. In addition, PM10 concentrations would exceed the 24-hour and annual CEQA thresholds set by SCAQMD, as shown in **Table 4.2-12**. Therefore, Alternative 1 construction concentrations would be significant for NO_2 and PM10. Alternative 1 construction concentrations would be less than significant for CO, SO_2, and PM2.5. As with the construction emissions, Alternative 1 concentrations from construction would be lower than those for Alternatives 3 and 5, and greater than those from Alternatives 2, 4, 6, and 7.

Off-airport peak NO_2 construction-related concentrations are estimated to occur at the western property line of the airport north of the Hyperion Treatment Plant, based on the assumption that much of the construction support equipment/operations would occur in the western portion of the airport south of World Way West, as has been the case for several major construction projects at LAX, such as the South Airfield Improvement Project, the Crossfield Taxiway Project, and the Bradley West Project. Key construction support equipment/operations are assumed to include a concrete/asphalt batch plant(s) and rock crusher, and associated equipment such as loaders and concrete/materials transfer trucks, and construction delivery/haul staging. These facilities and activities would contribute the majority of the NO_2 emissions that drive the peak emissions, while the NO_2 emissions associated with overall construction activities in the north airfield (i.e., runway and taxiway improvements) would be a secondary contributor to the peak NO_2 concentrations.

The peak 24-hour and annual PM10 concentrations are estimated to occur just east of the CTA, near the intersection of Century Boulevard and Sepulveda Boulevard. The sources contributing to this peak concentration would include the construction of the proposed elevated/dedicated busway (approximately 42 percent of the emissions), north airfield improvements (21 percent) and north concourse improvements along with the bridge and roadway modifications at the entrance to the CTA (16 percent).

4.2.6.2.2 Alternative 2

As shown in **Table 4.2-11**, construction concentrations for Alternative 2 would exceed the 1-hour NO_2 CAAQS and NAAQS. In addition, PM10 concentrations would exceed the 24-hour and annual CEQA thresholds set by SCAQMD, as shown in **Table 4.2-12**. Therefore, Alternative 2 construction concentrations would be significant for NO_2 and PM10. Alternative 2 construction concentrations would be less than significant for CO, SO_2, and PM2.5. Of the nine alternatives, Alternative 2 would have the second lowest construction concentrations; only Alternative 4 would have lower concentrations from construction.

The general locations of the peak 1-hour NO_2 concentration and peak 24-hour and annual PM10 concentrations under Alternative 2 would be similar to those described above for Alternative 1, with the primary sources contributing to those peaks also being essentially the same as described above, although the concentration levels of Alternative 2 would be lower than those of Alternative 1.

4.2.6.2.3 Alternative 3

As shown in **Table 4.2-11**, construction concentrations for Alternative 3 would exceed the 1-hour NO_2 CAAQS and NAAQS. In addition, PM10 concentrations would exceed the 24-hour and annual CEQA thresholds set by SCAQMD, as shown in **Table 4.2-12**. Therefore, Alternative 3 construction concentrations would be significant for NO_2 and PM10. Alternative 3 construction concentrations would be less than significant for CO, SO_2, and PM2.5. As with construction emissions, the construction concentrations from Alternative 3 would be the highest of any of the alternatives.

The location of the highest 1-hour NO_2 concentration (used for comparison with the CAAQS) would be near the corner of Sepulveda Boulevard and 96th Street. The activities that would be the primary contributors to this peak concentration include the north terminal improvements (22 percent), north airfield improvements (15 percent), Consolidated Rental Car Facility (CONRAC) construction (14 percent), CTA reconstruction (14 percent), and APM construction (13 percent).

The location of the eighth highest 1-hour NO_2 concentration (used for comparison with the NAAQS) would be near the corner of Aviation Boulevard and Century Boulevard. This peak concentration would be between the proposed Ground Transportation Center (GTC) and Intermodal Transportation Center (ITC), near the new eastside airport roadways and APM that would connect these new parking facilities. The activities that would be the primary contributors to this peak concentration include the eastside roadway construction (53 percent), GTC construction (23 percent), and APM construction (20 percent).

The peak 24-hour and annual PM10 concentrations would be in the CTA. The activities that would be the primary contributors to these peak concentrations include the CTA reconstruction (42 to 73 percent), north terminal improvements (16 to 27 percent), and north airfield improvements (3 to 11 percent).

Table 4.2-11

Peak Construction Concentrations for CO, NO_2, and SO_2

Pollutant/ Source[1]	Averaging Period	Alt. 1 ($\mu g/m^3$)	Alt. 2 ($\mu g/m^3$)	Alt. 3 ($\mu g/m^3$)	Alt. 4 ($\mu g/m^3$)	Alt. 5[2] ($\mu g/m^3$)	Alt. 6[2] ($\mu g/m^3$)	Alt. 7[2] ($\mu g/m^3$)	Alt. 8[3] ($\mu g/m^3$)	Alt. 9[3] ($\mu g/m^3$)
CO	CAAQS									
Alternative	1-Hour	646	396	856	176	726-734	560-570	480-508	410-730	440-734
Background	1-Hour	4,581	4,581	4,581	4,581	4,581	4,581	4,581	4,581	4,581
Total	1-Hour	5,227	4,977	5,437	4,757	5,307-5,315	5,141-5,151	5,061-5,089	4,991-5,311	5,021-5,315
Threshold[4]	1-Hour	23,000	23,000	23,000	23,000	23,000	23,000	23,000	23,000	23,000
Significant?	1-Hour	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**
	CAAQS/NAAQS									
Alternative	8-Hour	452	278	600	124	508-514	394-400	336-356	286-510	308-514
Background	8-Hour	2,897	2,897	2,897	2,897	2,897	2,897	2,897	2,897	2,897
Total	8-Hour	3,349	3,175	3,497	3,021	3,405-3,411	3,291-3,297	3,233-3,253	3,183-3,407	3,205-3,411
Threshold[5]	8-Hour	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000
Significant?	8-Hour	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**
NO_2	CAAQS									
Alternative	1-Hour	998	494	1,468	358	1,120-1,138	870-888	746-764	620-1,126	700-1,138
Background	1-Hour	177	177	177	177	177	177	177	177	177
Total	1-Hour	1,175	671	1,645	535	1,297-1,315	1,047-1,065	923-941	797-1,303	877-1,315
Threshold[6]	1-Hour	339	339	339	339	339	339	339	339	339
Significant?	1-Hour	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
	NAAQS									
Alternative	1-Hour	824	348	932	288	924-938	718-730	612-626	424-932	506-938
Background	1-Hour	76	76	76	76	76	76	76	76	76
Total	1-Hour	900	424	1,008	364	1,000-1,014	794-806	688-702	500-1,008	582-1,014
Threshold[7]	1-Hour	188	188	188	188	188	188	188	188	188
Significant?	1-Hour	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
	CAAQS									
Alternative	Annual	8	8	17	4	8-9	8-9	8-9	9	9
Background	Annual	26	26	26	26	26	26	26	26	26
Total	Annual	34	34	43	30	34-35	34-35	34-35	35	35
Threshold[8]	Annual	57	57	57	57	57	57	57	57	57
Significant?	Annual	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**
SO_2	CAAQS									
Alternative	1-Hour	2	2	2	<0.5	2	2	2	2	2
Background	1-Hour	65	65	65	65	65	65	65	65	65
Total	1-Hour	67	67	67	65	67	67	67	67	67
Threshold[9]	1-Hour	655	655	655	655	655	655	655	655	655
Significant?	1-Hour	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**

Table 4.2-11

Peak Construction Concentrations for CO, NO_2, and SO_2

Pollutant/ Source[1]	Averaging Period	Alt. 1 (µg/m³)	Alt. 2 (µg/m³)	Alt. 3 (µg/m³)	Alt. 4 (µg/m³)	Alt. 5[2] (µg/m³)	Alt. 6[2] (µg/m³)	Alt. 7[2] (µg/m³)	Alt. 8[3] (µg/m³)	Alt. 9[3] (µg/m³)
	NAAQS									
Alternative	1-Hour	2	2	2	<0.5	2	2	2	2	2
Background	1-Hour	37	37	37	37	37	37	37	37	37
Total	1-Hour	39	39	39	37	39	39	39	39	39
Threshold[10]	1-Hour	196	196	196	196	196	196	196	196	196
Significant?	1-Hour	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**
	CAAQS									
Alternative	24-Hour	0.2	<0.05	0.2	<0.05	0.2	0.2	0.2	0.2	0.2
Background	24-Hour	16	16	16	16	16	16	16	16	16
Total	24-Hour	16	16	16	16	16	16	16	16	16
Threshold[11]	24-Hour	105	105	105	105	105	105	105	105	105
Significant?	24-Hour	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**

1 The significance thresholds for CO, NO_2, and SO_2 are based on California and/or National Ambient Air Quality Standards (CAAQS and/or NAAQS) which are absolute thresholds. Therefore, future operational concentrations are determined by adding existing background concentrations to the calculated future airport-related concentrations under a given alternative for comparison to the thresholds.

2 Alternatives 5 through 7 focus primarily on airfield improvements and related terminal and roadway improvements. Those improvements are compatible with the ground access improvements proposed under Alternatives 1, 2, 8, and 9. The range of peak concentrations presented for Alternatives 5 through 7 include the concentrations associated with construction of the alternative-specific airfield/terminal improvements plus the range of concentrations associated with construction of different ground access options under Alternatives 1, 2, 8, or 9. The total concentrations for Alternatives 5 through 7 would fall within the range shown for each depending on which set of ground access improvements is assumed.

3 Alternatives 8 and 9 focus primarily on ground access improvements; however, those improvements are compatible with the airfield improvements, and related terminal and roadway improvements, proposed under Alternatives 1, 2, 5, 6, and 7. The range of peak concentrations presented for Alternatives 8 and 9 include the concentrations associated with construction of the alternative-specific ground access improvements plus the range of concentration associated with construction of different airfield/terminal options under Alternatives 1, 2, 5, 6, or 7. The total concentrations for Alternatives 8 and 9 would fall within the range shown for each depending on which set of airfield improvements is assumed.

4 The 1-Hour CO threshold is the 1-Hour CO CAAQS since this standard is more stringent than the 1-Hour CO NAAQS.

5 The 8-Hour CO threshold is equivalent to both the 8-Hour CO CAAQS and 8-Hour CO NAAQS.

6 The 1-Hour NO_2 CAAQS is not exceeded.

7 The 1-Hour NO_2 NAAQS is based on the 3-year average of the 98th percentile of daily maximum 1-hour concentrations.

8 The annual NO_2 threshold is the annual NO_2 CAAQS since this standard is more stringent than the annual NO_2 NAAQS.

9 The 1-Hour SO_2 CAAQS is not exceeded.

10 The 1-Hour SO_2 NAAQS is based on the 3-year average of the 99th percentile of daily maximum 1-hour concentrations.

11 The 1-Hour SO_2 CAAQS is not exceeded.

Source: CDM Smith, 2012.

Table 4.2-12

Peak Construction Concentrations for PM10 and PM2.5

Pollutant/ Source[1]	Averaging Period	Alt. 1 (μg/m³)	Alt. 2 (μg/m³)	Alt. 3 (μg/m³)	Alt. 4 (μg/m³)	Alt. 5[2] (μg/m³)	Alt. 6[2] (μg/m³)	Alt. 7[2] (μg/m³)	Alt. 8[3] (μg/m³)	Alt. 9[3] (μg/m³)
PM10										
Alternative	24-Hour	38	28	50	16	40-42	36-38	34-36	30-40	30-42
Threshold	24-Hour	10.4	10.4	10.4	10.4	10.4	10.4	10.4	10.4	10.4
Significant?	24-Hour	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
Alternative	Annual	4	4	6	2	4	4	4	4	4
Threshold	Annual	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Significant?	Annual	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
PM2.5										
Alternative	24-Hour	6	4	8	2	6	6	6	4-6	4-6
Threshold	24-Hour	10.4	10.4	10.4	10.4	10.4	10.4	10.4	10.4	10.4
Significant?	24-Hour	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**

[1] The significance thresholds for PM10 and PM2.5 are based on project incremental thresholds developed by SCAQMD. Therefore, future construction concentrations are the values under a given alternative to be compared to the thresholds.

[2] Alternatives 5 through 7 focus primarily on airfield improvements and related terminal and roadway improvements. Those improvements are compatible with the ground access improvements proposed under Alternatives 1, 2, 8, and 9. The range of peak concentrations presented for Alternatives 5 through 7 include the concentrations associated with construction of the alternative-specific airfield/terminal improvements plus the range of concentrations associated with construction of different ground access options under Alternatives 1, 2, 8, or 9. The total concentrations for Alternatives 5 through 7 would fall within the range shown for each depending on which set of ground access improvements is assumed.

[3] Alternatives 8 and 9 focus primarily on ground access improvements; however, those improvements are compatible with the airfield improvements, and related terminal and roadway improvements, proposed under Alternatives 1, 2, 5, 6, and 7. The range of peak concentrations presented for Alternatives 8 and 9 include the concentrations associated with construction of the alternative-specific ground access improvements plus the range of concentration associated with construction of different airfield/terminal options under Alternatives 1, 2, 5, 6, or 7. The total concentrations for Alternatives 8 and 9 would fall within the range shown for each depending on which set of airfield improvements is assumed.

Source: CDM Smith, 2012.

4.2.6.2.4 Alternative 4

As shown in **Table 4.2-11**, construction concentrations for Alternative 4 would exceed the 1-hour NO_2 CAAQS and NAAQS. In addition, PM10 concentrations would exceed the 24-hour and annual CEQA thresholds set by SCAQMD, as shown in **Table 4.2-12**. Therefore, Alternative 4 construction concentrations would be significant for NO_2 and PM10. Alternative 4 construction concentrations would be less than significant for CO, SO_2, and PM2.5. Alternative 4 would have the least amount of construction compared to all other LAX SPAS alternatives; therefore, construction concentrations from Alternative 4 would be the lowest of the alternatives.

The locations of the peak NO_2 and PM10 concentrations would be along 96th Street between Sepulveda Boulevard and Avion Drive. The primary contributor to the peak NO_2 and PM10 concentrations would be construction of the CONRAC northeast of the CTA. This facility would contribute 92 to 98 percent of the peak NO_2 concentrations and over 95 percent of the peak PM10 concentrations.

4.2.6.2.5 Alternative 5

As shown in **Table 4.2-11**, construction concentrations for Alternative 5 would exceed the 1-hour NO_2 CAAQS and NAAQS. In addition, PM10 concentrations would exceed the 24-hour and annual CEQA thresholds set by SCAQMD, as shown in **Table 4.2-12**. Therefore, Alternative 5 construction concentrations would be significant for NO_2 and PM10. Alternative 5 construction concentrations would be less than significant for CO, SO_2, and PM2.5. As with construction emissions, the construction concentrations associated with Alternative 5 would be higher than all other alternatives, except Alternative 3.

The primary contributors to peak NO_2 concentrations would be the construction support facilities/operations assumed to be located on the west side of the airport and the north airfield construction activities. The nature and characteristics of these sources, as related to construction concentrations, are the same as described above for Alternative 1. Under Alternative 5, construction support facilities/operations would contribute between approximately 66 and 84 percent of the peak NO_2 concentrations that would occur along the western property line. North airfield construction would contribute another 8 to 25 percent to the peak NO_2 concentrations.

The peak 24-hour and annual PM10 concentration location would be just east of the CTA near the intersection of Century Boulevard and Sepulveda Boulevard. The sources contributing to this peak concentration would include the construction of the dedicated/elevated busway (43 percent), which is assumed to occur in conjunction with the airfield and terminal improvements under this alternative in order to provide a basis of comparison with the other alternatives, the north airfield improvements (23 percent), and the north concourse improvements along with the bridge and reconfigured entry roadways (14 percent, together).

4.2.6.2.6 Alternative 6

As shown in **Table 4.2-11**, construction concentrations for Alternative 6 would exceed the 1-hour NO_2 CAAQS and NAAQS. In addition, PM10 concentrations would exceed the 24-hour and annual CEQA thresholds set by SCAQMD, as shown in **Table 4.2-12**. Therefore, Alternative 6 construction concentrations would be significant for NO_2 and PM10. Alternative 6 construction concentrations would be less than significant for CO, SO_2, and PM2.5. Alternative 6 construction concentrations would be lower than Alternatives 1, 3, and 5, but higher than Alternatives 2, 4, and 7, similar to the construction emissions.

The primary contributors to peak NO_2 concentrations would be the construction support facilities/operations assumed to be located on the west side of the airport. The nature and characteristics of this source, as related to construction concentrations, are the same as described above for Alternative 1. These facilities/operations would contribute approximately 90 percent to the peak NO_2 concentrations that would occur along the western property line.

The peak 24-hour PM10 concentration location would be on the east side of the airport near the intersection of Century Boulevard and Sepulveda Boulevard. The sources contributing to this peak concentration would include the construction of north airfield and north concourse improvements, and the bridge and roadway modifications at the entrance to the CTA.

4.2.6.2.7 Alternative 7

As shown in **Table 4.2-11**, construction concentrations for Alternative 7 would exceed the 1-hour NO_2 CAAQS and NAAQS. In addition, PM10 concentrations would exceed the 24-hour and annual CEQA thresholds set by SCAQMD, as shown in **Table 4.2-12**. Therefore, Alternative 7 construction concentrations would be significant for NO_2 and PM10. Alternative 7 construction concentrations would be less than significant for CO, SO_2, and PM2.5. The construction concentrations from Alternative 7 would be lower than Alternatives 1, 3, 5, and 6, but higher than Alternatives 2 and 4.

The primary contributors to peak NO_2 concentrations would be the construction support facilities/operations assumed to be located on the west side of the airport. The nature and characteristics of this source, as related to construction concentrations, are the same as described above for Alternative 1. These facilities/operations would contribute approximately 90 percent to the peak NO_2 concentrations that occur along the western property line.

The peak 24-hour PM10 concentration location would be on the east side of the airport near the intersection of Century Boulevard and Sepulveda Boulevard. The sources contributing to this peak concentration would include the construction of north airfield and north concourse improvements, and the bridge and roadway modifications at the entrance to the CTA.

4.2.6.2.8 Alternative 8

As shown in **Table 4.2-11**, construction concentrations for Alternative 8 would exceed the 1-hour NO_2 CAAQS and NAAQS. In addition, PM10 concentrations would exceed the 24-hour and annual CEQA thresholds set by SCAQMD, as shown in **Table 4.2-12**. Therefore, Alternative 8 construction concentrations would be significant for NO_2 and PM10. Alternative 8 construction concentrations would be less than significant for CO, SO_2, and PM2.5.

Alternative 8 focuses on ground access improvements, and can be paired with the airfield/terminal improvements associated with Alternatives 1, 2, 5, 6, or 7. The highest construction impacts from Alternative 8 would occur when it is paired with the airfield and terminal improvements under Alternative 5. The lowest construction impacts from Alternative 8 would occur when it is paired with the airfield/terminal improvements under Alternative 2. For a given airfield/terminal configuration, construction of Alternative 8 ground access improvements would generate higher concentrations than the ground access system included with Alternatives 1 and 2 and lower concentrations than the ground access system proposed for Alternative 9.

The primary contributors to peak NO_2 concentrations would be the construction support facilities/operations assumed to be located on the west side of the airport. The nature and characteristics of this source, as related to construction concentrations, are the same as described above for Alternative 1. These facilities/operations would contribute approximately 90 percent to the peak NO_2 concentrations that would occur along the western property line.

The peak 24-hour PM10 concentration location would be on the east side of the airport near the intersection of Century Boulevard and Sepulveda Boulevard. The sources contributing to this peak concentration would include the construction of north airfield and north concourse improvements, which is assumed to occur in conjunction with the ground access improvements under this alternative in order to provide a basis for comparison with the other alternatives, the bridge and roadway modifications at the entrance to the CTA, and the dedicated/elevated busway.

4.2.6.2.9 Alternative 9

As shown in **Table 4.2-11**, construction concentrations for Alternative 9 would exceed the 1-hour NO_2 CAAQS and NAAQS. In addition, PM10 concentrations would exceed the 24-hour and annual CEQA thresholds set by SCAQMD, as shown in **Table 4.2-12**. Therefore, Alternative 9 construction concentrations would be significant for NO_2 and PM10. Alternative 9 construction concentrations would be less than significant for CO, SO_2, and PM2.5.

Alternative 9 focuses on ground access improvements, and can be paired with the airfield/terminal improvements associated with Alternatives 1, 2, 5, 6, or 7. The highest construction impacts from Alternative 9 would occur when it is paired with the airfield/terminal improvements under Alternative 5. The lowest construction impacts from Alternative 9 would occur when it is paired with the airfield/terminal improvements under Alternative 2. For a given airfield/terminal configuration, construction of Alternative 9 ground access improvements would generate higher concentrations than the ground access system included with Alternatives 1 and 2, and slightly higher concentrations than the ground access system proposed for Alternative 8.

The primary contributors to peak NO_2 concentrations would be the construction support facilities/operations assumed to be located on the west side of the airport. The nature and characteristics of this source, as related to construction concentrations, are the same as described above for Alternative 1. These facilities/operations would contribute approximately 90 percent to the peak NO_2 concentrations that would occur along the western property line.

The peak 24-hour PM10 concentration location would be on the east side of the airport near the intersection of Century Boulevard and Sepulveda Boulevard. The sources contributing to this peak concentration would include the construction of north airfield and north concourse improvements, which is assumed to occur in conjunction with the ground access improvements under this alternative in order to provide a basis for comparison with the other alternatives, the bridge and roadway modifications at the entrance to the CTA, and the proposed APM guideway.

4.2.6.3 Operational Emissions

Operational emissions for Alternatives 1 through 9 are presented in **Tables 4.2-13** and **4.2-14**. **Table 4.2-13** indicates the change from baseline (2009) conditions relative to each emissions source (i.e., aircraft, APU, GSE, on- and off-airport roadways, parking facilities, and on-airport stationary sources) that would occur under each alternative. For **Table 4.2-13**, the incremental project operational emissions for each alternative were determined by calculating total airport emissions in 2025 after implementation of the alternative, then subtracting the baseline (2009) emissions. The incremental project emissions for each alternative were then compared to the significance thresholds for operations that are presented in **Table 4.2-5**. The results of that comparison for each alternative, relative to baseline (2009) conditions, are delineated in **Table 4.2-13**.

For **Table 4.2-14**, the incremental project operational emissions for each alternative were determined by calculating total airport emissions in 2025 after implementation of the alternative, then subtracting the Alternative 4 (2025) emissions. The incremental project emissions for each alternative were then compared to the significance thresholds for operations that are presented in **Table 4.2-5**. The results of that comparison for each alternative, relative to Alternative 4 conditions, are delineated in **Table 4.2-14**. Alternative 4 represents the future scenario with the least amount of airfield improvements, and thus provides a basis for comparing alternatives with the same level of aircraft activity.

In each of these emissions tables, a range of aircraft emissions is presented which represents the range of daily emissions that might occur due to different weather conditions. The high end of the emission ranges for aircraft typically represents poor weather conditions that result in greater engine-on ground delays. The grand total maximum values for each alternative are compared to the significance thresholds.

As shown in **Table 4.2-13**, many of the pollutant emissions associated with the alternatives are shown as negative values, indicating that the emissions associated with each alternative in 2025 would be lower than the existing emissions in the baseline (2009) conditions. In most cases, these negative values are due primarily to reductions in emissions from on-road motor vehicles (cars and trucks carrying passengers and cargo to and from the airport). As emission standards for motor vehicles continue to become more stringent over time, and the motor vehicle fleet is replaced with newer, less-polluting cars and trucks, the daily emissions from these sources decrease substantially when compared to baseline (2009) conditions. The reduction in motor vehicle emissions occurs even though the total VMT for airport-related trips increases between the baseline (2009) period and 2025. As reflected in **Table 4.2-13**, this emissions reduction more than compensates for the growth in emissions from aircraft and APUs for all gaseous pollutants except SO_2. Fuel sulfur content for motor vehicle fuels, as well as for aircraft fuel, does not change between the baseline (2009) condition and 2025; therefore, SO_2 emissions would increase relative to the baseline (2009) condition as noted above. In addition, fugitive road dust emission factors are assumed to remain constant between 2009 and 2025; thus, PM10 and PM2.5 emissions would increase relative to the growth in vehicle trips between 2009 and 2025.

Table 4.2-14 was developed to provide a more direct comparison between alternatives, delineating changes in emissions that are primarily attributable to the specific characteristics of each alternative, while controlling for effects of emissions standards common to all alternatives. Of the nine alternatives, Alternative 4 has the least amount of improvements and most closely represents a future (2025) "no Yellow Light Projects" scenario, from which to measure the differences in emissions that would occur with implementation of the improvements associated with each other alternative. It should be noted that Alternative 4 does not represent a future scenario with no airport improvements related to air quality impacts, as inclusion of a CONRAC (and associated consolidation/reduction of rental car company shuttle travel) in Alternative 4 provides some air quality benefits not achieved in the other alternatives, as further described below. The modeling assumptions associated with Alternative 4 do, however, account for the continued implementation of more stringent motor vehicle emissions standards and cleaner vehicle fleets in the future that would also occur with all the other alternatives. In so doing, the differences between vehicular source emissions shown in **Table 4.2-14** are more illustrative of the differences in ground access improvements between the alternatives.

Using Alternative 4 as a basis of comparison between alternatives also better represents the differences in aircraft emissions that are directly attributable to the different airfield configurations currently being considered. Under Alternative 4, the only airfield improvement would be the eastward extension of Runway 6R/24L, which would be solely to provide for additional runway safety area in accordance with FAA requirements and would not alter existing airfield operations. Within **Table 4.2-13**, the incremental aircraft emissions associated with each alternative in 2025 (i.e., buildout year) are measured against the existing aircraft emissions in the baseline (2009) condition. As such, the incremental aircraft emissions of each alternative include both the growth in aircraft activity anticipated to occur between 2009 and 2025, which is common to all alternatives, and the changes in aircraft operations that are attributable to the proposed airfield configuration specific to each alternative. The vast majority of the aircraft emissions increases shown in **Table 4.2-13** are due to the anticipated growth in aircraft activity. Within **Table 4.2-14**, the incremental aircraft emissions associated with each alternative in 2025 are measured against the 2025 emissions of Alternative 4. The same aircraft activity level and fleet mix are assumed for all alternatives in 2025. As such, the incremental aircraft emissions shown in **Table 4.2-14** are only influenced by the differences in the airfield configuration specific to each alternative.

The results of each type of comparison are discussed below. It should be noted that conclusions regarding whether the incremental emissions would result in a significant impact are based on the comparisons in **Table 4.2-13**. The comparisons in **Table 4.2-14**, which include a delineation of the SCAQMD threshold for each criteria pollutant, are provided for informational purposes only.

Table 4.2-13

Incremental Project Operational Emissions Compared to Baseline (2009) Conditions

Pollutant/ Source[1]	Alt. 1 lbs/day	Alt. 2 lbs/day	Alt. 3 lbs/day	Alt. 4 lbs/day	Alt. 5[2] lbs/day	Alt. 6[2] lbs/day	Alt. 7[2] lbs/day	Alt. 8[3] lbs/day	Alt. 9[3] lbs/day
CO									
Aircraft[4]	7,649 to 10,222	7,088 to 10,960	9,585 to 11,839	8,148 to 14,260	7,674 to 9,582	7,172 to 9,926	7,714 to 10,656	7,088 to 10,960	7,088 to 10,960
APU[4]	157 to 166	158 to 166	137 to 134	160 to 167	157 to 166	157 to 166	157 to 166	157 to 166	157 to 166
GSE[5]	1,223	1,223	1,223	1,223	1,223	1,223	1,223	1,223	1,223
On-Airport Parking	-1,953	-1,953	-1,954	-1,973	-2,031 to -1,953	-2,031 to -1,953	-2,031 to -1,953	-2,031	-2,031
On-Airport Roadways	-1,359	-1,359	-1,204	-1,357	-1,370 to -1,358	-1,370 to -1,358	-1,370 to -1,358	-1,358	-1,370
On-Airport Stationary[6]	<1	<1	2	<1	<1	<1	<1	<1	<1
Total On-Airport	5,727 to 8,290	5,165 to 9,030	7,785 to 10,043	6,208 to 12,314	5,663 to 7,652	5,161 to 7,996	5,702 to 8,726	5,088 to 8,953	5,075 to 8,940
Off-Airport Roadways	-34,569	-34,569	-35,662	-34,953	-35,133 to -34,569	-35,133 to -34,569	-35,133 to -34,569	-35,133	-35,133
Off-Airport Stationary[7]	7	7	45	1	6 to 7	7 to 8	5 to 6	6 to 8	6 to 8
Total Off-Airport	-34,562	-34,562	-35,616	-34,952	-35,127 to -34,562	-35,126 to -34,561	-35,128 to -34,563	-35,127 to -35,125	-35,127 to -35,125
Grand Total	-28,835 to -26,272	-29,397 to -25,532	-27,831 to -25,574	-28,743 to -22,638	-29,464 to -26,910	-29,965 to -26,565	-29,426 to -25,837	-30,040 to -26,173	-30,051 to -26,185
Threshold	550	550	550	550	550	550	550	550	550
Significant?	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**
VOC									
Aircraft[4]	1,358 to 1,695	1,284 to 1,787	1,643 to 1,946	1,445 to 2,227	1,361 to 1,614	1,299 to 1,658	1,364 to 1,753	1,284 to 1,787	1,284 to 1,787
APU[4]	15 to 16	15 to 16	13	15 to 16	15 to 16	15 to 16	15 to 16	15 to 16	15 to 16
GSE[5]	-187	-187	-187	-186	-187	-187	-187	-187	-187
On-Airport Parking	-319	-319	-416	-337	-375 to -319	-375 to -319	-375 to -319	-375	-375
On-Airport Roadways	-134	-134	-137	-134	-135 to -134	-135 to -134	-135 to -134	-134	-135
On-Airport Stationary[6]	<1	<1	<1	<1	<1	<1	<1	<1	<1
Total On-Airport	735 to 1,071	661 to 1,163	917 to 1,220	804 to 1,585	680 to 990	617 to 1,033	683 to 1,129	604 to 1,106	603 to 1,105
Off-Airport Roadways	-2,304	-2,304	-2,412	-2,327	-2,363 to -2,304	-2,363 to -2,304	-2,363 to -2,304	-2,363	-2,363
Off-Airport Stationary[7]	<1	<1	3	<1	<1	0 to 1	<1	0 to 1	0 to 1
Total Off-Airport	-2,304	-2,304	-2,409	-2,327	-2,363 to -2,304	-2,363 to -2,304	-2,363 to -2,304	-2,363	-2,363
Grand Total	-1,569 to -1,233	-1,643 to -1,141	-1,492 to -1,188	-1,523 to -742	-1,683 to -1,314	-1,746 to -1,270	-1,680 to -1,175	-1,759 to -1,257	-1,760 to -1,258
Threshold	55	55	55	55	55	55	55	55	55
Significant?	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**

Table 4.2-13

Incremental Project Operational Emissions Compared to Baseline (2009) Conditions

Pollutant/ Source[1]	Alt. 1 lbs/day	Alt. 2 lbs/day	Alt. 3 lbs/day	Alt. 4 lbs/day	Alt. 5[2] lbs/day	Alt. 6[2] lbs/day	Alt. 7[2] lbs/day	Alt. 8[3] lbs/day	Alt. 9[3] lbs/day
NO_x									
Aircraft[4]	9,585 to 10,034	9,484 to 10,183	9,815 to 10,366	9,704 to 10,843	9,590 to 9,916	9,506 to 9,994	9,597 to 10,116	9,484 to 10,183	9,484 to 10,183
APU[4]	275 to 280	275 to 280	263	281	275 to 280	275 to 280	275 to 280	275 to 280	275 to 280
GSE[5]	-1,149	-1,149	-1,149	-1,133	-1,149	-1,149	-1,149	-1,149	-1,149
On-Airport Parking	-1,190	-1,190	-1,480	-1,239	-1,356 to -1,190	-1,356 to -1,190	-1,356 to -1,190	-1,356	-1,356
On-Airport Roadways	-567	-567	-572	-572	-575 to -567	-575 to -567	-575 to -567	-570	-575
On-Airport Stationary[6]	<1	<1	2	<1	<1	<1	<1	<1	<1
Total On-Airport	6,960 to 7,405	6,859 to 7,554	6,880 to 7,434	7,041 to 8,161	6,789 to 7,286	6,705 to 7,364	6,796 to 7,486	6,689 to 7,384	6,683 to 7,378
Off-Airport Roadways	-14,707	-14,707	-15,123	-14,815	-14,982 to -14,707	-14,982 to -14,707	-14,982 to -14,707	-14,982	-14,982
Off-Airport Stationary[7]	1	1	8	0	1	1	1	1	1
Total Off-Airport	-14,706	-14,706	-15,115	-14,815	-14,981 to -14,706	-14,981 to -14,706	-14,982 to -14,706	-14,981	-14,981
Grand Total	-7,746 to -7,302	-7,847 to -7,153	-8,236 to -7,681	-7,773 to -6,654	-8,192 to -7,420	-8,276 to -7,342	-8,185 to -7,221	-8,292 to -7,597	-8,298 to -7,603
Threshold	55	55	55	55	55	55	55	55	55
Significant?	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**
SO_2									
Aircraft[4]	859 to 1,003	826 to 1,047	967 to 1,106	887 to 1,239	860 to 966	832 to 986	863 to 1,028	826 to 1,047	826 to 1,047
APU[4]	33 to 34	33	30 to 31	33 to 34	33 to 34	33 to 34	33 to 34	33 to 34	33 to 34
GSE[5]	0	0	0	0	0	0	0	0	0
On-Airport Parking	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
On-Airport Roadways	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
On-Airport Stationary[6]	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Total On-Airport	893 to 1,036	860 to 1,080	997 to 1,136	921 to 1,272	894 to 999	865 to 1,019	896 to 1,061	860 to 1,080	860 to 1,080
Off-Airport Roadways	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Off-Airport Stationary[7]	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Total Off-Airport	0	0	0	0	< 1	< 1	< 1	0	0
Grand Total	893 to 1,036	860 to 1,080	997 to 1,136	921 to 1,272	894 to 999	865 to 1,019	896 to 1,061	860 to 1,080	860 to 1,080
Threshold	150	150	150	150	150	150	150	150	150
Significant?	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**

Table 4.2-13

Incremental Project Operational Emissions Compared to Baseline (2009) Conditions

Pollutant/ Source[1]	Alt. 1 lbs/day	Alt. 2 lbs/day	Alt. 3 lbs/day	Alt. 4 lbs/day	Alt. 5[2] lbs/day	Alt. 6[2] lbs/day	Alt. 7[2] lbs/day	Alt. 8[3] lbs/day	Alt. 9[3] lbs/day
PM10									
Aircraft[4]	97 to 107	94 to 110	105 to 115	99 to 124	97 to 105	95 to 106	97 to 110	94 to 110	94 to 110
APU[4]	27 to 28	27 to 28	24 to 25	27 to 29	27 to 28	27 to 28	27 to 28	27 to 28	27 to 28
GSE[5]	-37	-37	-37	-37	-37	-37	-37	-37	-37
On-Airport Parking	-30	-30	52	-6	-30 to -28	-30 to -28	-30 to -28	-28	-28
On-Airport Roadways	11	11	100	7	2 to 11	2 to 11	2 to 11	8	2
On-Airport Stationary[6]	<1	<1	<1	<1	<1	<1	<1	<1	<1
Total On-Airport	69 to 78	66 to 81	244 to 255	91 to 115	60 to 77	58 to 79	60 to 82	65 to 80	60 to 74
Off-Airport Roadways	2,698	2,698	2,279	2,519	2,450 to 2,698	2,450 to 2,698	2,450 to 2,698	2,450	2,450
Off-Airport Stationary[7]	1	1	4	0	1	1	0 to 1	1	1
Total Off-Airport	2,698	2,698	2,283	2,519	2,450 to 2,698	2,450 to 2,698	2,450 to 2,698	2,450	2,450
Grand Total	2,767 to 2,776	2,765 to 2,779	2,527 to 2,538	2,610 to 2,634	2,510 to 2,776	2,508 to 2,777	2,511 to 2,781	2,515 to 2,530	2,510 to 2,525
Threshold	150	150	150	150	150	150	150	150	150
Significant?	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
PM2.5									
Aircraft[4]	97 to 107	94 to 110	105 to 115	99 to 124	97 to 105	95 to 106	97 to 110	94 to 110	94 to 110
APU[4]	27 to 28	27 to 28	24 to 25	27 to 29	27 to 28	27 to 28	27 to 28	27 to 28	27 to 28
GSE[5]	-36	-36	-36	-36	-36	-36	-36	-36	-36
On-Airport Parking	-40	-40	-27	-36	-41 to -40	-41 to -40	-41 to -40	-41	-41
On-Airport Roadways	-16	-16	-1	-17	-18 to -16	-18 to -16	-18 to -16	-17	-18
On-Airport Stationary[6]	<1	<1	<1	<1	<1	<1	<1	<1	<1
Total On-Airport	32 to 41	30 to 45	65 to 75	38 to 61	30 to 39	28 to 40	31 to 44	29 to 43	28 to 42
Off-Airport Roadways	170	170	85	135	118 to 170	118 to 170	118 to 170	118	118
Off-Airport Stationary[7]	1	1	4	0	1	1	0 to 1	1	1
Total Off-Airport	171	171	89	135	119 to 171	119 to 171	119 to 171	119	119
Grand Total	203 to 212	201 to 216	153 to 164	173 to 197	149 to 210	147 to 211	149 to 215	147 to 162	146 to 161
Threshold	55	55	55	55	55	55	55	55	55
Significant?	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**

Table 4.2-13

Incremental Project Operational Emissions Compared to Baseline (2009) Conditions

Pollutant/ Source[1]	Alt. 1 lbs/day	Alt. 2 lbs/day	Alt. 3 lbs/day	Alt. 4 lbs/day	Alt. 5[2] lbs/day	Alt. 6[2] lbs/day	Alt. 7[2] lbs/day	Alt. 8[3] lbs/day	Alt. 9[3] lbs/day

1 Project operational emissions are determined by subtracting existing airport emissions (see Table 4.2-10) from future airport emissions for each alternative. Totals may not add exactly due to rounding.

2 Alternatives 5 through 7 focus primarily on airfield improvements and related terminal and roadway improvements. Those improvements are compatible with the ground access improvements proposed under Alternatives 1, 2, 8, and 9. The emissions presented relative to airfield operations (i.e., aircraft, APU, and GSE) under Alternatives 1, 2, 5, 6, and 7 are specific to characteristics of each of these alternatives; however, the non-airfield emissions (i.e., roadways, parking, stationary, and off-airport) shown for Alternatives 5 through 7 reflect the range of those types of emissions for Alternatives 1, 2, 8, and 9. The total emissions for Alternatives 5 through 7 would fall within the range shown for each, depending on which set of ground access improvements is assumed. The emissions presented relative to both airfield and non-airfield operations for Alternatives 3 and 4 are specific to the characteristics of each of these alternatives, which still provide a basis for comparison with the other alternatives.

3 Alternatives 8 and 9 focus primarily on ground access improvements; however, those improvements are compatible with the airfield improvements, and related terminal and roadway improvements, proposed under Alternatives 1, 2, 5, 6, and 7. The emissions presented relative to non-airfield operations (i.e., roadways, parking, stationary, and off-airport) under Alternatives 1, 2, 8, and 9 are specific to characteristics of each of these alternatives; however, the airfield emissions (i.e., aircraft, APU, and GSE) shown for Alternatives 8 and 9 reflect the range of those types of emissions for Alternatives 1, 2, 5, 6, and 7. The total emissions for Alternatives 8 and 9 would fall within the range shown for each, depending on which set of airfield/terminal improvements is assumed. The emissions presented relative to both airfield and non-airfield operations for Alternatives 3 and 4 are specific to the characteristics of each of these alternatives, which still provide a basis for comparison with the other alternatives.

4 In addition to the emission ranges associated with alternative airfield and ground access development discussed in table notes 2 and 3 above, ranges in aircraft and APU emissions were developed from various weather conditions that impact airfield activity. The low end of the range typically represents good visibility with less spacing required between aircraft, and the high end of the emission range typically represents poor weather conditions with greater spacing between aircraft and more ground delay time.

5 GSE operations and activity levels are assumed to be directly related to aircraft activity levels; therefore, GSE emissions are the same for all future alternatives since aircraft activity is the same for all alternatives in 2025.

6 On-airport stationary sources are natural gas combustion units for space heating and water heating.

7 Off-airport stationary sources are natural gas combustion electric power generators supplying electricity to project facilities. It is estimated that 22 percent of LADWP power is produced in the South Coast Air Basin (Los Angeles Department of Water and Power, 2011 Power Integrated Resource Plan, December 22, 2011).

Source: CDM Smith, 2012.

Table 4.2-14

Peak Daily Project Operational Emissions Compared to Alternative 4 (2025)

Pollutant/ Source[1]	Alt. 1 lbs/day	Alt. 2 lbs/day	Alt. 3 lbs/day	Alt. 4 lbs/day	Alt. 5[2] lbs/day	Alt. 6[2] lbs/day	Alt. 7[2] lbs/day	Alt. 8[3] lbs/day	Alt. 9[3] lbs/day
CO									
Aircraft[4]	-4,039 to -499	-3,301 to -1,061	-2,422 to 1,436	--	-4,678 to -475	-4,334 to -976	-3,604 to -435	-4,678 to -435	-4,678 to -435
APU[4]	-3 to 0	-1	-33 to -23	--	-3 to 0	-3 to 0	-3 to 0	-3 to 0	-3 to 0
GSE[5]	0	0	0	--	0	0	0	0	0
On-Airport Parking	20	20	19	--	-58 to 20	-58 to 20	-58 to 20	-58	-58
On-Airport Roadways	-3	-3	152	--	-13 to -1	-13 to -1	-13 to -1	-1	-13
On-Airport Stationary[6]	<1	<1	2	--	<1	<1	<1	<1	<1
Total On-Airport	-4,024 to -482	-3,284 to -1,044	-2,271 to 1,577	--	-4,752 to -455	-4,409 to -957	-3,679 to -415	-4,741 to -494	-4,752 to -506
Off-Airport Roadways	384	384	-709	--	-181 to 384	-181 to 384	-181 to 384	-181	-181
Off-Airport Stationary[7]	6	6	44	--	6 to 7	7 to 8	5 to 6	6 to 8	6 to 8
Total Off-Airport	390	390	-664	--	-174 to 391	-173 to 392	-175 to 390	-175 to -173	-175 to -173
Grand Total	-3,634 to -92	-2,894 to -654	-2,936 to 912	--	-4,926 to -64	-4,582 to -565	-3,854 to -26	-4,915 to -666	-4,927 to -678
Threshold	550	550	550	--	550	550	550	550	550
Significant?	**No**	**No**	**Yes**	--	**No**	**No**	**No**	**No**	**No**
VOC									
Aircraft[4]	-532 to -86	-440 to -160	-281 to 198	--	-613 to -84	-569 to -146	-474 to -80	-613 to -80	-613 to -80
APU[4]	0	0	-3 to -2	--	0	0	0	0	0
GSE[5]	-1 to 0	-1 to 0	-1 to 0	--	-1 to 0	-1 to 0	-1 to 0	-1 to 0	-1 to 0
On-Airport Parking	18	18	-79	--	-38 to 18	-38 to 18	-38 to 18	-38	-38
On-Airport Roadways	0	0	-3	--	-1 to 0	-1 to 0	-1 to 0	0	-1
On-Airport Stationary[6]	<1	<1	<1	--	<1	<1	<1	<1	<1
Total On-Airport	-514 to -69	-422 to -143	-365 to 113	--	-653 to -66	-609 to -129	-514 to -63	-652 to -120	-653 to -121
Off-Airport Roadways	23	23	-85	--	-37 to 23	-37 to 23	-37 to 23	-37	-37
Off-Airport Stationary[7]	<1	<1	3	--	<1	0 to 1	<1	0 to 1	0 to 1
Total Off-Airport	23	23	-82	--	-36 to 23	-36 to 23	-36 to 23	-36	-36
Grand Total	-46	-120	31	--	-689 to -43	-643 to -105	-550 to -40	-688 to -156	-689 to -157
Threshold	55	55	55	--	55	55	55	55	55
Significant?	**No**	**No**	**No**	--	**No**	**No**	**No**	**No**	**No**

Table 4.2-14

Peak Daily Project Operational Emissions Compared to Alternative 4 (2025)

Pollutant/ Source[1]	Alt. 1 lbs/day	Alt. 2 lbs/day	Alt. 3 lbs/day	Alt. 4 lbs/day	Alt. 5[2] lbs/day	Alt. 6[2] lbs/day	Alt. 7[2] lbs/day	Alt. 8[3] lbs/day	Alt. 9[3] lbs/day
NO_x									
Aircraft[4]	-809 to -119	-660 to -220	-476 to 111	--	-927 to -114	-849 to -198	-727 to -107	-927 to -107	-927 to -107
APU[4]	-2 to -1	-1	-18 to -11	--	-2 to -1	-2 to -1	-2 to -1	-2 to -1	-2 to -1
GSE[5]	-16 to 0	-16 to 0	-16 to 0	--	-16 to 0	-16 to 0	-16 to 0	-16 to 0	-16 to 0
On-Airport Parking	49	49	-241	--	-118 to 49	-118 to 49	-118 to 49	-118	-118
On-Airport Roadways	5	5	0	--	-4 to 5	-4 to 5	-4 to 5	2	-4
On-Airport Stationary[6]	<1	<1	2	--	<1	<1	<1	<1	<1
Total On-Airport	-756 to -81	-6,007 to -182	-726 to -162	--	-1,050 to -76	-971 to -161	-850 to -70	-1,044 to -239	-1,050 to -245
Off-Airport Roadways	108	108	-308	--	-167 to 108	-167 to 108	-167 to 108	-167	-167
Off-Airport Stationary[7]	1	1	7	--	1	1	1	1	1
Total Off-Airport	109	109	-300	--	-166 to 109	-166 to 109	-167 to 109	-166	-166
Grand Total	-647 to 28	-498 to -74	-1,027 to -462	--	-1,216 to 33	-1,138 to -52	-1,017 to 39	-1,210 to -405	-1,216 to -411
Threshold	55	55	55	--	55	55	55	55	55
Significant?	**No**	**No**	**No**	--	**No**	**No**	**No**	**No**	**No**
SO_2									
Aircraft[4]	-236 to -28	-192 to -61	-133 to 79	--	-273 to -27	-253 to -56	-211 to -25	-273 to -25	-273 to -25
APU[4]	0	0	-4 to -2	--	0	0	0	0	0
GSE[5]	0	0	0	--	0	0	0	0	0
On-Airport Parking	0	0	0	--	< 1	< 1	< 1	0	0
On-Airport Roadways	0	0	0	--	< 1	< 1	< 1	0	0
On-Airport Stationary[6]	0	0	0	--	< 1	< 1	< 1	0	0
Total On-Airport	-236 to -28	-192 to -61	-135 to 76	--	-273 to -27	-253 to -56	-211 to -25	-273 to -25	-273 to -25
Off-Airport Roadways	0	0	0	--	< 1	< 1	< 1	< 1	< 1
Off-Airport Stationary[7]	0	0	0	--	< 1	< 1	< 1	< 1	< 1
Total Off-Airport	0	0	0	--	< 1	< 1	< 1	0	0
Grand Total	-236 to -28	-192 to -61	-135 to 76	--	-273 to -27	-253 to -56	-211 to -25	-273 to -25	-273 to -25
Threshold	150	150	150	--	150	150	150	150	150
Significant?	**No**	**No**	**No**	--	**No**	**No**	**No**	**No**	**No**

Table 4.2-14

Peak Daily Project Operational Emissions Compared to Alternative 4 (2025)

Pollutant/ Source[1]	Alt. 1 lbs/day	Alt. 2 lbs/day	Alt. 3 lbs/day	Alt. 4 lbs/day	Alt. 5[2] lbs/day	Alt. 6[2] lbs/day	Alt. 7[2] lbs/day	Alt. 8[3] lbs/day	Alt. 9[3] lbs/day
PM10									
Aircraft[4]	-17 to -2	-14 to -4	-9 to 6	--	-20 to -2	-18 to -4	-14 to -2	-20 to -2	-20 to -2
APU[4]	0	0	-4 to -2	--	0	0	0	0	0
GSE[5]	0	0	0	--	0	0	0	0	0
On-Airport Parking	-24	-24	59	--	-24 to -22	-24 to -22	-24 to -22	-22	-22
On-Airport Roadways	4	4	93	--	-5 to 4	-5 to 4	-5 to 4	1	-5
On-Airport Stationary[6]	<1	<1	<1	--	<1	<1	<1	<1	<1
Total On-Airport	-37 to -22	-34 to -25	140 to 153	--	-49 to -20	-47 to -22	-44 to -19	-41 to -23	-46 to -28
Off-Airport Roadways	179	179	-240	--	-69 to 179	-69 to 179	-69 to 179	-69	-69
Off-Airport Stationary[7]	1	1	4	--	1	1	0 to 1	1	1
Total Off-Airport	179	179	-236	--	-69 to 180	-69 to 180	-69 to 179	-69 to -68	-69 to -68
Grand Total	142 to 157	146 to 155	-235 to -82	--	-117 to 159	-116 to 158	-112 to 160	-109 to -91	-115 to -97
Threshold	150	150	150	--	150	150	150	150	150
Significant?	**Yes**	**Yes**	**No**	--	**Yes**	**Yes**	**Yes**	**No**	**No**
PM2.5									
Aircraft[4]	-17 to -2	-14 to -4	-9 to 6	--	-20 to -2	-18 to -4	-14 to -2	-20 to -2	-20 to -2
APU[4]	0	0	-4 to -2	--	0	0	0	0	0
GSE[5]	0	0	0	--	0	0	0	0	0
On-Airport Parking	-4	-4	9	--	-4	-4	-4	-4	-4
On-Airport Roadways	1	1	16	--	-1 to 1	-1 to 1	-1 to 1	0	-1
On-Airport Stationary[6]	<1	<1	<1	--	<1	<1	<1	<1	<1
Total On-Airport	-20 to -5	-17 to -7	14 to 27	--	-25 to -5	-24 to -7	-20 to -4	-24 to -6	-25 to -7
Off-Airport Roadways	35	35	-51	--	-17 to 35	-17 to 35	-17 to 35	-17	-17
Off-Airport Stationary[7]	1	1	4	--	1	1	0 to 1	1	1
Total Off-Airport	36	36	-47	--	-17 to 36	-16 to 36	-17 to 36	-17	-17
Grand Total	19 to 30	19 to 28	-47 to -20	--	-42 to 31	-40 to 29	-37 to 31	-40 to -22	-42 to -23
Threshold	55	55	55	--	55	55	55	55	55
Significant?	**No**	**No**	**No**	--	**No**	**No**	**No**	**No**	**No**

Table 4.2-14

Peak Daily Project Operational Emissions Compared to Alternative 4 (2025)

Pollutant/ Source[1]	Alt. 1 lbs/day	Alt. 2 lbs/day	Alt. 3 lbs/day	Alt. 4 lbs/day	Alt. 5[2] lbs/day	Alt. 6[2] lbs/day	Alt. 7[2] lbs/day	Alt. 8[3] lbs/day	Alt. 9[3] lbs/day

1 The operational emissions presented in this table represent the incremental differences of each alternative's emissions compared to those of Alternative 4. All alternatives are based on 2025 activity levels, with Alternative 4 representing the future scenario with the fewest airport improvements compared to other alternatives. Totals may not add exactly due to rounding.

2 Alternatives 5 through 7 focus primarily on airfield improvements and related terminal and roadway improvements. Those improvements are compatible with the ground access improvements proposed under Alternatives 1, 2, 8, and 9. The emissions presented relative to airfield operations (i.e., aircraft, APU, and GSE) under Alternatives 1, 2, 5, 6, and 7 are specific to characteristics of each of these alternatives; however, the non-airfield emissions (i.e., roadways, parking, stationary, and off-airport) shown for Alternatives 5 through 7 reflect the range of those types of emissions for Alternatives 1, 2, 8, and 9. The total emissions for Alternatives 5 through 7 would fall within the range shown for each, depending on which set of ground access improvements is assumed. The emissions presented relative to both airfield and non-airfield operations for Alternatives 3 and 4 are specific to the characteristics of each of these alternatives, which still provide a basis for comparison with the other alternatives.

3 Alternatives 8 and 9 focus primarily on ground access improvements; however, those improvements are compatible with the airfield improvements, and related terminal and roadway improvements, proposed under Alternatives 1, 2, 5, 6, and 7. The emissions presented relative to non-airfield operations (i.e., roadways, parking, stationary, and off-airport) under Alternatives 1, 2, 8, and 9 are specific to characteristics of each of these alternatives; however, the airfield emissions (i.e., aircraft, APU, and GSE) shown for Alternatives 8 and 9 reflect the range of those types of emissions for Alternatives 1, 2, 5, 6, and 7. The total emissions for Alternatives 8 and 9 would fall within the range shown for each, depending on which set of airfield/terminal improvements is assumed. The emissions presented relative to both airfield and non-airfield operations for Alternatives 3 and 4 are specific to the characteristics of each of these alternatives, which still provide a basis for comparison with the other alternatives.

4 In addition to the emission ranges associated with alternative airfield and ground access development discussed in table notes 2 and 3 above, ranges in aircraft and APU emissions were developed from various weather conditions that impact airfield activity. The low end of the range typically represents good visibility with less spacing required between aircraft, and the high end of the emission range typically represents poor weather conditions with greater spacing between aircraft and more ground delay time.

5 GSE operations and activity levels are assumed to be directly related to aircraft activity levels; therefore, GSE emissions are the same for all future alternatives since aircraft activity is the same for all alternatives in 2025.

6 On-airport stationary sources are natural gas combustion units for space heating and water heating.

7 Off-airport stationary sources are natural gas combustion electric power generators supplying electricity to project facilities. It is estimated that 22 percent of LADWP power is produced in the South Coast Air Basin (Los Angeles Department of Water and Power, 2011 Power Integrated Resource Plan, December 22, 2011).

Source: CDM Smith, 2012.

4.2.6.3.1 Alternative 1

Comparison to Baseline (2009) Conditions

Incremental project operations emissions, as calculated from baseline (2009) conditions, are summarized in **Table 4.2-13**. Project operational emissions of SO_2, PM10, and PM2.5 would exceed the daily operational thresholds. Therefore, Alternative 1 operational emissions of SO_2, PM10, and PM2.5 would be significant relative to baseline (2009) conditions. Aircraft and APUs are the sources of increased SO_2 emissions. Fugitive road dust is the primary source of increased PM10 and PM2.5 emissions.

Daily operational thresholds would not be exceeded for total emissions of CO, VOC, and NO_x. These pollutant emissions would not exceed their respective thresholds mainly because of ongoing implementation of more stringent motor vehicle emissions standards and cleaner future fleet mixes in the future, as described above in the introduction to the impacts analysis. These anticipated reductions in future motor vehicle emissions would more than offset the estimated increases in other types of emissions, such as from aircraft, APU, and GSE.

The majority of emissions that would increase in the future under Alternative 1 would be from aircraft. In comparison to the other alternatives, Alternative 1 peak daily aircraft emissions for all criteria pollutants (CO, VOC, NO_x, SO_2, PM10, and PM2.5) would be lower than aircraft emissions under Alternatives 2, 3, 4, and 7. Alternative 1 aircraft emissions would be the same or greater than aircraft emissions under Alternatives 5 and 6. If one were to consider airfield emissions (aircraft, APU, and GSE) alone under Alternative 1, the thresholds of significance would be exceeded for all criteria pollutants, except PM10; however, based on total emissions compared to baseline (2009) conditions, only the emissions of SO_2, PM10, and PM2.5 would be a significant impact.

Comparison to 2025 Conditions Using Alternative 4 as Basis of Comparison

Incremental project operations emissions associated with Alternative 1, as calculated in comparison to Alternative 4 (i.e., the future [2025] scenario that proposes minimal improvements), are summarized in **Table 4.2-14**. As shown in **Table 4.2-14**, the airside-related (aircraft, APU, and GSE) criteria pollutant peak daily emissions associated with Alternative 1 would range from approximately 2 to 4,040 lbs/day less than would otherwise occur under Alternative 4, depending upon the pollutant and weather condition. This comparative decrease in airside-related emissions is due primarily to reduced aircraft taxi/idle time associated with aircraft moving more efficiently on the ground with the proposed airfield improvements. Roadway- and parking-related emissions associated with Alternative 1 would be slightly greater than those of Alternative 4, with the primary distinguishing factor being that Alternative 4 has a CONRAC, which would consolidate and reduce the number of individual rental car company shuttle trips.

4.2.6.3.2 Alternative 2

Comparison to Baseline (2009) Conditions

Incremental project operations emissions, as calculated from baseline (2009) conditions, are summarized in **Table 4.2-13**. Project operational emissions of SO_2, PM10, and PM2.5 would exceed the daily operational thresholds. Therefore, Alternative 2 operational emissions of SO_2, PM10, and PM2.5 would be significant relative to baseline (2009) conditions. Aircraft and APUs are the sources of increased SO_2 emissions. Fugitive road dust is the primary source of increased PM10 and PM2.5 emissions.

Daily operational thresholds would not be exceeded for total emissions of CO, VOC, and NO_x. These pollutant emissions would not exceed their respective thresholds mainly because of ongoing implementation of more stringent motor vehicle emissions standards and cleaner future fleet mixes in the future, as described above in the introduction to the impacts analysis. These anticipated reductions in future motor vehicle emissions would more than offset the estimated increases in other types of emissions, such as from aircraft, APU, and GSE.

The majority of emissions that would increase in the future under Alternative 2 would be from aircraft. In comparison to the other alternatives, Alternative 2 peak daily aircraft emissions for all criteria pollutants

(CO, VOC, NO_x, SO_2, PM10, and PM2.5) would be lower than aircraft emissions under Alternatives 3 and 4. If one were to consider airfield emissions (aircraft, APU, and GSE) alone under Alternative 2, the thresholds of significance would be exceeded for all criteria pollutants, except PM10; however, based on total emissions compared to baseline (2009) conditions, only the emissions of SO_2, PM10, and PM2.5 would be a significant impact.

Comparison to 2025 Conditions Using Alternative 4 as Basis of Comparison

Incremental project operations emissions associated with Alternative 2, as calculated in comparison to Alternative 4 (i.e., the future [2025] scenario that proposes minimal improvements), are summarized in **Table 4.2-14**. As shown in **Table 4.2-14**, the airside-related (aircraft, APU, and GSE) criteria pollutant peak daily emissions associated with Alternative 2 would range from approximately 4 to 3,300 lbs/day less than would otherwise occur under Alternative 4, depending upon the pollutant and weather condition. Similar to Alternative 1 described above, the reduced airside-related emissions associated with Alternative 2 would be attributable to reduced aircraft taxi/idle operations as a result of the proposed airfield improvements. The differences in roadway- and parking-related emissions between Alternative 2 and Alternative 4 would be similar to those described above relative to Alternative 1, for the same reasons discussed therein.

4.2.6.3.3 Alternative 3

Comparison to Baseline (2009) Conditions

Incremental project operations emissions, as calculated from baseline (2009) conditions, are summarized in **Table 4.2-13**. Project operational emissions of SO_2, PM10, and PM2.5 would exceed the daily operational thresholds. Therefore, Alternative 3 operational emissions of SO_2, PM10, and PM2.5 would be significant relative to baseline (2009) conditions. Aircraft and APUs are the sources of increased SO_2 emissions. Fugitive road dust is the primary source of increased PM10 and PM2.5 emissions.

Daily operational thresholds would not be exceeded for total emissions of CO, VOC, and NO_x. These pollutant emissions would not exceed their respective thresholds mainly because of ongoing implementation of more stringent motor vehicle emissions standards and cleaner future fleet mixes in the future, as described above in the introduction to the impacts analysis. These anticipated reductions in future motor vehicle emissions would more than offset the estimated increases in other types of emissions, such as from aircraft, APU, and GSE.

The majority of emissions that would increase in the future under Alternative 3 would be from aircraft. In comparison to the other alternatives, Alternative 3 peak daily aircraft emissions for all criteria pollutants (CO, VOC, NO_x, SO_2, PM10, and PM2.5) would be greater than aircraft emissions under any other alternative, except Alternative 4. Average daily aircraft emissions (based on good weather conditions) for all criteria pollutants would be greater than aircraft emissions under any other alternative. If one were to consider airfield emissions (aircraft, APU, and GSE) alone under Alternative 3, the thresholds of significance would be exceeded for all criteria pollutants, except PM10; however, based on total emissions compared to baseline (2009) conditions, only the emissions of SO_2, PM10, and PM2.5 would be a significant impact.

Comparison to 2025 Conditions Using Alternative 4 as Basis of Comparison

Incremental project operations emissions associated with Alternative 3, as calculated in comparison to Alternative 4 (i.e., the future [2025] scenario that proposes minimal improvements), are summarized in **Table 4.2-14**. As shown in **Table 4.2-14**, the airside-related (aircraft, APU, and GSE) criteria pollutant peak daily emissions associated with Alternative 3 under good weather conditions would range from approximately 4 to 1,400 lbs/day more than would otherwise occur under Alternative 4, depending upon the pollutant. The primary reason for this difference in airside emissions is the comparatively greater aircraft taxi/idle time that would occur under Alternative 3 due to the "imbalance" in the number of aircraft gates on the north and south sides of the CTA (i.e., greater number of gates on the south side of the CTA, requiring more aircraft to taxi to and from the north runways when trying to balance operations between the north airfield and south airfield). However, under poor weather conditions, airside-related criteria pollutant emissions associated with Alternative 3 would range from approximately 12 to 2,450 lbs/day less than would otherwise occur under Alternative 4. One of the benefits of Alternative 3 under constrained conditions is that it has north and south center taxiways allowing aircraft to move towards the gates while other aircraft are departing or landing on the runways (crossing active runways can be done at more locations than under Alternative 4).

4.2.6.3.4 Alternative 4

Comparison to Baseline (2009) Conditions

Incremental project operations emissions, as calculated from baseline (2009) conditions, are summarized in **Table 4.2-13**. Project operational emissions of SO_2, PM10, and PM2.5 would exceed the daily operational thresholds. Therefore, Alternative 4 operational emissions of SO_2, PM10, and PM2.5 would be significant relative to baseline (2009) conditions. Aircraft and APUs are the sources of increased SO_2 emissions. Fugitive road dust is the primary source of increased PM10 and PM2.5 emissions.

Daily operational thresholds would not be exceeded for total emissions of CO, VOC, and NO_x. These pollutant emissions would not exceed their respective thresholds mainly because of ongoing implementation of more stringent motor vehicle emissions standards and cleaner future fleet mixes in the future, as described above in the introduction to the impacts analysis. These anticipated reductions in future motor vehicle emissions would more than offset the estimated increases in other types of emissions, such as from aircraft, APU, and GSE.

The majority of emissions that would increase in the future under Alternative 4 would be from aircraft. In comparison to the other alternatives, Alternative 4 peak daily aircraft emissions for all criteria pollutants (CO, VOC, NO_x, SO_2, PM10, and PM2.5) would be greater than aircraft emissions under any other alternative. If one were to consider airfield emissions (aircraft, APU, and GSE) alone under Alternative 4, the thresholds of significance would be exceeded for all criteria pollutants, except PM10; however, based on total emissions compared to baseline (2009) conditions, only the emissions of SO_2, PM10, and PM2.5 would be a significant impact.

4.2.6.3.5 Alternative 5

Comparison to Baseline (2009) Conditions

Alternative 5 focuses on changes to airfield and terminal facilities. The airfield/terminal configuration under Alternative 5 could ostensibly be paired with the ground access configurations under Alternatives 1, 2, 8, or 9. Therefore, for comparison purposes with other alternatives (i.e., fully integrated alternatives that include airfield, terminal, and ground access improvements combined), a range of total incremental emissions is presented in **Table 4.2-13** for Alternative 5. Project operational emissions of SO_2, PM10, and PM2.5 would exceed the daily operational thresholds. Therefore, Alternative 5 operational emissions of SO_2, PM10, and PM2.5 would be significant relative to baseline (2009) conditions. Aircraft and APUs are the sources of increased SO_2 emissions. Fugitive road dust is the primary source of increased PM10 and PM2.5 emissions.

Daily operational thresholds would not be exceeded for total emissions of CO, VOC, and NO_x. These pollutant emissions would not exceed their respective thresholds mainly because of ongoing implementation of more stringent motor vehicle emissions standards and cleaner future fleet mixes in the future, as described above in the introduction to the impacts analysis. These anticipated reductions in future motor vehicle emissions would more than offset the estimated increases in other types of emissions, such as from aircraft, APU, and GSE.

The majority of emissions that would increase in the future under Alternative 5 would be from aircraft. In comparison to the other alternatives, Alternative 5 peak daily aircraft emissions for all criteria pollutants (CO, VOC, NO_x, SO_2, PM10, and PM2.5) would be lower than aircraft emissions under any other alternative. If one were to consider airfield emissions (aircraft, APU, and GSE) alone under Alternative 5, the thresholds of significance would be exceeded for all criteria pollutants, except PM10; however, based on total emissions compared to baseline (2009) conditions, only the emissions of SO_2, PM10, and PM2.5 would be a significant impact.

Comparison to 2025 Conditions Using Alternative 4 as Basis of Comparison

Incremental project operations emissions associated with Alternative 5, as calculated in comparison to Alternative 4 (i.e., the future [2025] scenario that proposes minimal improvements), are summarized in **Table 4.2-14**. As shown in **Table 4.2-14**, the airside-related (aircraft, APU, and GSE) criteria pollutant peak daily emissions associated with Alternative 5 would range from approximately 2 to 4,680 lbs/day less than would otherwise occur under Alternative 4, depending upon the pollutant and weather condition. Similar to Alternative 1 described above, this comparative reduction in airside emissions would be primarily due to increased efficiency in aircraft ground movement, as afforded through the proposed airfield improvements. Emissions related to roadways and parking under Alternative 5 may be greater than or less than those of Alternative 4, depending on which ground access system improvements it is paired with (i.e., see roadway and parking emission differences associated with Alternatives 1, 2, 8, and 9).

4.2.6.3.6 Alternative 6

Comparison to Baseline (2009) Conditions

Alternative 6 focuses on changes to airfield and terminal facilities. The airfield/terminal configuration under Alternative 6 could ostensibly be paired with the ground access configurations under Alternatives 1, 2, 8, or 9. Therefore, for comparison purposes with other alternatives (i.e., fully integrated alternatives that include airfield, terminal, and ground access improvements combined), a range of total incremental emissions is presented in **Table 4.2-13** for Alternative 6. Project operational emissions of SO_2, PM10, and PM2.5 would exceed the daily operational thresholds. Therefore, Alternative 6 operational emissions of SO_2, PM10, and PM2.5 would be significant relative to baseline (2009) conditions. Aircraft and APUs are the sources of increased SO_2 emissions. Fugitive road dust is the primary source of increased PM10 and PM2.5 emissions.

Daily operational thresholds would not be exceeded for total emissions of CO, VOC, and NO_x. These pollutant emissions would not exceed their respective thresholds mainly because of ongoing implementation of more stringent motor vehicle emissions standards and cleaner future fleet mixes in the future, as described above in the introduction to the impacts analysis. These anticipated reductions in future motor vehicle emissions would more than offset the estimated increases in other types of emissions, such as from aircraft, APU, and GSE.

The majority of emissions that would increase in the future under Alternative 6 would be from aircraft. In comparison to the other alternatives, Alternative 6 peak daily aircraft emissions for all criteria pollutants (CO, VOC, NO_x, SO_2, PM10, and PM2.5) would be lower than aircraft emissions under Alternatives 1, 2, 3, 4, and 7. Alternative 6 aircraft emissions would be greater than aircraft emissions under Alternative 5. If one were to consider airfield emissions (aircraft, APU, and GSE) alone under Alternative 6, the thresholds of significance would be exceeded for all criteria pollutants, except PM10; however, based on total emissions compared to baseline (2009) conditions, only the emissions of SO_2, PM10, and PM2.5 would be a significant impact.

Comparison to 2025 Conditions Using Alternative 4 as Basis of Comparison

Incremental project operations emissions associated with Alternative 6, as calculated in comparison to Alternative 4 (i.e., the future [2025] scenario that proposes minimal improvements), are summarized in **Table 4.2-14**. As shown in **Table 4.2-14**, the airside-related (aircraft, APU, and GSE) criteria pollutant peak daily emissions associated with Alternative 6 would range from approximately 4 to 3,600 lbs/day less than would otherwise occur under Alternative 4, depending upon the pollutant and weather condition. Similar to Alternative 1 described above, this comparative reduction in airside emissions would be primarily due to increased efficiency in aircraft ground movement, as afforded through the proposed airfield improvements. Emissions related to roadways and parking under Alternative 6 may be greater than or less than those of Alternative 4, depending on which ground access system improvements it is paired with (i.e., see roadway and parking emission differences associated with Alternatives 1, 2, 8, and 9).

4.2.6.3.7 Alternative 7

Comparison to Baseline (2009) Conditions

Alternative 7 focuses on changes to airfield and terminal facilities. The airfield/terminal configuration under Alternative 7 could ostensibly be paired with the ground access configurations under Alternatives 1, 2, 8, or 9. Therefore, for comparison purposes with other alternatives (i.e., fully integrated alternatives that include airfield, terminal, and ground access improvements combined), a range of total incremental emissions is presented in **Table 4.2-13** for Alternative 7. Project operational emissions of SO_2, PM10, and PM2.5 would exceed the daily operational thresholds. Therefore, Alternative 7 operational emissions of SO_2, PM10, and PM2.5 would be significant relative to baseline (2009) conditions. Aircraft and APUs are the sources of increased SO_2 emissions. Fugitive road dust is the primary source of increased PM10 and PM2.5 emissions.

Daily operational thresholds would not be exceeded for total emissions of CO, VOC, and NO_x. These pollutant emissions would not exceed their respective thresholds mainly because of ongoing implementation of more stringent motor vehicle emissions standards and cleaner future fleet mixes in the future, as described above in the introduction to the impacts analysis. These anticipated reductions in future motor vehicle emissions would more than offset the estimated increases in other types of emissions, such as from aircraft, APU, and GSE.

The majority of emissions that would increase in the future under Alternative 7 would be from aircraft. In comparison to the other alternatives, Alternative 7 peak daily aircraft emissions for all criteria pollutants (CO, VOC, NO_x, SO_2, PM10, and PM2.5) would be lower than aircraft emissions under Alternatives 2, 3, and 4. Alternative 7 aircraft emissions would be greater than aircraft emissions under Alternatives 1, 5, and 6. If one were to consider airfield emissions (aircraft, APU, and GSE) alone under Alternative 7, the thresholds of significance would be exceeded for all criteria pollutants, except PM10; however, based on total emissions compared to baseline (2009) conditions, only the emissions of SO_2, PM10, and PM2.5 would be a significant impact.

Comparison to 2025 Conditions Using Alternative 4 as Basis of Comparison

Incremental project operations emissions associated with Alternative 7, as calculated in comparison to Alternative 4 (i.e., the future [2025] scenario that proposes minimal improvements), are summarized in **Table 4.2-14**. As shown in **Table 4.2-14**, the airside-related (aircraft, APU, and GSE) criteria pollutant peak daily emissions associated with Alternative 7 would range from approximately 2 to 4,680 lbs/day less than would otherwise occur under Alternative 4, depending upon the pollutant and weather condition. Similar to Alternative 1 described above, this comparative reduction in airside emissions would be primarily due to increased efficiency in aircraft ground movement, as afforded through the proposed airfield improvements. Emissions related to roadways and parking under Alternative 7 may be greater than or less than those of Alternative 4, depending on which ground access system improvements it is paired with (i.e., see roadway and parking emission differences associated with Alternatives 1, 2, 8, and 9).

4.2.6.3.8 Alternative 8

Comparison to Baseline (2009) Conditions

Alternative 8 focuses on ground access improvements, such as development of the ITF, use of Manchester Square for a CONRAC and parking, connecting these facilities to the CTA via an elevated/dedicated busway, and creating an additional parking lot on the Avis facility (east of Lot C). The ground access configuration under Alternative 8 could ostensibly be paired with the airfield and terminal configurations proposed under Alternatives 1, 2, 5, 6, or 7. Therefore, for comparison purposes with other alternatives (i.e., fully integrated alternatives that include airfield, terminal, and ground access improvements combined), a range of total incremental emissions is presented in **Table 4.2-13** for Alternative 8. As indicated in **Table 4.2-13**, project operational emissions of SO_2, PM10, and PM2.5 under Alternative 8 would exceed the daily operational thresholds. However, it should be noted that the increase in SO_2 is due primarily to aircraft and APU emissions, and the increase in PM10 and PM2.5 is due primarily to fugitive road dust from off-airport vehicle travel. No matter which airfield improvement scenario is assumed, the exceedance of the daily operational thresholds for SO_2, PM10, and PM2.5 would occur. Therefore, in light of this approach and assumptions, Alternative 8 operational emissions of SO_2, PM10, and PM2.5 would be significant relative to baseline (2009) conditions.

In focusing on vehicular-source emissions, which are most relevant to the main elements of this alternative, Alternative 8 on-airport peak daily traffic emissions (i.e., on-airport roadways and parking) for the criteria pollutants (CO, VOC, NO_x, SO_2, PM10, and PM2.5) would be second-lowest of all the alternatives, with only Alternative 9 having lower on-airport traffic emissions. Alternative 8 (and Alternative 9) would also have the second-lowest amount of off-airport traffic emissions, with only Alternative 3 having lower off-airport traffic emissions.

Comparison to 2025 Conditions Using Alternative 4 as Basis of Comparison

Incremental project operations emissions associated with Alternative 8, as calculated in comparison to Alternative 4 (i.e., the future [2025] scenario that proposes minimal improvements), are summarized in **Table 4.2-14**. Airside-related emissions under Alternative 8 may be greater than or less than those of Alternative 4, depending on which airfield improvements it is paired with (i.e., see aircraft emission differences associated with Alternatives 1, 2, 5, 6, and 7). Emissions associated with roadways and parking under Alternative 8 would generally be less than those of Alternative 4.

4.2.6.3.9 Alternative 9

Comparison to Baseline (2009) Conditions

Alternative 9 focuses on ground access improvements, such as development of the ITF, use of Manchester Square for a CONRAC and parking, connecting these facilities to the CTA via an APM, and creating an additional parking lot on the Avis facility (east of Lot C). The ground access configuration under Alternative 9 could ostensibly be paired with the airfield and terminal configurations proposed under Alternatives 1, 2, 5, 6, or 7. Therefore, for comparison purposes with other alternatives (i.e., fully integrated alternatives that include airfield, terminal, and ground access improvements combined), a range of total incremental emissions is presented in **Table 4.2-13** for Alternative 9. As indicated in **Table 4.2-13**, project operational emissions of SO_2, PM10, and PM2.5 under Alternative 9 would exceed the daily operational thresholds. However, it should be noted that the increase in SO_2 is due primarily to aircraft and APU emissions, and the increase in PM10 and PM2.5 is due primarily to fugitive road dust from off-airport vehicle travel. No matter which airfield improvement scenario is assumed, the exceedance of the daily operational thresholds for SO_2, PM10, and PM2.5 would occur. Therefore, in light of this approach and assumptions, Alternative 9 operational emissions of SO_2, PM10, and PM2.5 would be significant relative to baseline (2009) conditions.

In focusing on vehicular-source emissions, which are most relevant to the main elements of this alternative, Alternative 9 on-airport peak daily traffic emissions (i.e., on-airport roadways and parking) for the criteria pollutants (CO, VOC, NO_x, SO_2, PM10, and PM2.5) would be the lowest of all the alternatives. Alternative 9 (and Alternative 8) would also have the second-lowest amount of off-airport traffic emissions, with only Alternative 3 having lower off-airport traffic emissions.

Comparison to 2025 Conditions Using Alternative 4 as Basis of Comparison

Incremental project operations emissions associated with Alternative 9, as calculated in comparison to Alternative 4 (i.e., the future [2025] scenario that proposes minimal improvements), are summarized in **Table 4.2-14**. Airside-related emissions under Alternative 9 may be greater than or less than those of

Alternative 4, depending on which airfield improvements it is paired with (i.e., see aircraft emission differences associated with Alternatives 1, 2, 5, 6, and 7). Emissions associated with roadways and parking under Alternative 9 would generally be less than those of Alternative 4.

4.2.6.4 Operational Concentrations

Ambient concentrations resulting from operations, including background concentrations, for CO, NO_2, and SO_2 under Alternatives 1 through 9 are presented in **Table 4.2-15** and compared to the appropriate NAAQS and CAAQS. Since the project is located in a nonattainment area for PM10 and PM2.5, the project concentrations are compared against the SCAQMD significance thresholds for short term and annual PM10 and PM2.5, instead of the NAAQS or CAAQS. The PM10 and PM2.5 project concentrations are shown in **Table 4.2-16**.

4.2.6.4.1 Alternative 1

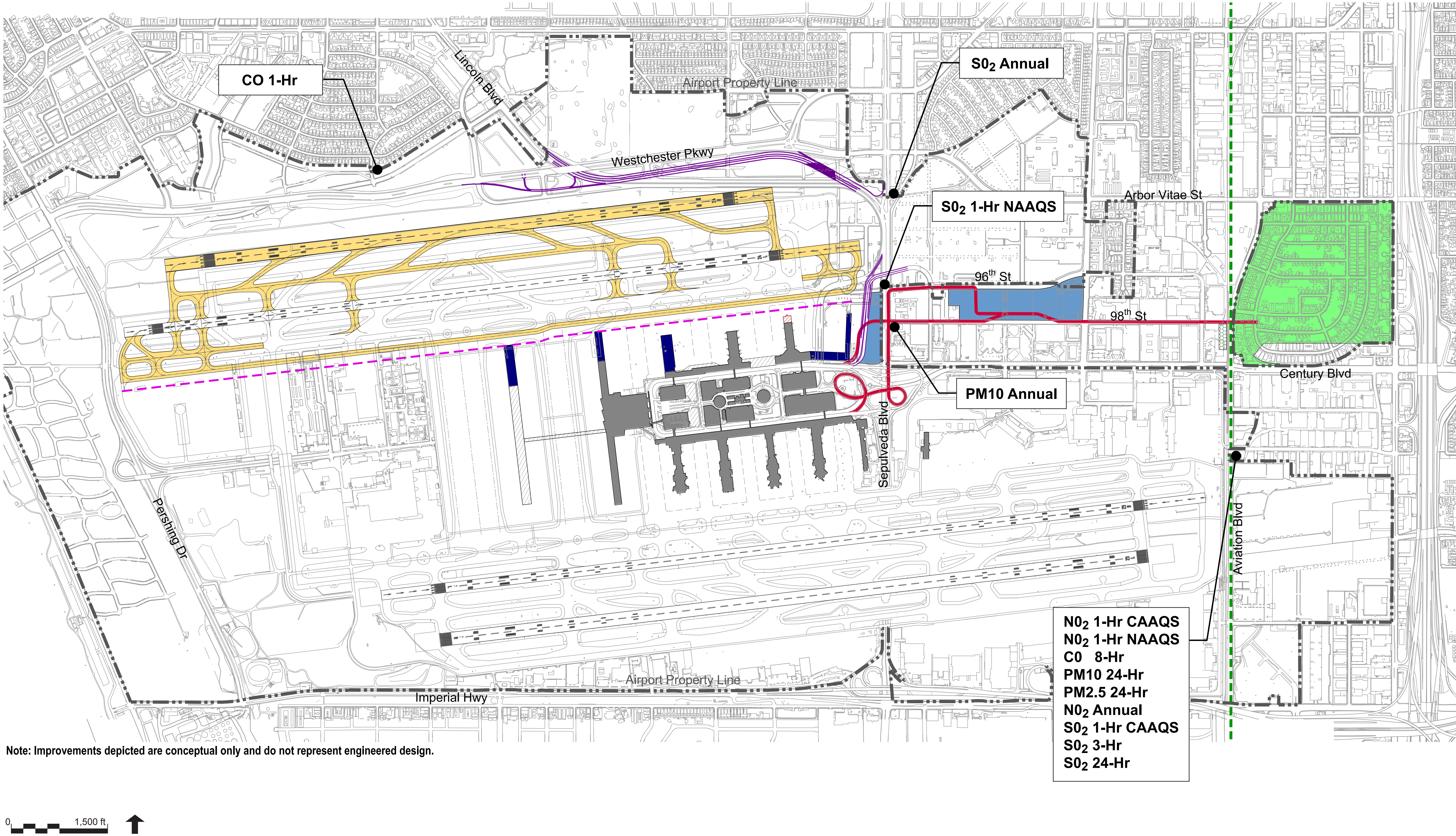
Operational impacts of Alternative 1 in 2025 were analyzed using the methods described in Section 4.2.2.2. The estimated operational concentrations shown in **Table 4.2-15** indicate that, with the exception of the 1-hour NO_2 CAAQS and NAAQS, all other NAAQS or CAAQS for CO, NO_2, and SO_2 would not be exceeded. As shown in **Table 4.2-16**, the project incremental concentrations of PM10 and PM2.5 concentrations would exceed the SCAQMD significance thresholds.

Implementation of Alternative 1 would exceed the 1-hour NAAQS for NO_2, the 1-hour CAAQS for NO_2, and the SCAQMD significance thresholds for PM10 and PM2.5; therefore, Alternative 1 operational concentrations would be significant for NO_2, PM10, and PM2.5. Aircraft in the takeoff mode would contribute over 95 percent to the peak 1-hour NO_2 concentrations, and the peak 1-hour NO_2 impact locations would be on the LAX property line east of Runway 25R. Aircraft would also be a substantial (approximately 50 percent) source of PM10 and PM2.5, and the peak daily concentrations of PM10 and PM2.5 would occur along the eastern property line downwind of the departure runway (Runway 25R), in the same location as the peak 1-hour CAAQS concentration for NO_2. Peak impact locations for each pollutant and averaging period for Alternative 1 are shown in **Figure 4.2-2**. The exceedance of the 1-hour NO_2 CAAQS and NAAQS would occur under all of the alternatives. The exceedance of the PM10 and PM2.5 thresholds would also occur under all alternatives. The extent to which these standards would be exceeded under Alternative 1 would be less than the exceedance that would otherwise occur under Alternative 4 (i.e., future NO_2 NAAQS, PM10, and PM2.5 concentrations would be higher if Alternative 1 improvements were not made to the airfield).

4.2.6.4.2 Alternative 2

Operational impacts of Alternative 2 in 2025 were analyzed using the methods described in Section 4.2.2.2. The estimated operational concentrations shown in **Table 4.2-15** indicate that, with the exception of the 1-hour NO_2 CAAQS and NAAQS, all other NAAQS or CAAQS for CO, NO_2, and SO_2 would not be exceeded. As shown in **Table 4.2-16**, the project incremental concentrations of PM10 and PM2.5 concentrations would exceed the SCAQMD significance thresholds.

Implementation of Alternative 2 would exceed the 1-hour NAAQS for NO_2, the 1-hour CAAQS for NO_2, and the SCAQMD significance thresholds for PM10 and PM2.5; therefore, Alternative 2 operational concentrations would be significant for NO_2, PM10, and PM2.5. Aircraft in the takeoff mode would contribute over 95 percent to the peak 1-hour NO_2 concentrations, and the peak 1-hour NO_2 NAAQS impact location would be on the LAX property line east of Runway 25R, and the peak 1-hour NO_2 CAAQS impact location would be on the LAX property line north of the north airfield along Sepulveda Boulevard. Aircraft would also be a substantial (approximately 50 percent) source of PM10 and PM2.5, and the peak daily concentrations of PM10 and PM2.5 would occur along the eastern property line downwind of the departure runway (Runway 25R), in the same location as the peak 1-hour NAAQS concentration for NO_2.



Note: Improvements depicted are conceptual only and do not represent engineered design.

Source: CDM Smith, 2012.

Peak Operational Concentrations Locations
Alternative 1

Figure
4.2-2

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Table 4.2-15

Peak Operational Concentrations including Background

Pollutant/ Source[1]	Averaging Period	Alt. 1 (µg/m³)	Alt. 2 (µg/m³)	Alt. 3 (µg/m³)	Alt. 4 (µg/m³)	Alt. 5[2,14] (µg/m³)	Alt. 6[2,14] (µg/m³)	Alt. 7[2,14] (µg/m³)	Alt. 8[3] (µg/m³)	Alt. 9[3] (µg/m³)
CO	CAAQS									
Alternative	1-Hour	1,225 to 1,856	1,068 to 1,325	1,995 to 2,000	2,120 to 3,182	1,301 to 1,888	1,109 to 1,657	1,155 to 1,816	1,068 to 1,888	1,068 to 1,888
Background	1-Hour	4,581	4,581	4,581	4,581	4,581	4,581	4,581	4,581	4,581
Total	1-Hour	5,806 to 6,437	5,649 to 5,906	6,576 to 6,581	6,701 to 7,763	5,882 to 6,469	5,689 to 6,237	5,736 to 6,397	5,649 to 6,469	5,649 to 6,469
Threshold[4]	1-Hour	23,000	23,000	23,000	23,000	23,000	23,000	23,000	23,000	23,000
Significant?	1-Hour	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**
	CAAQS/NAAQS									
Alternative	8-Hour	303 to 490	275 to 419	555 to 631	384 to 914	303 to 459	294 to 482	299 to 510	275 to 510	275 to 510
Background[5]	8-Hour	2,897	2,897	2,897	2,897	2,897	2,897	2,897	2,897	2,897
Total	8-Hour	3,201 to 3,387	3,172 to 3,317	3,452 to 3,528	3,282 to 3,812	3,201 to 3,357	3,191 to 3,379	3,197 to 3,407	3,172 to 3,407	3,172 to 3,407
Threshold[6]	8-Hour	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000
Significant?	8-Hour	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**
NO_2	CAAQS									
Alternative	1-Hour	356 to 686	214 to 250	313 to 432	351 to 464	355 to 686	354 to 686	355 to 687	250 to 687	250 to 687
Background	1-Hour	177	177	177	177	177	177	177	177	177
Total	1-Hour	533 to 863	391 to 427	489 to 609	528 to 641	532 to 862	531 to 863	532 to 864	427 to 864	427 to 864
Threshold[7]	1-Hour	339	339	339	339	339	339	339	339	339
Significant?	1-Hour	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
	NAAQS									
Alternative	1-Hour	155 to 189	148 to 186	197 to 218	204 to 214	154 to 188	153 to 189	154 to 189	148 to 189	148 to 189
Background	1-Hour	76	76	76	76	76	76	76	76	76
Total	1-Hour	231 to 265	224 to 262	272 to 294	280 to 290	230 to 264	229 to 265	230 to 265	224 to 265	224 to 265
Threshold[8]	1-Hour	188	188	188	188	188	188	188	188	188
Significant?	1-Hour	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
	CAAQS/NAAQS									
Alternative	Annual	17	17	12	14	17	17	12	12 to 17	12 to 17
Background	Annual	26	26	26	26	26	26	26	26	26
Total	Annual	43	43	38	40	43	43	39	39 to 43	39 to 43
Threshold[9]	Annual	57	57	57	57	57	57	57	57	57
Significant?	Annual	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**
SO_2	CAAQS									
Alternative	1-Hour	158 to 273	105 to 140	158 to 206	135 to 243	157 to 273	154 to 273	155 to 276	105 to 276	105 to 276
Background	1-Hour	65	65	65	65	65	65	65	65	65
Total	1-Hour	224 to 339	170 to 206	223 to 272	200 to 308	222 to 338	219 to 339	221 to 341	170 to 341	170 to 341
Threshold[10]	1-Hour	655	655	655	655	655	655	655	655	655

Table 4.2-15

Peak Operational Concentrations including Background

Pollutant/ Source[1]	Averaging Period	Alt. 1 (µg/m³)	Alt. 2 (µg/m³)	Alt. 3 (µg/m³)	Alt. 4 (µg/m³)	Alt. 5[2,14] (µg/m³)	Alt. 6[2,14] (µg/m³)	Alt. 7[2,14] (µg/m³)	Alt. 8[3] (µg/m³)	Alt. 9[3] (µg/m³)
Significant?	1-Hour NAAQS	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**
Alternative	1-Hour	82 to 104	98 to 105	145 to 152	94 to 150	82 to 99	81 to 103	101 to 131	81 to 131	81 to 131
Background	1-Hour	37	37	37	37	37	37	37	37	37
Total	1-Hour	119 to 140	134 to 142	181 to 188	130 to 187	119 to 136	118 to 140	137 to 168	118 to 168	118 to 168
Threshold[11]	1-Hour	196	196	196	196	196	196	196	196	196
Significant?	1-Hour NAAQS	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**
Alternative	3-Hour	81 to 92	58 to 72	84 to 97	87 to 101	80 to 92	78 to 92	79 to 93	58 to 93	58 to 93
Background	3-Hour	10	10	10	10	10	10	10	10	10
Total	3-Hour	91 to 103	68 to 82	94 to 107	97 to 112	90 to 102	89 to 103	90 to 104	68 to 104	68 to 104
Threshold[12]	3-Hour	1,300	1300	1300	1300	1300	1300	1300	1300	1300
Significant?	3-Hour CAAQS/NAAQS	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**
Alternative	24-Hour	14 to 19	14 to 18	19 to 25	18 to 23	14 to 19	14 to 19	14 to 19	14 to 19	14 to 19
Background	24-Hour	16	16	16	16	16	16	16	16	16
Total	24-Hour	30 to 35	30 to 34	35 to 41	33 to 38	30 to 34	30 to 35	29 to 35	29 to 35	29 to 35
Threshold[13]	24-Hour	105	105	105	105	105	105	105	105	105
Significant?	24-Hour NAAQS	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**
Alternative	Annual	6	6	7	6	6	6	5	5 to 6	5 to 6
Background	Annual	3	3	3	3	3	3	3	3	3
Total	Annual	9	9	9	9	9	9	8	8 to 9	8 to 9
Threshold[13]	Annual	80	80	80	80	80	80	80	80	80
Significant?	Annual	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**	**No**

Table 4.2-15

Peak Operational Concentrations including Background

Pollutant/ Source[1]	Averaging Period	Alt. 1 ($\mu g/m^3$)	Alt. 2 ($\mu g/m^3$)	Alt. 3 ($\mu g/m^3$)	Alt. 4 ($\mu g/m^3$)	Alt. 5[2,14] ($\mu g/m^3$)	Alt. 6[2,14] ($\mu g/m^3$)	Alt. 7[2,14] ($\mu g/m^3$)	Alt. 8[3] ($\mu g/m^3$)	Alt. 9[3] ($\mu g/m^3$)

1 The significance thresholds for CO, NO_2, and SO_2 are based on California and/or National Ambient Air Quality Standards (CAAQS and/or NAAQS) which are absolute thresholds. Therefore, future operational concentrations are determined by adding existing background concentrations to the calculated future airport-related concentrations under a given alternative for comparison to the thresholds. Totals may not add exactly due to rounding.

2 On-airport roadway and parking-related concentrations for Alternatives 5, 6, and 7 are assumed to be equal to the roadway and parking-related concentrations for Alternatives 1 and 2 for comparative purposes only. Alternatives 5, 6, and 7 are airfield/terminal improvement options only and do not impact on-airport roadway and parking configurations. See Appendix C for summaries of source contributions to peak receptors.

3 Aircraft and APU-concentrations for Alternatives 8 and 9 are assumed to be within the range of aircraft and APU-related concentrations for Alternatives 1, 2, 5, 6, and 7. Alternatives 8 and 9 are ground access (i.e., on-airport roadway and parking options) only and do not impact airfield or terminal configurations. See Appendix C for summaries of source contributions to peak receptors.

4 The 1-Hour CO threshold is the 1-Hour CO CAAQS since this standard is more stringent than the 1-Hour CO NAAQS.

5 Although the CAAQS and NAAQS background design value are different, because the standards are the same and CAAQS background is higher, this represents a more conservative value.

6 The 8-Hour CO threshold is equivalent to both the 8-Hour CO CAAQS and 8-Hour CO NAAQS. Although the CAAQS and NAAQS background design value are different, because the standards are the same and CAAQS background is higher, this represents a more conservative value.

7 The 1-Hour NO_2 CAAQS is not to be exceeded.

8 The 1-Hour NO_2 NAAQS is based on the 3-year average of the 98th percentile of daily maximum 1-hour concentrations.

9 The annual NO_2 threshold is the annual NO_2 CAAQS since this standard is more stringent than the annual NO_2 NAAQS.

10 The 1-Hour SO_2 CAAQS is not to be exceeded.

11 The 1-Hour SO_2 NAAQS is based on the 3-year average of the 99th percentile of daily maximum 1-hour concentrations.

12 The 3-Hour SO_2 NAAQS is not to be exceeded more than once per year.

13 The 24-Hour SO_2 NAAQS and CAAQS, and annual SO_2 NAAQS, are not to be exceeded.

14 Concentrations from Alternatives 5 through 7 may vary slightly from the values shown depending on the ground access option that is selected. However, the aircraft are the major contributor to the peak concentrations, therefore this variation would be minor.

Source: CDM Smith, 2012.

Table 4.2-16

Peak Incremental Operational Concentrations for PM10 and PM2.5

Pollutant/ Source[1]	Averaging Period	Alt. 1 (μg/m³)	Alt. 2 (μg/m³)	Alt. 3 (μg/m³)	Alt. 4 (μg/m³)	Alt. 5[2] (μg/m³)	Alt. 6[2] (μg/m³)	Alt. 7[2] (μg/m³)	Alt. 8[3] (μg/m³)	Alt. 9[3] (μg/m³)
PM10										
Alternative	24-Hour	2.6 to 3.1	2.7 to 2.9	70.2 to 70.5	4.4	2.6 to 3.1	2.6 to 3.1	3.4	2.6 to 3.4	2.6 to 3.4
Threshold	24-Hour	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Significant?	24-Hour	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
Alternative	Annual	1.2	1.2	37.0	2.1	1.2	1.2	1.4	1.2 to 1.4	1.2 to 1.4
Threshold	Annual	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Significant?	Annual	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**
PM2.5										
Alternative	24-Hour	1.2 to 2.5	1.3 to 2.3	12.5 to 13.3	2.0 to 2.8	1.1 to 2.5	1.1 to 2.5	1.1 to 2.5	1.1 to 2.5	1.1 to 2.5
Threshold	24-Hour	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Significant?	24-Hour	**Yes**	**Yes**[4]	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**

1 The significance thresholds for PM10 and PM2.5 are based on project incremental thresholds developed by SCAQMD. Therefore, future construction concentrations are the values under a given alternative to be compared to the thresholds.

2 On-airport roadway and parking-related concentrations for Alternatives 5, 6, and 7 are assumed to be equal to the roadway and parking-related concentrations for Alternatives 1 and 2 for comparative purposes only. Alternatives 5, 6, and 7 are airfield/terminal improvement options only and do not impact on-airport roadway and parking configurations. See Appendix C for summaries of source contributions to peak receptors.

3 Aircraft and APU-concentrations for Alternatives 8 and 9 are assumed to be within the range of aircraft and APU-related concentrations for Alternatives 1, 2, 5, 6, and 7. Alternatives 8 and 9 are ground access (i.e., on-airport roadway and parking) options only and do not impact airfield or terminal configurations. See Appendix C for summaries of source contributions to peak receptors.

4 The project increment for Alternative 2 is just under the significance threshold. Given that the peak daily concentrations for all other alternatives are higher than the threshold, and that there is a very small margin between the peak daily concentration for Alternative 2 and the threshold, the lead agency is identifying the PM2.5 project concentration as significant.

Source: CDM Smith, 2012.

Peak impact locations for each pollutant and averaging period for Alternative 2 are shown in **Figure 4.2-3**. The exceedance of the 1-hour NO_2 CAAQS and NAAQS would occur under all of the alternatives. The exceedance of the PM10 and PM2.5 thresholds would also occur under all alternatives. The extent to which these standards would be exceeded under Alternative 2 would be slightly less than the exceedance that would otherwise occur under Alternative 4 (i.e., future NO_2, PM10, and PM2.5 concentrations would be higher if Alternative 2 improvements were not made to the airfield).

4.2.6.4.3 Alternative 3

Operational impacts of Alternative 3 in 2025 were analyzed using the methods described in Section 4.2.2.2. The estimated operational concentrations shown in **Table 4.2-15** indicate that, with the exception of the 1-hour NO_2 CAAQS and NAAQS, all other NAAQS or CAAQS for CO, NO_2, and SO_2 would not be exceeded. As shown in **Table 4.2-16**, the project incremental concentrations of PM10 and PM2.5 concentrations would exceed the SCAQMD significance thresholds.

Implementation of Alternative 3 would exceed the 1-hour NAAQS for NO_2, the 1-hour CAAQS for NO_2, and the SCAQMD significance thresholds for PM10 and PM2.5; therefore, Alternative 3 operational concentrations would be significant for NO_2, PM10, and PM2.5. Aircraft in the takeoff mode would contribute over 95 percent to the peak 1-hour NO_2 concentrations, and the peak 1-hour NO_2 CAAQS impact locations would be on the LAX property line east of Runway 25R, and the peak 1-hour NO_2 NAAQS impact location would be on the LAX property line east of the CTA along Sepulveda Boulevard. The peak daily concentrations of PM10 and PM2.5 would occur along the eastern property line near the roadway connecting the GTC, ITC and surface parking lot. Peak impact locations for each pollutant and averaging period for Alternative 3 are shown in **Figure 4.2-4**. The exceedance of the 1-hour NO_2 CAAQS and NAAQS and would occur under all of the alternatives, and the exceedance of the PM10 and PM2.5 thresholds would also occur under all alternatives. The extent to which these standards would be exceeded would be greater than the exceedance that would otherwise occur under Alternative 4. The main contributing factors to why the concentrations associated with Alternative 3 would be greater than those of Alternative 4 are the comparatively greater taxi/idle emissions from aircraft (i.e., comparatively longer taxiing distances), and an extensive on-airport roadway system along the eastern airport boundary contributing fugitive road dust to the eastern fenceline receptors.

4.2.6.4.4 Alternative 4

Operational impacts of Alternative 4 in 2025 were analyzed using the methods described in Section 4.2.2.2. The estimated operational concentrations shown in **Table 4.2-15** indicate that, with the exception of the 1-hour NO_2 CAAQS and NAAQS, all other NAAQS or CAAQS for CO, NO_2, and SO_2 would not be exceeded. As shown in **Table 4.2-16**, the project incremental concentrations of PM10 and PM2.5 concentrations would exceed the SCAQMD significance thresholds. This would be a significant impact.

Implementation of Alternative 4 would exceed the 1-hour NAAQS for NO_2, the 1-hour CAAQS for NO_2, and the SCAQMD significance thresholds for PM10 and PM2.5; therefore, Alternative 4 operational concentrations would be significant for NO_2, PM10, and PM2.5. Aircraft in the takeoff mode would contribute over 95 percent to the peak 1-hour NO_2 concentrations, and the peak 1-hour NO_2 impact locations would be on the LAX property line east of Runway 25R. The peak PM10 and PM2.5 concentrations would also be located on the LAX property line east of South Airfield, near the ITC. Peak impact locations for each pollutant and averaging period are shown in **Figure 4.2-5** for Alternative 4. The exceedance of the 1-hour NO_2 CAAQS and NAAQS would occur under all of the alternatives and the exceedance of the PM10 and PM2.5 thresholds would also occur under all alternatives. The exceedance occurring under Alternative 4 would be the second highest of all the alternatives, with only Alternative 3 having a greater level of exceedance.

4.2.6.4.5 Alternative 5

Operational impacts of Alternative 5 in 2025 were analyzed using the methods described in Section 4.2.2.2. Alternative 5 focuses on airfield and related terminal improvements. The airfield/terminal configuration under Alternative 5 could ostensibly be paired with ground access configurations under Alternatives 1, 2, 8, or 9. Therefore, for comparison purposes with other alternatives (i.e., fully integrated alternatives that include airfield, terminal, and ground access improvements combined), a range of project concentrations for Alternative 5 is presented in **Tables 4.2-15** and **4.2-16**.

The estimated operational concentrations shown in **Table 4.2-15** for Alternative 5 indicate that the 1-hour NO_2 CAAQS and NAAQS would be exceeded; all other NAAQS or CAAQS for CO, NO_2, and SO_2 would not be exceeded. In addition, the project incremental concentrations shown in **Table 4.2-16** indicate that PM10 and PM2.5 concentrations under Alternative 5 would exceed the SCAQMD significance thresholds.

Implementation of Alternative 5 would exceed the 1-hour NAAQS for NO_2, the 1-hour CAAQS for NO_2, and the SCAQMD significance thresholds for PM10 and PM2.5; therefore, Alternative 5 operational concentrations would be significant for NO_2, PM10, and PM2.5. Aircraft in the takeoff mode would contribute over 95 percent to the peak 1-hour NO_2 concentrations, and the peak 1-hour NO_2 impact locations would be on the LAX property line east of Runway 25R. Aircraft would also be a substantial (approximately 50 percent) source of PM10 and PM2.5, and the peak daily concentrations of PM10 and PM2.5 would occur along the eastern property line downwind of the departure runway (Runway 25R), in the same location as the peak 1-hour concentrations for NO_2. Estimated peak impact locations for each pollutant and averaging period for Alternative 5 are shown in **Figure 4.2-6**.

4.2.6.4.6 Alternative 6

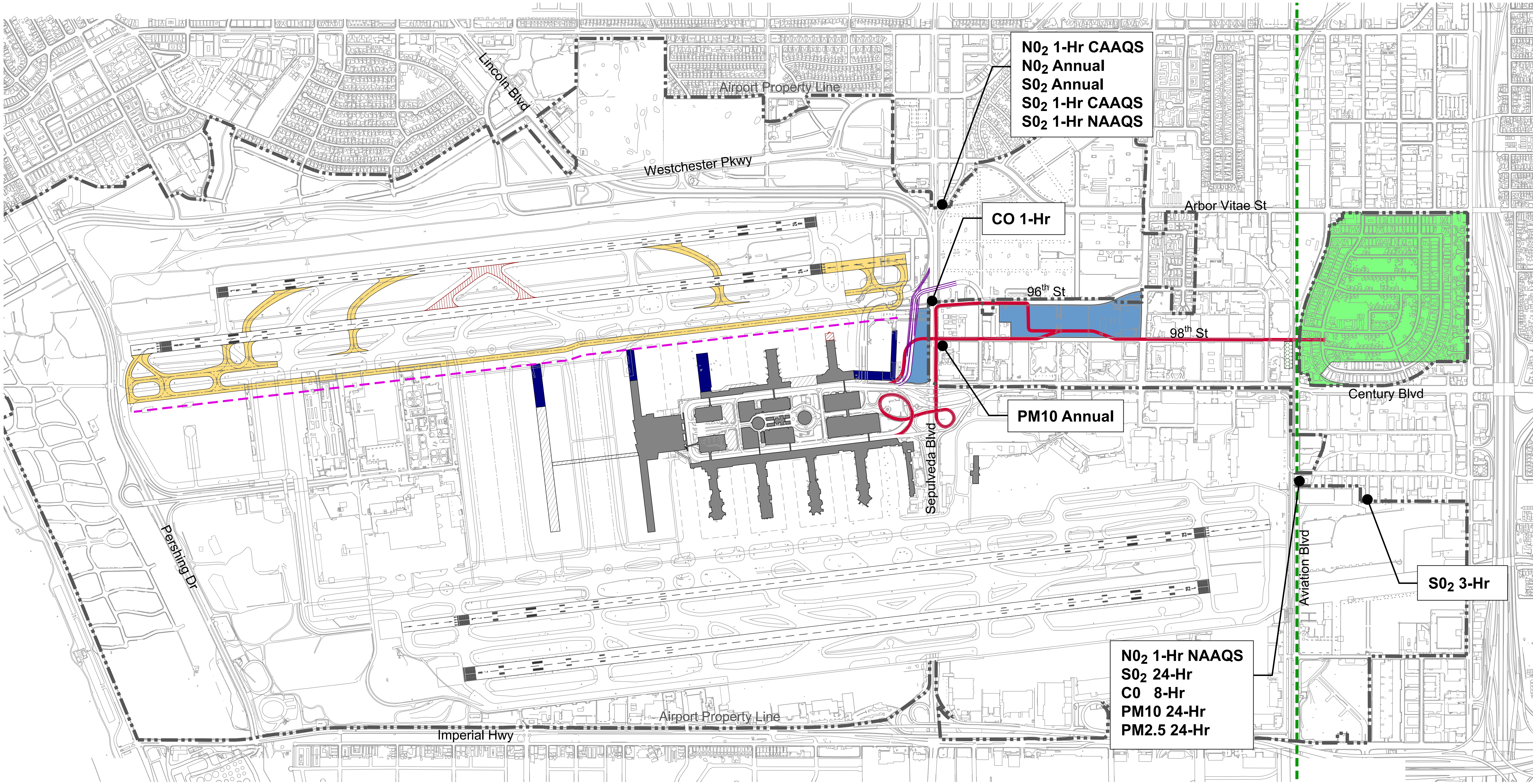
Operational impacts of Alternative 6 in 2025 were analyzed using the methods described in Section 4.2.2.2. Alternative 6 focuses on airfield and related terminal improvements. The airfield/terminal configuration under Alternative 6 could ostensibly be paired with ground access configurations under Alternatives 1, 2, 8, or 9. Therefore, for comparison purposes with other alternatives (i.e., fully integrated alternatives that include airfield, terminal, and ground access improvements combined), a range of project concentrations for Alternative 6 is presented in **Tables 4.2-15** and **4.2-16**.

The estimated operational concentrations shown in **Table 4.2-15** for Alternative 6 indicate that the 1-hour NO_2 CAAQS and NAAQS would be exceeded; all other NAAQS or CAAQS for CO, NO_2, and SO_2 would not be exceeded. In addition, the project incremental concentrations shown in **Table 4.2-16** indicate that PM10 and PM2.5 concentrations under Alternative 6 would exceed the SCAQMD significance thresholds.

Implementation of Alternative 6 would exceed the 1-hour NAAQS for NO_2, the 1-hour CAAQS for NO_2, and the SCAQMD significance thresholds for PM10 and PM2.5; therefore, Alternative 6 operational concentrations would be significant for NO_2, PM10, and PM2.5. Aircraft in the takeoff mode would contribute over 95 percent to the peak 1-hour NO_2 concentrations, and the peak 1-hour NO_2 impact locations would be on the LAX property line east of Runway 25R. Aircraft would also be a substantial (approximately 50 percent) source of PM10 and PM2.5, and the peak daily concentrations of PM10 and PM2.5 would occur along the eastern property line downwind of the departure runway (Runway 25R), in the same location as the peak 1-hour concentrations for NO_2. Estimated peak impact locations for each pollutant and averaging period for Alternative 6 are shown in **Figure 4.2-7**.

4.2.6.4.7 Alternative 7

Operational impacts of Alternative 7 in 2025 were analyzed using the methods described in Section 4.2.2.2. Alternative 7 focuses on airfield and related terminal improvements. The airfield/terminal configuration under Alternative 7 could ostensibly be paired with ground access configurations under Alternatives 1, 2, 8, or 9. Therefore, for comparison purposes with other alternatives (i.e., fully integrated alternatives that include airfield, terminal, and ground access improvements combined), a range of project concentrations for Alternative 7 is presented in **Tables 4.2-15** and **4.2-16**.



Note: Improvements depicted are conceptual only and do not represent engineered design.

0 1,500 ft
Scale
north

Source: CDM Smith, 2012.

LAX Specific Plan Amendment Study Draft EIR	Peak Operational Concentrations Locations Alternative 2	Figure 4.2-3

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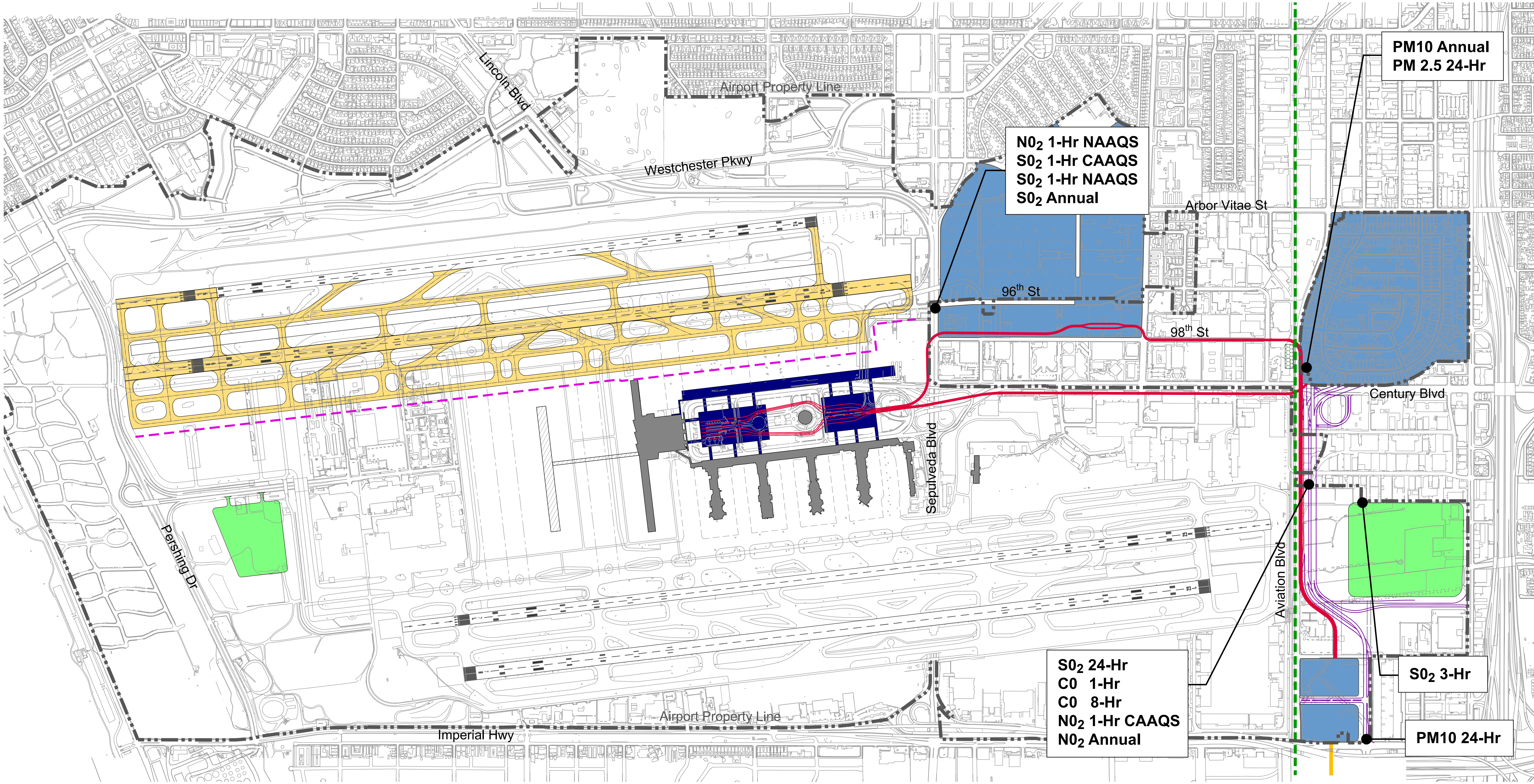

Note: Improvements depicted are conceptual only and do not represent engineered design.

0 1,500 ft
Scale
north

Source: CDM Smith, 2012.

LAX Specific Plan Amendment Study Draft EIR

Peak Operational Concentrations Locations
Alternative 3

Figure
4.2-4

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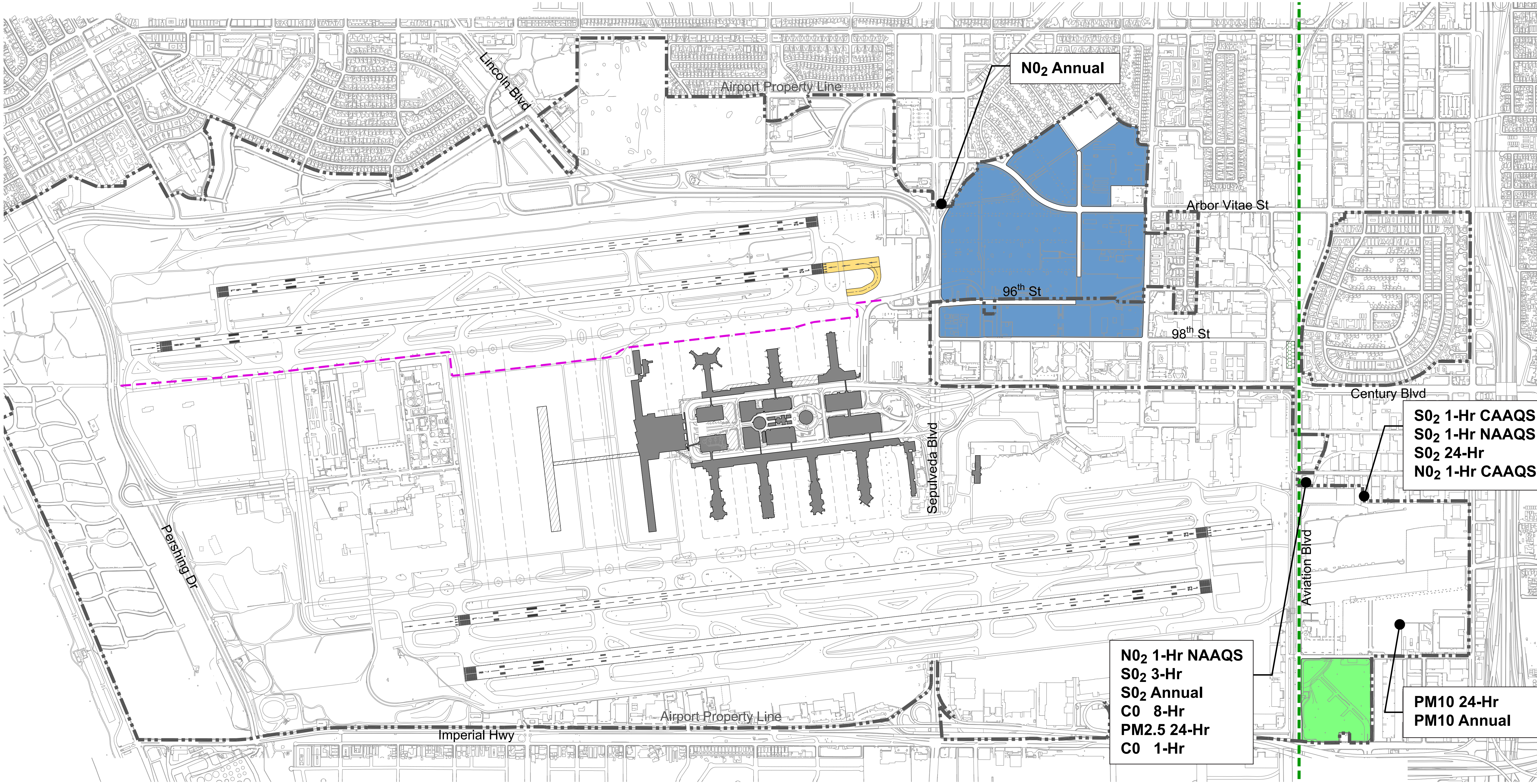

Note: Improvements depicted are conceptual only and do not represent engineered design.

Source: CDM Smith, 2012.

LAX Specific Plan Amendment Study Draft EIR	Peak Operational Concentrations Locations Alternative 4	Figure 4.2-5

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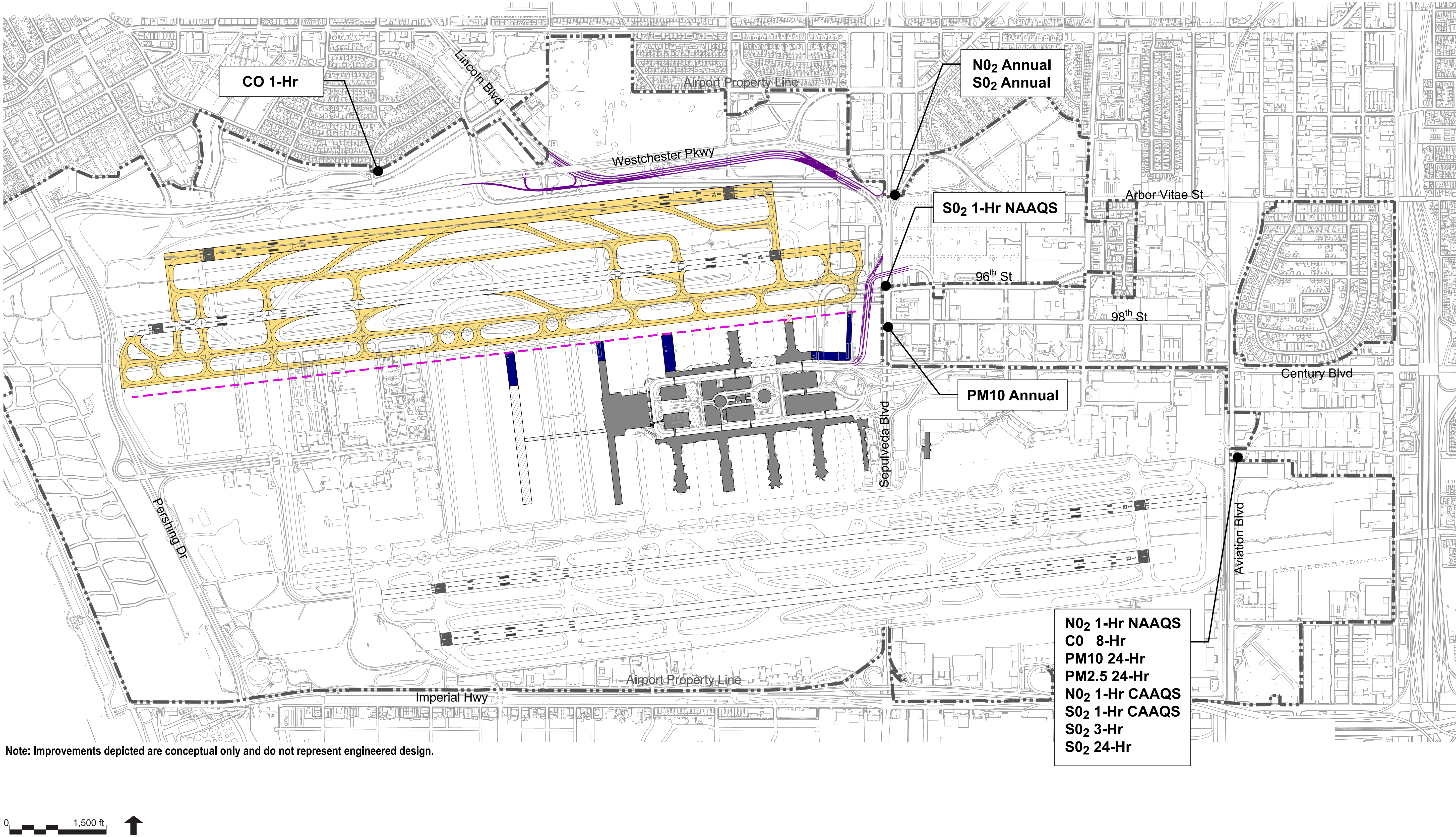

Note: Improvements depicted are conceptual only and do not represent engineered design.

Source: CDM Smith, 2012.

LAX Specific Plan Amendment Study Draft EIR

Peak Operational Concentrations Locations
Alternative 5

Figure
4.2-6

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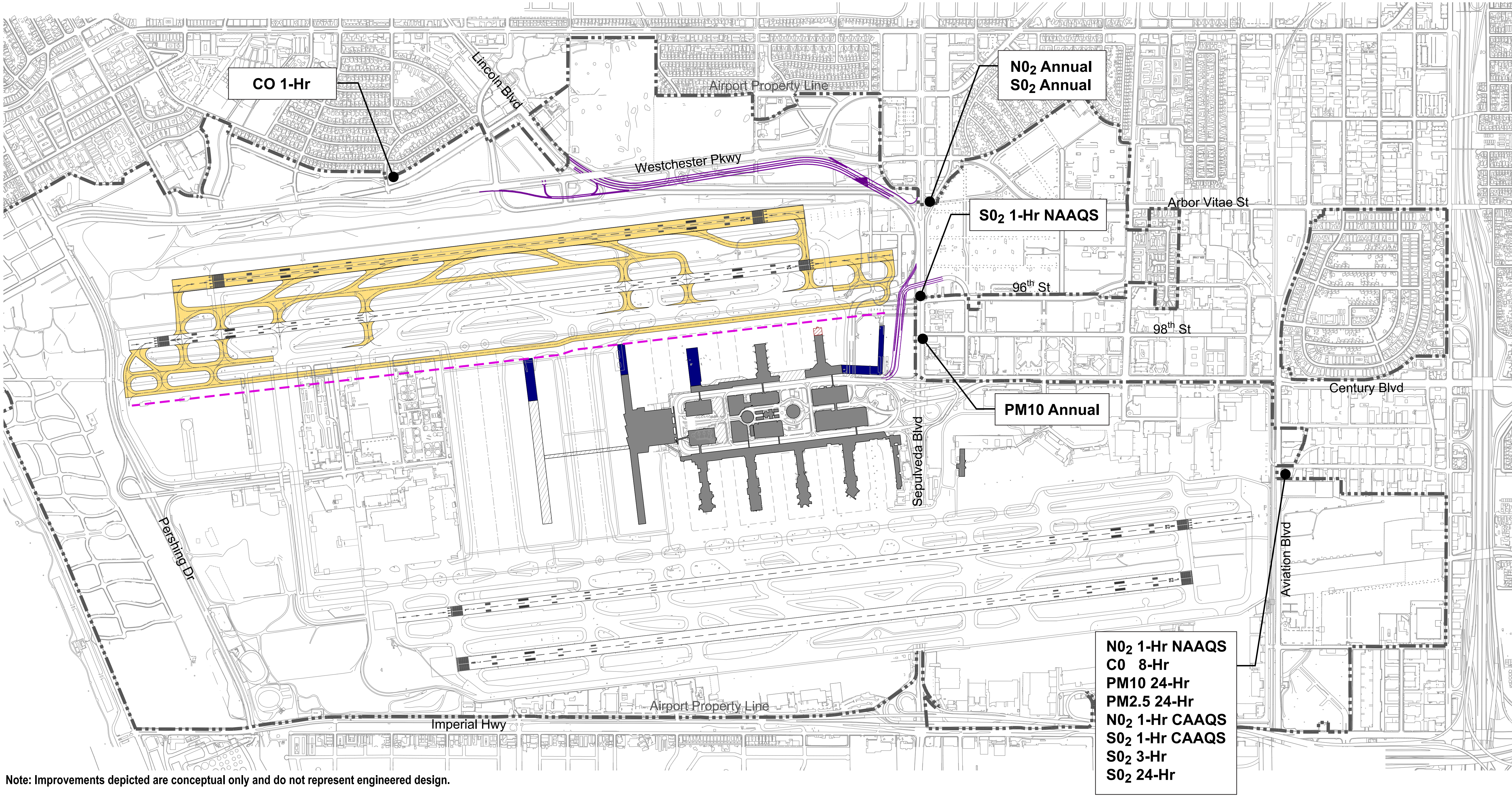

Note: Improvements depicted are conceptual only and do not represent engineered design.

0 1,500 ft
Scale
north

Source: CDM Smith, 2012.

LAX Specific Plan Amendment Study Draft EIR	Peak Operational Concentrations Locations Alternative 6	Figure 4.2-7

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The estimated operational concentrations shown in **Table 4.2-15** for Alternative 7 indicate that the 1-hour NO_2 CAAQS and NAAQS would be exceeded; all other NAAQS or CAAQS for CO, NO_2, and SO_2 would not be exceeded. In addition, the project incremental concentrations shown in **Table 4.2-16** indicate that PM10 and PM2.5 concentrations under Alternative 7 would exceed the SCAQMD significance thresholds.

Implementation of Alternative 6 would exceed the 1-hour NAAQS for NO_2, the 1-hour CAAQS for NO_2, and the SCAQMD significance thresholds for PM10 and PM2.5; therefore, Alternative 6 operational concentrations would be significant for NO_2, PM10, and PM2.5. Aircraft in the takeoff mode would contribute over 95 percent to the peak 1-hour NO_2 concentrations, and the peak 1-hour NO_2 impact locations would be on the LAX property line east of Runway 24L. Aircraft would also be a substantial (approximately 50 percent) source of PM10 and PM2.5, and the peak daily concentrations of PM10 and PM2.5 would occur along the eastern property line downwind of the departure runway (Runway 25R), in the same location as the peak 1-hour concentrations for NO_2. Estimated peak impact locations for each pollutant and averaging period for Alternative 7 are shown in **Figure 4.2-8**.

4.2.6.4.8 Alternative 8

Operational impacts of Alternative 8 in 2025 were analyzed using the methods described in Section 4.2.2.2. Alternative 8 focuses on ground access improvements, such as development of the ITF, use of Manchester Square for a CONRAC and parking, connecting these facilities to the CTA via an elevated/dedicated busway, and creating an additional parking lot on the Avis facility (east of Lot C). The ground access configuration under Alternative 8 could ostensibly be paired with the airfield and terminal configurations proposed under Alternatives 1, 2, 5, 6, or 7. Therefore, for comparison purposes with other alternatives (i.e., fully integrated alternatives that include airfield, terminal, and ground access improvements combined), a range of project concentrations for Alternative 8 is presented in **Tables 4.2-15** and **4.2-16**.

The estimated operational concentrations shown in **Table 4.2-15** for Alternative 8 indicate that the 1-hour NO_2 CAAQS and NAAQS would be exceeded; all other NAAQS or CAAQS for CO, NO_2, and SO_2 would not be exceeded. In addition, the project incremental concentrations shown in **Table 4.2-16** indicate that PM10 and PM2.5 concentrations under Alternative 8 would exceed the SCAQMD significance thresholds.

Predicted concentrations of NO_2, PM10, and PM2.5, resulting from implementation of Alternative 8 would be significant. The peak impact locations for each pollutant for Alternative 8 would be similar to Alternatives 1, 2, 5, 6, or 7, depending on which airfield and terminal configuration option is selected.

4.2.6.4.9 Alternative 9

Operational impacts of Alternative 9 in 2025 were analyzed using the methods described in Section 4.2.2.2. Alternative 9 focuses on ground access improvements, such as development of the ITF, use of Manchester Square for a CONRAC and parking, connecting these facilities to the CTA via an APM, and creating an additional parking lot on the Avis facility (east of Lot C). The ground access configuration under Alternative 9 could ostensibly be paired with the airfield and terminal configurations proposed under Alternatives 1, 2, 5, 6, or 7. Therefore, for comparison purposes with other alternatives (i.e., fully integrated alternatives that include airfield, terminal, and ground access improvements combined), a range of project concentrations for Alternative 9 is presented in **Tables 4.2-15** and **4.2-16**.

The estimated operational concentrations shown in **Table 4.2-15** for Alternative 9 indicate that the 1-hour NO_2 CAAQS and NAAQS would be exceeded; all other NAAQS or CAAQS for CO, NO_2, and SO_2 would not be exceeded. In addition, the project incremental concentrations shown in **Table 4.2-16** indicate that PM10 and PM2.5 concentrations under Alternative 9 would exceed the SCAQMD significance thresholds.

Predicted concentrations of NO_2, PM10, and PM2.5, resulting from implementation of Alternative 9 would be significant. The peak impact locations for each pollutant for Alternative 9 would be similar to Alternatives 1, 2, 5, 6, or 7, depending on which airfield and terminal configuration option is selected.

4.2.6.5 Summary of Significance Determinations

Table 4.2-17 and the text below summarizes the above conclusions regarding significant air quality impacts, all of which are based on the comparisons to baseline (2009) conditions.

Table 4.2-17

Summary of Air Quality Impacts After Mitigation

	Alternative								
	Alt. 1	**Alt. 2**	**Alt. 3**	**Alt. 4**	**Alt. 5**	**Alt. 6**	**Alt. 7**	**Alt. 8**	**Alt. 9**
Construction Emissions									
CO	SU	SU	SU	LS	SU	SU	SU	SU	SU
VOC	SU	SU	SU	LS	SU	SU	SU	SU	SU
NO_x	SU	SU	SU	SU	SU	SU	SU	SU	SU
SO_2	LS	LS	LS	LS	LS	LS	LS	LS	LS
PM10	SU	SU	SU	SU	SU	SU	SU	SU	SU
PM2.5	SU	SU	SU	LS	SU	SU	SU	SU	SU
Construction Concentrations									
CO	LS	LS	LS	LS	LS	LS	LS	LS	LS
NO_2	SU	SU	SU	SU	SU	SU	SU	SU	SU
SO_2	LS	LS	LS	LS	LS	LS	LS	LS	LS
PM10	SU	SU	SU	SU	SU	SU	SU	SU	SU
PM2.5	LS	LS	LS	LS	LS	LS	LS	LS	LS
Operational Emissions									
CO	LS	LS	LS	LS	LS	LS	LS	LS	LS
VOC	LS	LS	LS	LS	LS	LS	LS	LS	LS
NO_x	LS	LS	LS	LS	LS	LS	LS	LS	LS
SO_2	SU	SU	SU	SU	SU	SU	SU	SU	SU
PM10	SU	SU	SU	SU	SU	SU	SU	SU	SU
PM2.5	SU	SU	SU	SU	SU	SU	SU	SU	SU
Operational Concentrations									
CO	LS	LS	LS	LS	LS	LS	LS	LS	LS
NO_2	SU	SU	SU	SU	SU	SU	SU	SU	SU
SO_2	LS	LS	LS	LS	LS	LS	LS	LS	LS
PM10	SU	SU	SU	SU	SU	SU	SU	SU	SU
PM2.5	SU	SU	SU	SU	SU	SU	SU	SU	SU

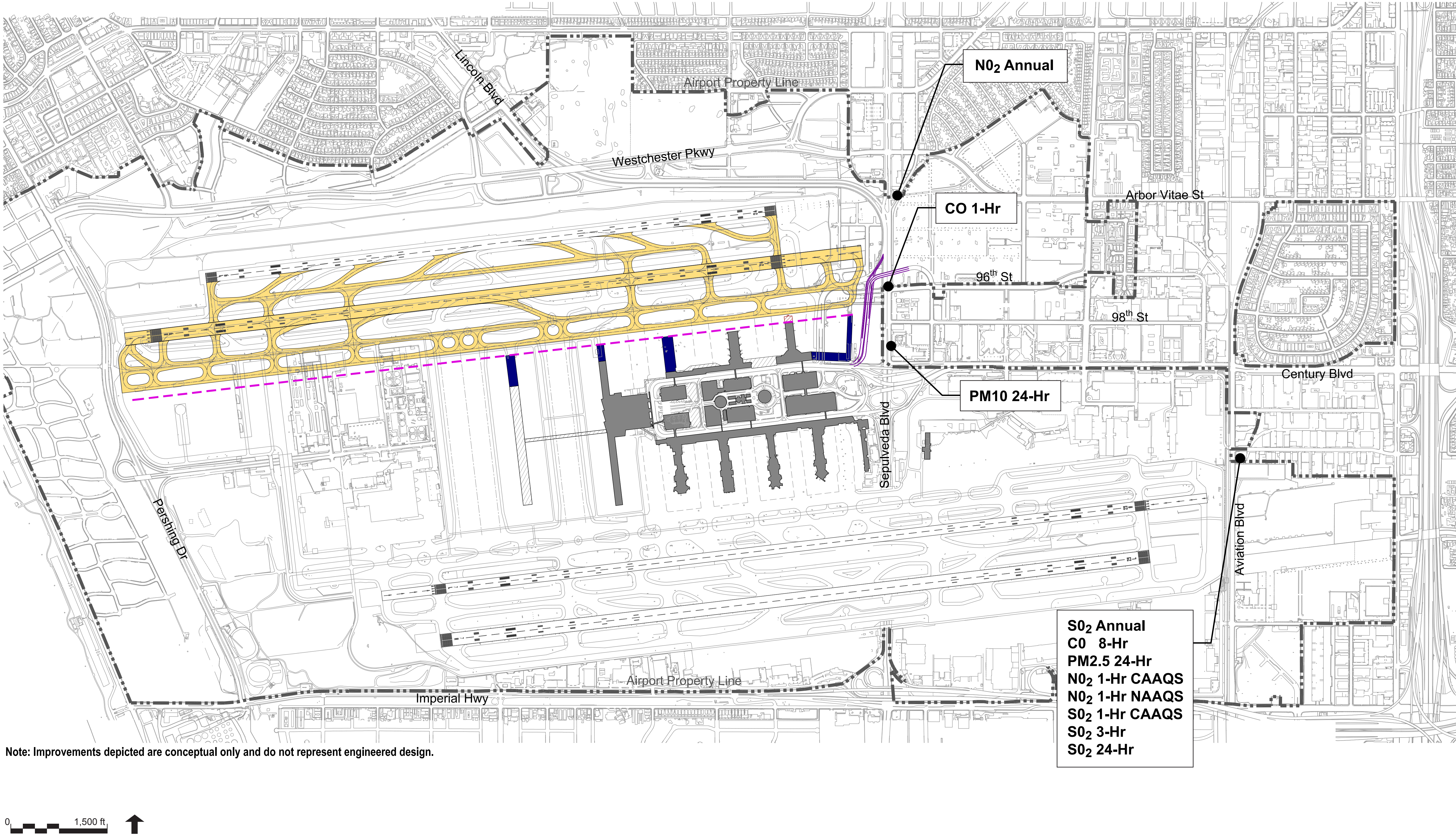
Notes:

LS = Less than Significant Impact
SU = Significant Unavoidable Impact
Mitigation measures are LAX Master Plan Mitigation Measures MM-AQ-1, MM-AQ-2, MM-AQ-3, MM-AQ-4, and components from Section X, Air Quality, of the LAX Master Plan Community Benefits Agreement.

Source: CDM Smith, 2012.

4.2.6.5.1 Alternative 1

Alternative 1 construction emissions of CO, VOC, NO_x, PM10, and PM2.5 would be significant. Construction-related concentrations would be significant for NO_2 and PM10. Operational emissions of SO_2, PM10, and PM2.5 would be significant, and operational concentrations of NO_2, PM10, and PM2.5 resulting from implementation of Alternative 1 would be significant. Therefore, air quality impacts of Alternative 1 would be significant for CO, VOC, NO_x, NO_2, SO_2, PM10, and PM2.5.



Note: Improvements depicted are conceptual only and do not represent engineered design.

Source: CDM Smith, 2012.

Peak Operational Concentrations Locations
Alternative 7

Figure
4.2-8

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4.2.6.5.2 Alternative 2

Alternative 2 construction emissions of CO, VOC, NO_x, PM10, and PM2.5 would be significant. Construction-related concentrations would be significant for NO_2 and PM10. Operational emissions of SO_2, PM10, and PM2.5 would be significant, and operational concentrations of NO_2, PM10, and PM2.5 resulting from implementation of Alternative 2 would be significant. Therefore, air quality impacts of Alternative 2 would be significant for CO, VOC, NO_x, NO_2, SO_2, PM10, and PM2.5.

4.2.6.5.3 Alternative 3

Alternative 3 construction emissions of CO, VOC, NO_x, PM10, and PM2.5 would be significant. Construction-related concentrations would be significant for NO_2 and PM10. Operational emissions of SO_2, PM10, and PM2.5 would be significant, and operational concentrations of NO_2, PM10, and PM2.5 resulting from implementation of Alternative 3 would be significant. Therefore, air quality impacts of Alternative 3 would be significant for CO, VOC, NO_x, NO_2, SO_2, PM10, and PM2.5.

4.2.6.5.4 Alternative 4

Alternative 4 construction emissions of NO_x and PM10 would be significant. Construction-related concentrations would be significant for NO_2 and PM10. Operational emissions of SO_2, PM10, and PM2.5 would be significant, and operational concentrations of NO_2, PM10, and PM2.5 resulting from implementation of Alternative 4 would be significant. Therefore, air quality impacts of Alternative 4 would be significant for NO_x, NO_2, SO_2, PM10, and PM2.5.

4.2.6.5.5 Alternative 5

Alternative 5 construction emissions of CO, VOC, NO_x, PM10, and PM2.5 would be significant. Construction-related concentrations would be significant for NO_2 and PM10. Operational emissions of SO_2, PM10, and PM2.5 would be significant, and operational concentrations of NO_2, PM10, and PM2.5 resulting from implementation of Alternative 5 would be significant. Therefore, air quality impacts of Alternative 5 would be significant for CO, VOC, NO_x, NO_2, SO_2, PM10, and PM2.5.

4.2.6.5.6 Alternative 6

Alternative 6 construction emissions of CO, VOC, NO_x, PM10, and PM2.5 would be significant. Construction-related concentrations would be significant for NO_2 and PM10. Operational emissions of SO_2, PM10, and PM2.5 would be significant, and operational concentrations of NO_2, PM10, and PM2.5 resulting from implementation of Alternative 6 would be significant. Therefore, air quality impacts of Alternative 6 would be significant for CO, VOC, NO_x, NO_2, SO_2, PM10, and PM2.5.

4.2.6.5.7 Alternative 7

Alternative 7 construction emissions of CO, VOC, NO_x, PM10, and PM2.5 would be significant. Construction-related concentrations would be significant for NO_2 and PM10. Operational emissions of SO_2, PM10, and PM2.5 would be significant, and operational concentrations of NO_2, PM10, and PM2.5 resulting from implementation of Alternative 7 would be significant. Therefore, air quality impacts of Alternative 7 would be significant for CO, VOC, NO_x, NO_2, SO_2, PM10, and PM2.5.

4.2.6.5.8 Alternative 8

Alternative 8 construction emissions of CO, VOC, NO_x, PM10, and PM2.5 would be significant. Construction-related concentrations would be significant for NO_2 and PM10. Operational emissions of SO_2, PM10, and PM2.5 would be significant, and operational concentrations of NO_2, PM10, and PM2.5 resulting from implementation of Alternative 8 would be significant. Therefore, air quality impacts of Alternative 8 would be significant for CO, VOC, NO_x, NO_2, SO_2, PM10, and PM2.5.

4.2.6.5.9 Alternative 9

Alternative 9 construction emissions of CO, VOC, NO_x, PM10, and PM2.5 would be significant. Construction-related concentrations would be significant for NO_2 and PM10. Operational emissions of SO_2, PM10, and PM2.5 would be significant, and operational concentrations of NO_2, PM10, and PM2.5 resulting from implementation of Alternative 9 would be significant. Therefore, air quality impacts of Alternative 9 would be significant for CO, VOC, NO_x, NO_2, SO_2, PM10, and PM2.5.

4.2.7 Mitigation Measures

With respect to all construction-related impacts from air emissions associated with the SPAS project, LAWA is committed to mitigating temporary construction-related emissions to the maximum extent feasible and has established some of the most aggressive construction emissions reduction measures in Southern California, particularly with regard to requiring construction equipment to be equipped with emissions control devices. The framework identified in the MPAQ for reducing air emissions associated with construction of the Master Plan and the specific means for implementing the mitigation measures described in Section 4.2.5, as well as all of the measures identified in Table 4.2-8, would be used to reduce air emissions associated with implementation of the SPAS project. These mitigation measures establish a commitment and process for incorporating all technically feasible air quality mitigation measures into each component of the SPAS project as each element of that project is constructed. At a programmatic level, this provides the most comprehensive means of ensuring air emissions will be reduced to the maximum extent feasible. In addition, the *LAWA Sustainable Airport Planning, Design and Construction Guidelines* encourages contractors to implement a number of voluntary measures that would reduce criteria pollutant and greenhouse gas emissions. Through the sustainability program, contractors are encouraged to implement such measures as: further reduce vehicle and equipment idling times; comply with Tier 4 emission standards for non-road diesel equipment; retrofit existing diesel equipment with particulate filters and oxidation catalysts; replace aging equipment with new low-emission models; and consider the use of alternative fuels for construction equipment. There are no feasible measures that could be adopted at this time to reduce air emissions further. Therefore, no additional project-specific mitigation measures are recommended in connection with SPAS.

It is estimated that all of the alternatives would have significant impacts relative to operational emissions of SO_2, operational concentrations of NO_2, and operational concentrations of SO_2. As indicated in the impacts discussion above, the vast majority (over 95 percent) of the emissions contributing to those significant impacts (i.e., causing exceedances of the applicable 1-hour CAAQS and NAAQS) would occur from aircraft during takeoff. Other than potential future improvements in aircraft engine technology and associated reductions in air pollutant emissions, there are no feasible means to mitigate emissions during aircraft takeoff because the only measures are related to aircraft operational options, such as reduced thrust take-off, which are at the sole discretion of the pilot. However, as noted above, LAWA is committed to mitigating operational air quality impacts to the maximum extent feasible. The specific measures (i.e., MM-AQ-3, Transportation-Related Mitigation Measures, and MM-AQ-4, Operations-Related Mitigation Measures) described in Section 4.2.5 would also be applied to the SPAS project. Although these measures would not mitigate operational impacts to a level that is less than significant, they would reduce impacts associated with the SPAS alternatives to the maximum extent feasible. When the specific elements of the SPAS project are implemented, additional project-specific mitigation measures may be identified to further reduce air quality impacts.

4.2.8 Level of Significance After Mitigation

Even with implementation of feasible construction-related mitigation measures, the maximum daily construction-related emissions associated with all of the alternatives, except Alternative 4, would be significant for CO, VOC, NO_x, PM10, and PM2.5. The maximum daily construction-related emissions associated with Alternative 4 would be significant for NO_x and PM10. Construction-related concentrations of NO_2 and PM10 would be significant for all alternatives.

Even with implementation of feasible operations-related mitigation measures, the maximum daily operational emissions associated with all of the alternatives would be significant for SO_2, PM10, and PM2.5. Operational concentrations of NO_2, PM10, and PM2.5 would be significant for all alternatives.

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