4.3 AIR QUALITY

This section contains information about air quality in the Specific Plan Area. It provides an overview of the current regulatory framework, describes existing conditions, and analyzes the potential impacts of the proposed Specific Plan. Greenhouse gas emissions are discussed separately in Section 4.7 of the EIR.

A. Regulatory Framework

This section describes the regulatory setting as it relates to air quality in the Ravenswood/4 Corners Transit-Oriented Development Specific Plan area. Regulatory oversight for air quality in the San Francisco Bay Air Basin is provided by the Environmental Protection Agency Region IX office at the federal level, the California Air Resources Board (CARB) at the State level, and the Bay Area Air Quality Management District (BAAQMD) at the regional level.

1. Federal Agencies, Laws and Regulations

a. U.S. Environmental Protection Agency and the Federal Clean Air Act

The U.S. Environmental Protection Agency (EPA) is responsible for implementing the Federal Clean Air Act (FCAA), which was first enacted in 1955 and amended numerous times thereafter. The FCAA established federal air quality standards known as the National Ambient Air Quality Standards (NAAQS). These standards identify levels of air quality for "criteria pollutants" that are considered the maximum levels of ambient (background) air pollutants considered safe, with an adequate margin of safety, to protect the public health and welfare. The "criteria pollutants" regulated by the NAAQS are: ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter (PM_{10}), fine particulate matter ($PM_{2.5}$), and lead (Pb). Key air pollutants are discussed below in section B.

The U.S. EPA regulates emission sources that are under the exclusive authority of the federal government, such as aircraft, ships, and certain types of locomotives. The U.S. EPA has jurisdiction over emission sources outside State waters, beyond the outer continental shelf. It also establishes various emis-

sion standards, including those for vehicles sold in states other than California. Automobiles sold in California must meet the stricter emission standards established by CARB, as described below. State and federal ambient air quality standards are listed in Table 4.3-1.

2. State Agencies, Laws and Regulations

In addition to federal requirements, air quality in California is also governed by more stringent regulations under the California Clean Air Act.

a. California Clean Air Act

Approved in 1988, the California Clean Air Act (CCAA) requires that each local air district prepare and maintain an Air Quality Management Plan to achieve compliance with the California Ambient Air Quality Standards (CAAQS). The amendments to the CCAA establish the CAAQS and a legal mandate to achieve these standards by the earliest practical date. These standards apply to the same criteria pollutants as those regulated under the Federal Clean Air Act and also include sulfate, visibility-reducing particles, hydrogen sulfide, and vinyl chloride. These standards are generally more stringent and apply to more pollutants than the NAAQS.

In addition to the criteria pollutants, CAAQS have been established for visibility-reducing particulates, hydrogen sulfide, and sulfates. The CCAA requires that each local air district prepare and maintain an Air Quality Management Plan (AQMP) to achieve compliance with CAAQS. These AQMPs also serve as the basis for preparation of the State Implementation Plan (SIP) for the State of California. See Table 4.3-1 for State and federal ambient air quality standards.

b. California Air Resources Board

The California Air Resources Board (CARB) administers the air quality standards in California. CARB regulates mobile air pollution sources, such as motor vehicles. The agency is responsible for setting emission standards for vehicles sold in California and for other emission sources, such as consumer products and certain off-road equipment. CARB has also established passen-

ger vehicle fuel specifications. Similar to the U.S. EPA, the CARB designates areas within California as either attainment or nonattainment for each criteria pollutant based on whether the CAAQS have been achieved. Under the CCAA, areas are designated as nonattainment for a pollutant if air quality data shows that a State standard for the pollutant was violated at least once during the previous three calendar years.

CARB oversees the functions of local air pollution control districts and air quality management districts, which in turn administer air quality activities at the regional and county level.

3. Regional and City Agencies and Regulations

a. Bay Area Air Quality Management District

In 1955, the California Legislature created the Bay Area Air Quality Management District (BAAQMD). The agency is primarily responsible for assuring that the national and State ambient air quality standards are attained and maintained in the Bay Area. The BAAQMD regulates air quality within East Palo Alto. The BAAQMD is responsible for many other activities, including:

- Adopting and enforcing rules and regulations concerning air pollutant sources.
- Issuing permits for stationary sources of air pollutants.
- Inspecting stationary sources of air pollutants.
- Responding to citizen complaints.
- Monitoring ambient air quality and meteorological conditions.
- Awarding grants to reduce motor vehicle emissions.
- Conducting public education campaigns.

i. Air Pollutants and Ambient Air Quality Standards[1]

Federal and State air quality standards resulting from the federal and California Clean Air Acts are shown in Table 4.3-1. Both the federal and California ambient air quality standards have been adopted by the BAAQMD.

[1] California Air Resources Board (CARB), http://www.arb.ca.gov/desig/desig.htm, accessed on July 10, 2009.

a) Carbon Monoxide

CO, a colorless and odorless gas, interferes with the transfer of oxygen to the brain. It can cause dizziness and fatigue and can impair central nervous system functions. CO is emitted almost exclusively from the incomplete combustion of fossil fuels. Automobile exhaust and residential wood burning in fireplaces and woodstoves emit most of the CO in the Bay Area. CO is a non-reactive air pollutant that dissipates relatively quickly, so ambient CO concentrations generally follow the spatial and temporal distributions of vehicular traffic. The highest CO concentrations are typically recorded during the winter.

b) Ozone

Ground-level O_3 is the principal component of smog. Ozone is not directly emitted into the atmosphere, but instead forms through a photochemical reaction of reactive organic gases (ROG) and NO_X, which are known as O_3 precursors. Ozone levels are highest from late spring through autumn, when precursor emissions are high and meteorological conditions are warm and stagnant. Motor vehicles create the majority of ROG and NO_X emissions in the Bay Area. Exposure to levels of O_3 above current ambient air quality standards can lead to human health effects such as lung inflammation and tissue damage, as well as impaired lung functioning. Ozone exposure is also associated with symptoms such as coughing, chest tightness, shortness of breath, and the worsening of asthma symptoms. The greatest risk for harmful health effects is borne by outdoor workers, athletes, and children, as well as others who spend time outdoors during smoggy periods. Elevated O_3 levels can reduce crop and timber yields, as well as damage native plants. Ozone can also damage materials such as rubber, fabrics, and plastics.

In April 2005, CARB approved a new 8-hour standard of 0.070 parts per million (ppm) and retained the 1-hour O_3 standard of 0.09 ppm after an extensive review of the scientific literature. Evidence from the reviewed studies indicates that significant harmful health effects could occur among both adults and children if exposed to levels above these standards. In 2008, the U.S. EPA revised the 8-hour standard to 0.075 ppm for 8-hour exposures.

TABLE 4.3-1 ***STATE AND FEDERAL AMBIENT AIR QUALITY STANDARDS***

Pollutant	Averaging Time	State Standards	Federal Standards	
			Primary[a]	Secondary[b]
Ozone	8-Hour	0.070 ppm[c] (137 $\mu g/m^3$)[d]	0.075 ppm (147 $\mu g/m^3$)	—
	1-Hour	0.09 ppm (180 $\mu g/m^3$)	—[e]	Same as primary
Carbon monoxide	8-Hour	9.0 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	—
	1-Hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	—
Nitrogen dioxide	Annual	—	0.053 ppm (100 $\mu g/m^3$)	Same as primary
	1-Hour	0.18 ppm (339 $\mu g/m^3$)	—	—
Sulfur dioxide	Annual	—	0.03 ppm (80 $\mu g/m^3$)	—
	24-Hour	0.04 ppm (105 $\mu g/m^3$)	0.14 ppm (365 $\mu g/m^3$)	—
	3-Hour	—	—	0.5 ppm (1,300 $\mu g/m^3$)
	1-Hour	0.25 ppm (655 $\mu g/m^3$)	—	—
PM_{10}	Annual	20 $\mu g/m^3$ (geometric mean)	—[f]	Same as primary
	24-Hour	50 $\mu g/m^3$	150 $\mu g/m^3$	Same as primary
$PM_{2.5}$	Annual	12 $\mu g/m^3$	15 $\mu g/m^3$	—
	24-Hour	—	35 $\mu g/m^3$	—
Lead	Calendar Quarter	—	1.5 $\mu g/m^3$	Same as primary
	30-Day Average	1.5 $\mu g/m^3$	—	—

Notes: Concentrations are expressed first in units in which the standards were promulgated. Equivalent units given in parentheses. (a) Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health. Each state must attain the primary standards no later than three years after that State's implementation plan is approved by the U.S. EPA. (b) Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant. (c) ppm: parts per million. (d) ug/m3: Micrograms per cubic meter. (e) The national 1-hour O3 standard was revoked by the U.S. EPA on June 15, 2005. (f) The annual PM10 standard was revoked by the U.S. EPA on September 21, 2006, and a new PM2.5 24-hour standard was established.
Source: CARB, 2005.

c) Nitrogen Dioxide

NO_2 is visible as a reddish-brown gas. It is both reactive and oxidizing. It can damage the cells lining the respiratory tract and cause breathing difficulties as a result, especially in asthmatics. This pollutant is also an essential ingredient in the formation of ground-level ozone pollution. NO_2 is one of the nitrogen oxides emitted from high-temperature combustion processes, such as those occurring in trucks and cars. In the presence of sunlight, complex reactions of nitrogen oxides with ozone and other air pollutants produce the majority of NO_2 in the atmosphere. Indoors, home heaters and gas stoves also produce substantial amounts of NO_2. Nitrogen oxide (NO) and NO_2 are collectively referred to as nitrogen oxides (NO_x) and are major contributors to O_3 formation. NO_2 also contributes to the formation of PM_{10}, which is discussed below.

d) Sulfur Dioxide

Sulfur dioxide is a colorless gas with a strong odor. It can damage materials through acid deposition. It is produced by the combustion of sulfur-containing fuels, such as oil and coal. Refineries, chemical plants, and pulp mills are the primary industrial sources of sulfur dioxide emissions. Sulfur dioxide concentrations in the Bay Area are well below the ambient standards, and therefore are not a concern to regulators with jurisdiction over East Palo Alto. Adverse health effects associated with exposure to high levels of sulfur dioxide include aggravation of chronic obstructive lung disease, as well as increased risk of acute and chronic respiratory illness.

e) Lead

Lead occurs in the atmosphere as particulate matter. It was primarily emitted by gasoline-powered motor vehicles, although the use of lead in fuel has been virtually eliminated. As a result, levels in the Bay Area have dropped dramatically. Lead concentrations in the Bay Area are well below the ambient standards.

f) Suspended Particulate Matter

PM is a complex mixture of tiny particles that include dry solid fragments, solid cores with liquid coatings, and small droplets of liquid. These particles

vary greatly in shape, size, and chemical composition, and can be made up of many different materials such as metals, soot, soil, and dust. Particles 10 microns or less in diameter are considered to be respirable, or breathable, particulate matter, and are referred to as PM_{10}. Fine particles are 2.5 microns or less in diameter ($PM_{2.5}$) and can contribute significantly to regional haze and reduction of visibility. The buildup of these pollutants is greatest during the evenings and early morning periods. Over an entire year, the Bay Area experiences the highest PM_{10} and $PM_{2.5}$ in winter, when wood smoke and ammonium nitrate contributions to particulate matter are highest.

Although particulates are found naturally in the air, most particulate matter occurring in the Bay Area is emitted either directly or indirectly by motor vehicles, industry, construction, agricultural activities, and wind erosion of disturbed areas. Most $PM_{2.5}$ is composed of combustion products, such as smoke and traffic exhaust. Extensive research reviewed by CARB indicates that exposure to outdoor PM_{10} and $PM_{2.5}$ levels exceeding current ambient air quality standards is associated with increased risk of hospitalization for lung and heart-related respiratory illness, including emergency room visits for asthma. PM exposure is also associated with increased risk of premature deaths, especially in the elderly and people with pre-existing cardiopulmonary disease. In children, studies have shown associations between PM exposure and reduced lung function and increased respiratory symptoms and illnesses. Besides reducing visibility, the acidic portion of PM, including nitrates and sulfates, can harm crops and forests, as well as aquatic and other ecosystems.

In June 2002, CARB adopted new ambient air quality standards for PM_{10} and $PM_{2.5}$, resulting from an extensive review of health-based scientific literature. In 2006, the U.S. EPA updated the 24-hour standard for $PM_{2.5}$ and eliminated the annual PM_{10} standard.

g) Toxic Air Contaminants

Toxic air contaminants (TACs) are a broad class of compounds known to cause morbidity or mortality, usually because they cause cancer. They include, but are not limited to, the criteria air pollutants listed above. TACs are

found in ambient air, especially in urban areas, and can be caused by industry, agriculture, fuel combustion, and commercial operations. TACs are typically found in low concentrations, even near their source; for example, while diesel particulate matter and benzene may be present near a freeway, the concentration of these materials in the air is typically low. However, chronic exposure to these low levels can result in adverse health effects. As a result, TACs are regulated at the regional, State, and federal level.

CARB has identified the diesel particulate matter (DPM) portion of diesel exhaust as a significant TAC. DPM is the predominant TAC in urban air and is estimated to represent about two-thirds of the age-adjusted cancer risk from TACs, based on the statewide average. Diesel exhaust is a complex mixture of gases, vapors, and fine particles. Because of this complexity, the evaluation of diesel exhaust's precise health effects is a complicated scientific issue. One issue that is clear is that some of the chemicals in diesel exhaust, such as benzene and formaldehyde, have been previously identified as TACs by CARB, and are listed as carcinogens either under the State's Proposition 65, also known as the Safe Drinking Water and Toxic Enforcement Act of 1986, or under the federal Hazardous Air Pollutants program. It is also the case that federal and State regulations are in place to mitigate the health risks created by DPM emissions. California has adopted a comprehensive diesel risk reduction program, and the U.S. EPA adopted low-sulfur diesel fuel standards that went into effect in June 2006, reducing diesel particulate matter substantially. Furthermore, CARB recently adopted regulations that require fleet owners of off-road construction equipment or on-road trucks to retrofit or replace their fleets to reduce overall DPM emissions.

In cooler weather, smoke from residential wood combustion can be a source of TACs. Localized high TAC concentrations can result when cold, stagnant air traps smoke near the ground. When there is no wind, this pollution can persist for many hours. This condition typically occurs in sheltered valleys during the winter. Wood smoke, which contains a significant amount of PM_{10} and $PM_{2.5}$, is an irritant and is known to worsen asthma and other chronic lung problems.

ii. Air Quality Planning

This section describes programs in California and the Bay Area that are intended to aid compliance with federal and State air quality standards.

b. Clean Air Plans

To protect public health, BAAQMD has adopted plans to achieve ambient air quality standards. BAAQMD must continuously monitor its progress in implementing attainment plans and must periodically report to CARB and the U.S. EPA. It must also periodically revise its attainment plans to reflect new conditions and requirements.

In 1991, the BAAQMD, MTC, and ABAG prepared the Bay Area 1991 Clean Air Plan. This air quality plan addresses the California Clean Air Act. Updates are developed approximately every three years. The plans are meant to demonstrate progress toward meeting the more stringent 1-hour ozone CAAQS. In 2010, BAAQMD adopted the Bay Area 2010 Clean Air Plan. This Clean Air Plan updates the most recent ozone plan, the 2005 Ozone Strategy. Unlike previous Bay Area Clean Air Plans, the 2010 Clean Air Plan is a multi-pollutant air quality plan addressing four categories of air pollutants:

- Ground-level ozone and key ozone precursor pollutants (reactive organic gases and NOx), as required by State law;
- Particulate matter, primarily PM2.5, as well as the precursors to secondary PM2.5;
- Toxic air contaminants; and
- Greenhouse gases.

While the Clean Air Plan addresses State requirements, it will also provide the basis for developing future control plans to meet federal requirements (NAAQS) for ozone and PM2.5. The region is required to prepare (by December 2012) a federally enforceable plan to meet the NAAQS for PM2.5. In addition, U.S. EPA is likely to adopt a more stringent NAAQS for O_3.

These new standards will likely trigger new planning requirements for the Bay Area and more stringent federally enforceable control measures.

While previous Clean Air Plans have relied upon a combination of stationary and transportation control measures, the 2010 Clean Air Plan adds two new types of control measures: (1) Land Use and Local Impact Measures, and (2) Energy and Climate Measures. These types of measures would indirectly reduce air pollutant and greenhouse gas emissions through reductions in vehicle and energy usage. In addition, the plan includes Further Study Measures, which will be evaluated as potential control measures.

The Bay Area 2010 Clean Air Plan proposes expanded implementation of transportation control measures (TCMs), and includes public outreach programs designed to educate the public about air pollution in the Bay Area and promote individual behavior changes that improve air quality. New measures in the Clean Air Plan are aimed at helping guide land use policies that would indirectly reduce air pollutant emissions. Some of these measures or programs rely on local governments for implementation. The clean air planning efforts for O_3 also will reduce PM_{10} and $PM_{2.5}$, as a substantial amount of particulate matter comes from combustion emissions such as vehicle exhaust. Conversely, strategies to reduce O_3 precursor emissions will reduce secondary formation of $PM_{2.5}$ and PM_{10}.

The Bay Area 2001 Ozone Attainment Plan was prepared to achieve the 1-hour NAAQS for ozone. Since that plan was submitted, the region was designated as a marginal nonattainment area for the 8-hour ozone NAAQS, and the 1-hour ozone NAAQS was revoked. This plan was a proposed revision to the Bay Area part of California's plan (State Implementation Plan, or SIP) to achieve the 1-hour ozone NAAQS. The plan was prepared in response to the U.S. EPA's partial approval and partial disapproval of the Bay Area's 1999 Ozone Attainment Plan. The U.S. EPA plans to designate the Bay Area as nonattainment with respect to the new 2008 8-hour ozone NAAQS. This would require the region to develop a new Ozone Attainment Plan to meet this standard. A new plan would likely contain many of

the components listed in the 2010 Clean Air Plan described above, since that plan addresses the more stringent State ozone standards.

There is no formal clean air plan addressing PM_{10} or $PM_{2.5}$. However, the clean air planning efforts for ozone will also reduce PM_{10} and $PM_{2.5}$, since a substantial amount of this air pollutant comes from combustion emissions such as vehicle exhaust. In addition, BAAQMD adopts and enforces rules to reduce particulate matter emissions and develops public outreach programs to educate the public to reduce PM_{10} and $PM_{2.5}$ emissions. One such program is the Winter Spare the Air Program, which is similar to the standard Spare the Air program but focuses on $PM_{2.5}$ emissions that result from the use of fireplaces and wood stoves.

In addition, California's Senate Bill 656 (SB 656, Sher, 2003) that amended Section 39614 of the Health and Safety Code, required further action by CARB and air districts to reduce public exposure to PM_{10} and $PM_{2.5}$. Efforts identified by BAAQMD in response to SB 656 are primarily targeting reductions in wood smoke emissions; adoption of new rules to further reduce NOx and particulate matter from internal combustion engines; and reductions in particulate matter from commercial charbroiling activities.

c. CARB Land Use Guidance

In April 2005, CARB released the final version of its *Air Quality and Land Use Handbook: A Community Health Perspective*. This handbook is intended to encourage local land use agencies to consider the risks from air pollution before they approve the siting of sensitive land uses, including residences, near sources of air pollution. CARB makes recommendations regarding the siting of sensitive land uses near freeways, truck distribution centers, rail yards, marine ports, dry cleaners, gasoline dispensing stations, and other air pollution sources. These "advisory" recommendations include general setbacks or buffers from air pollution sources. Unlike industrial or stationary sources of air pollution, the siting of new sensitive land uses does not require air quality

permits or approval by air districts. CARB recommends setbacks of 500 feet between freeways and new sensitive receptors, such as residences.[2]

d. BAAQMD Rules and Regulations

BAAQMD regulates the demolition of buildings and structures that may contain asbestos. Asbestos is a fibrous mineral that occurs naturally in ultramafic rock—a rock type commonly found in California—and was used in the past as a processed component of building materials. Because asbestos has been proven to cause serious adverse health effects, such as asbestosis and lung cancer, it is strictly regulated. The relevant local regulations are found in BAAQMD Regulation 11, Rule 2: Hazardous Materials; Asbestos Demolition, Renovation and Manufacturing.

In addition, BAAQMD adopted Regulation 6, Rule 3, to control particulate matter emissions from wood-burning devices. The rule restricts operation of any indoor or outdoor fireplace, fire pit, wood or pellet stove, masonry heater, or fireplace insert on days during the winter when air quality conditions are forecasted to exceed the NAAQS for $PM_{2.5}$. The rule also limits excess visible emissions from wood-burning devices and requires clean burning technology for wood-burning devices that are sold, resold, or installed in the Bay Area.

BAAQMD's Regulation 7 limits odors from many different sources, excluding restaurants and agricultural practices. The requirements of this Regulation become applicable when BAAQMD receives odor complaints from 10 or more complainants within a 90-day period, alleging that a source has caused odors perceived at or beyond the property line of the source and deemed to be objectionable.

[2] California Air Resources Board, 2005, *Air Quality and Land Use Handbook: A Community Health Perspective*, page 4.

e. BAAQMD Air Quality Guidelines

In May 2011, BAAQMD updated its guidelines to evaluate air quality impacts from projects.[3] These new guidelines include evaluation criteria for siting new sensitive receptors near sources of toxic air contaminants and air pollutants, as well as criteria for evaluating potential odor impacts.

The new guidelines recommend that special overlay zones be developed around existing and proposed sources of toxic air contaminants, and that these overlay zones should be included in General Plans as well as other land use plans. The purpose of the overlay zones is to reduce exposures of sensitive land uses to unhealthy levels of toxic air contaminants, including $PM_{2.5}$, from substantial nearby sources. BAAQMD's new guidelines rely on the guidance from CARB's *Air Quality and Land Use Handbook*, described above. In East Palo Alto, the primary overlay zone would likely be along Highway 101. BAAQMD has also recommended that lead agencies include the effects of major roadways and permitted stationary sources of air pollutants, which could affect the Plan Area.

BAAQMD's new guidelines also provide methods for analyzing the impacts of toxic air contaminant sources to develop more refined overlay zones. These methods rely on modeling specific emissions from the roadways or sources, using emission factor models, dispersion modeling, and health risk criteria to determine where such sources result in significant exposures. These guidelines provide criteria for judging source-specific and cumulative impacts.

The new guidelines also recommend screening distances for various types of odor sources. East Palo Alto does not contain many of these sources, which include wastewater treatment plants, landfills or transfer stations, composting facilities, confined animal facilities, food manufacturing, and chemical plants. However, various industrial businesses in the Ravenswood Business District may produce localized odors.

[3] Bay Area Air Quality Management District (BAAQMD), May 2011, *California Environmental Quality Act Air Quality Guidelines.*

f. BAAQMD CARE Program

BAAQMD initiated its Community Air Risk Evaluation (CARE) program in 2004 to evaluate and reduce health risks associated with exposures to outdoor TACs in the Bay Area. The program examines TAC emissions from point sources; area sources; on-road mobile sources, such as cars and trucks; and off-road mobile sources, such as construction equipment, trains, and aircraft. The CARE program focuses on DPM emissions, which is the major contributor to airborne health risk in California. Its goal is to identify areas with high emissions of TACs that have sensitive populations nearby, then reduce exposure to TACs through new regulations, incentive funding, and other programs.

In Phase I of the program, a 2-kilometer by 2-kilometer gridded inventory of TAC emissions was developed for the year 2000. The data were then updated to include 2005 emission data. This emissions inventory was risk-weighted to reflect the differences in potency of the various TACs. For example, benzene has far higher cancer potency than many other compounds, such as methyl tertiary buytl ether (MTBE). In contrast, while DPM is not as potent as benzene, DPM emissions are much more prevalent. The Phase I study identifies diesel emissions from heavy-duty trucks as a major source of TAC emissions and identifies programs available to reduce these emissions.

In Phase II of the CARE program, BAAQMD is performing regional and local-scale modeling to determine the significant sources of DPM and other TAC emissions locally in priority communities, as well as for the entire Bay Area. The BAAQMD has partnered with CARB, the Port of Oakland, the Pacific Institute, the West Oakland Environmental Indicators Project, and major railroads to prepare specific health risk assessments.

One highlight of the CARE program is the development of a Mitigation Action Plan, in which risk reduction activities are focused on the most at-risk communities. This plan identified six different at-risk communities that would benefit from targeted mitigation, based on TAC emissions and presence of sensitive land uses. One of the six communities is what BAAQMD

refers to as Redwood City/East Palo Alto. This impacted community encompasses all of East Palo Alto, including the Plan Area. The Mitigation Action Plan calls for the following:

- Allocating grant and incentives to the priority communities.
- Conducting outreach efforts to obtain community input about how best to address and reduce TAC emissions.
- Working with local city and county health departments to reduce TAC emissions in priority communities.
- Developing local land use guidance to assist local planners, community members, and developers in assessing risks from land use projects and exposure to mobile and stationary sources of TAC emissions.
- Developing rules and regulations that would require reduction of TAC emissions from significant sources.

In Phase III, BAAQMD plans to conduct an extensive exposure assessment to identify and rank the communities as to their potential TAC exposures and determine the types of activities that place the communities at highest risk. BAAQMD will also pursue additional mitigations and attempt to develop a metric to measure the effectiveness of these efforts. The new BAAQMD CEQA Guidelines included new significance thresholds for community risk and hazards that originated from this process. These new thresholds address both project (single-source) and cumulative exposures.

g. City of East Palo Alto Climate Act Plan

The City of East Palo Alto adopted a Climate Action Plan and Negative Declaration on September 20, 2011.[4] The Climate Action Plan provides a foundation for future efforts by the community to reduce GHGs. Several of these measures would also lower emissions of Criteria Pollutants and TACs.

[4] City of East Palo Alto, September 20, 2011. Staff Report Item No. 29, Climate Action Plan and Initial Study and Negative Declaration.

The Climate Action Plan includes 23 actions to address Climate Change that mostly identify emission reductions and energy and water conservation goals. Those GHG reduction measures and actions were structured around the four general categories of GHG emissions, as identified by the GHG inventory. Numerical targets were set for reducing GHGs in each category.

B. Existing Conditions

1. Climate and Meteorology

The climate of East Palo Alto is characterized by warm, dry summers and cool, moist winters. The proximity of the San Francisco Bay and Pacific Ocean has a moderating influence on the local climate. East Palo Alto is located in the Peninsula climate subregion of the Bay Area.

The major large-scale weather feature controlling the area's climate is a large high pressure system located in the eastern Pacific Ocean, known as the Pacific High. The strength and position of the Pacific High varies seasonally. It is strongest during summer and located off the west coast of the United States. Large-scale atmospheric subsidence associated with the Pacific High produces an elevated temperature inversion along the West Coast. The base of this inversion is usually located from 1,000 to 3,000 feet above mean sea level, depending on the intensity of subsidence and the prevailing weather condition. Vertical mixing is often limited to the base of the inversion, trapping air pollutants in the lower atmosphere. Marine air trapped below the base of the inversion is often condensed into fog or stratus clouds by the cool Pacific Ocean. This condition is typical of the warmer months of the year from roughly May through October. Stratus-type clouds usually form offshore and move into the Bay Area during the evening hours. Stratus clouds also form over the San Francisco Bay during the evening hours. Stratus cover over the Peninsula, including East Palo Alto, is common during late night and early morning hours. As the land warms the following morning, the clouds often dissipate. The stratus cover then redevelops and moves inland late in the day along with an increase in winds. Otherwise, clear skies and dry conditions prevail during summer.

As winter approaches, the Pacific High becomes weaker and shifts south, allowing weather systems associated with the polar jet stream to affect the region. Low pressure systems produce periods of cloudiness, strong shifting winds, and precipitation. The number of days with precipitation can vary greatly from year to year, resulting in a wide range of annual precipitation totals. Precipitation is generally lowest along the Bay, with much higher amounts occurring along south- and west-facing mountain slopes that are west of East Palo Alto. East Palo Alto, which lies on the lee side of the coastal mountains in southern San Mateo County, receives about 15 to 20 inches of precipitation. Mountains to the west receive 30 to 40 inches. Most rainfall occurs from November through April. High-pressure systems are also common in winter with low-level inversions that trap produce cool stagnant conditions. Radiation fog and haze trapped near the surface are common during extended winter periods where high-pressure systems influence the weather.

The proximity of the eastern Pacific High and relatively lower pressure inland produces a prevailing westerly sea breeze along the central and northern California coast for most of the year. As this wind is channeled through the Golden Gate and other topographical gaps to the west, it branches off to the northeast and southeast, following the general orientation of the San Francisco Bay system. Marine air penetrates the eastern Peninsula mainly from the northwest and through gaps in the lower mountains. The prevailing wind in most of East Palo Alto is primarily from a northwest direction, especially during spring and summer. In winter, winds become variable with more of a southeasterly orientation. Nighttime winds and land breezes during the colder months of the year prevail with variable drainage out of the mountainous areas. Wind speeds are highest during the spring and early summer and lightest in fall. Winter storms bring relatively short episodes of strong southerly winds.

Temperatures in East Palo Alto tend to be less extreme compared to inland locations due to the moderating effect of the Pacific Ocean and the Bay. In summer, high temperatures are generally in the high 70s and in the 50s during

winter. Low temperatures range from the 50s in summer to the 30s in winter.

2. Air Pollution Potential

East Palo Alto can experience episodes of high particulate levels in late fall and winter, when the Pacific High can combine with high pressure over the interior regions of the western United States (known as the Great Basin High) to produce extended periods of light winds and low-level temperature inversions. Although less common, this pattern in summer can produce fair weather and very warm temperatures throughout the Bay Area. This condition frequently produces poor atmospheric mixing that results in degraded regional air quality. Ozone standards traditionally are exceeded in downwind portions of the Bay Area when this condition occurs during the warmer months of the year. Emissions from most of the Bay Area, including East Palo Alto, contribute to O_3 ambient air quality violations that occur on up to about 20 days per year.

3. Air Quality Conditions

Air quality is affected by the rate of pollutant emissions and by meteorological conditions such as wind speed, atmospheric stability, and mixing height, all of which affect the atmosphere's ability to mix and disperse pollutants. Long-term variations in air quality typically result from changes in air pollutant emissions, while short-term variations result from changes in atmospheric conditions.

a. Existing Air Pollutant Levels

East Palo Alto is in the western portion of the San Francisco Bay Area Air Basin. The Air Basin includes the counties of San Francisco, Santa Clara, San Mateo, Marin, Napa, Contra Costa, and Alameda, along with the southeast portion of Sonoma County and the southwest portion of Solano County. BAAQMD monitors air pollutant levels continuously throughout the basin. The closest official monitoring station to East Palo Alto is located in Redwood City at 897 Barron Avenue, near Highway 101.

Table 4.3-2 summarizes air quality monitoring data from the Redwood City monitoring station, and from the air basin as a whole. The values in the table reflect the highest air pollutant levels measured from 2005 to 2009. In addition, Table 4-3 provides the number of days in which measured concentrations exceeded the NAAQS or CAAQS. These findings are discussed in greater detail below.

i. Criteria Air Pollutants in the Bay Area

The San Francisco Bay Area Air Basin annually exceeds the NAAQS for ozone and $PM_{2.5}$. The basin also exceeds the more stringent CAAQS requirements for O_3, PM_{10}, and $PM_{2.5}$.

Throughout the basin, the 8-hour ozone NAAQS was exceeded on two to 12 days each year during the last three years, while the more stringent 8-hour CAAQS was exceeded on 9 to 20 days each year. The 1-hour ozone CAAQS was exceeded on 4 to 11 days each year over the past three years. In most cases, the standards were exceeded in downwind portions of the basin, such as Livermore, Concord, and Gilroy. The attainment status of air basins with respect to air pollutants level is based on the most recent three-year data set.

The NAAQS for PM_{10} is not exceeded anywhere in the Bay Area, but the more stringent State standard is routinely exceeded in the Bay Area and most other parts of California. The new NAAQS for $PM_{2.5}$ is exceeded at about half of the monitoring stations in the Bay Area, most often in Vallejo and San Jose. Some monitors in the Bay Area exceed the State annual $PM_{2.5}$ standard. No other air quality standards are exceeded in the Bay Area.

ii. Criteria Air Pollutants in East Palo Alto

While the air quality conditions measured at BAAQMD's Redwood City monitoring station are not identical to conditions in East Palo Alto, no other official monitoring station is closer to the Plan Area. Therefore, this section primarily discusses the air quality findings from the Redwood City monitoring station.

TABLE 4.3-2 ***HIGHEST MEASURED AIR POLLUTANT CONCENTRATIONS***

Pollutant	Average Time	Measured Air Pollutant Levels 2005	2006	2007	2008	2009
Redwood City						
O_3	1-Hour	0.084 ppm	0.085 ppm	0.077 ppm	0.082 ppm	0.087 ppm
	8-Hour	0.061 ppm	0.063 ppm	0.069 ppm	0.069 ppm	0.063 ppm
CO	8-Hour	2.3 ppm	2.4 ppm	2.3 ppm	1.9 ppm	1.8 ppm
NO_2	1-Hour	0.06 ppm	0.07 ppm	0.06 ppm	0.07 ppm	0.06 ppm
	Annual	0.015ppm	0.014ppm	0.013ppm	0.014ppm	0.012ppm
Fine Particulate Matter ($PM_{2.5}$)	24-Hour	31 ug/m^3	*75 ug/m^3*	*45 ug/m^3*	*28 ug/m^3*	*32 ug/m^3*
	Annual	9 ug/m^3	10 ug/m^3	10 ug/m^3	9 ug/m^3	9 ug/m^3
Respirable Particulate Matter (PM_{10})	24-Hour	***81 ug/m^3***	*70 ug/m^3*	*56 ug/m^3*	—	—
	Annual	***21 ug/m^3***	20 ug/m^3	20 ug/m^3	—	—
Bay Area (Basin Summary)						
O_3	1-Hour	***0.12 ppm***	***0.12 ppm***	***0.12 ppm***	***0.12 ppm***	***0.11 ppm***
	8-Hour	***0.09 ppm***	***0.11 ppm***	***0.09 ppm***	***0.09 ppm***	***0.09 ppm***
CO	8-Hour	3.1 ppm	2.9 ppm	2.7 ppm	2.7 ppm	2.9 ppm
NO_2	1-Hour	0.07 ppm	0.11 ppm	0.07 ppm	0.07 ppm	0.07 ppm
	Annual	0.019ppm	0.018ppm	0.017ppm	0.017ppm	0.016ppm
Fine Particulate Matter ($PM_{2.5}$)	24-Hour	**55 ug/m^3**	***75 ug/m^3***	***58 ug/m^3***	***58 ug/m^3***	***46 ug/m^3***
	Annual	12 ug/m^3	11 ug/m^3	11 ug/m^3	11 ug/m^3	10 ug/m^3
Respirable Particulate Matter (PM_{10})	24-Hour	*81 ug/m^3*	*73 ug/m^3*	*78 ug/m^3*	*78 ug/m^3*	*55 ug/m^3*
	Annual	*24 ug/m^3*	*23 ug/m^3*	*26 ug/m^3*	*26 ug/m^3*	*20 ug/m^3*

Notes: ppm = parts per million ug/m^3 = micrograms per cubic meter NA = data not available.
Values reported in ***bold italic*** exceed ambient air quality standard.
PM_{10} monitoring in Redwood City was discontinued in 2008.
Source: BAAQMD, 2004, 2005, 2006, 2007, and 2008.

TABLE 4.3-3 ***SUMMARY OF MEASURED AIR QUALITY EXCEEDANCES***

Pollutant	Standard	Monitoring Station	Days Exceeding Standard 2005	2006	2007	2008	2009
O_3	NAAQS 1-hr	Redwood City	X	X	X	X	X
		Bay Area	X	X	X	X	X
	NAAQS 8-hr	Redwood City	0	0	0	0	0
		Bay Area	5	17	2	12	8
	CAAQS 1-hr	Redwood City	0	0	0	0	0
		Bay Area	9	18	4	9	11
	CAAQS 8-hr	Redwood City	0	0	0	0	0
		Bay Area	9	22	9	20	13
PM_{10}	NAAQS 24-hr	Redwood City	0	0	0	0	0
		Bay Area	0	0	0	0	0
	CAAQS 24-hr	Redwood City	2	2	1	--	--
		Bay Area	6	15	4	--	--
$PM_{2.5}$	NAAQS 24-hr	Redwood City	0	1	1	1	0
		Bay Area	0	10	14	12	11
All Other (CO, NO_2, Lead, SO_2)	All Other	Redwood City	0	0	0	0	0
		Bay Area	0	0	0	0	0

Source: Illingworth & Rodkin, 2009.

The NAAQS and CAAQS for 1- and 8-hour ozone was not exceeded in Redwood City over the last five years. Measured exceedances of the State PM_{10} standards occurred on zero to two sampling days per year over the last five years in Redwood City. PM_{10} sampling was discontinued in Redwood City after 2007.

The older $PM_{2.5}$ NAAQS of 65 $\mu g/m^3$, established in 1997, was not exceeded in Redwood City. However, the new 35 $\mu g/m^3$ standard set in 2006 was exceeded once each year in 2006, 2007, and 2008. $PM_{2.5}$ are measured only once every sixth day, according to a national schedule.

From 2006 to 2007, the Community Development Institute (CDI) operated its own unofficial monitoring station to measure ozone, PM_{10}, and $PM_{2.5}$ levels in East Palo Alto. While technical difficulties prevented this effort from collecting a full year of data, the partial testing results suggest that PM_{10} and $PM_{2.5}$ levels may be higher in East Palo Alto than at BAAQMD's Redwood City monitoring station. Ozone levels, in contrast, are likely to be consistent with the overall levels in the region. Further testing would be needed to learn more about how air quality in East Palo Alto differs from the region as a whole.[5]

The highest carbon monoxide concentrations measured in Redwood City have been well below the national and State ambient standards. However, since automobile emissions are the primary source of carbon monoxide, the highest concentrations would typically be found away from monitoring stations, near congested roadways that carry large volumes of traffic. These are referred to as "hot spots." Other criteria pollutants, such as nitrogen dioxide, sulfur dioxide, and lead, are typically found at low levels at the Redwood City monitoring station and in the rest of the Bay Area. These pollutants should not pose a major air pollution concern in East Palo Alto.

b. Attainment Status

Violations of ambient air quality standards are based on air pollutant monitoring data and are judged for each air pollutant. Areas that do not violate ambient air quality standards are considered to have attained the standard. The Bay Area as a whole does not meet State or federal ambient air quality standards for ground level ozone and $PM_{2.5}$, nor does the Bay Area meet State standards for PM_{10}. These nonattainment issues are discussed further below.

i. NAAQS

Under the Federal Clean Air Act, the U.S. EPA has classified the region as a marginal nonattainment area for the 8-hour O_3 standard. U.S. EPA required the region to attain the standard by 2007. While U.S. EPA has since deter-

[5] SBF Consulting, 2007, *Final Report: East Palo Alto Air Monitoring Project,* pages 13 and 14.

mined that the Bay Area has met this standard, it also required BAAQMD to submit a formal redesignation request and maintenance plan before removing the marginal nonattainment designation. However, BAAQMD did not request a redesignation under the older standard, because in May 2008, U.S. EPA lowered the 8-hour O_3 standard from 0.08 to 0.075 ppm. Final designations based upon the new 0.075 ppm standard were to be made by March 2010. However, U.S. EPA announced that it intends to establish a new O_3 standard in 2011. States will then have to determine attainment status with those new standards and submit plans to attain the new standards for areas designated nonattainment.

The U.S. EPA recently identified the region as a nonattainment area for the 2006 24-hour $PM_{2.5}$ standard of 35 $\mu g/m^3$, because recent monitoring data have found levels above the standard in San Jose and Vallejo. The U.S. EPA's action identified the entire Bay Area Air Basin as a nonattainment area for the standard. However, the formal nonattainment designation has not yet occurred. Once the designation takes effect, the region would likely have until 2012 to develop a plan to attain the standard, and until 2014 to attain the standard.

The Bay Area has met the CO standards for over a decade and is classified as an attainment maintenance area by the U.S. EPA. The U.S. EPA grades the region as unclassified for all other air pollutants, which include PM_{10}.

ii. CAAQS

California's ambient air quality standards are more stringent than the national ambient air quality standards. At the State level, the region is considered a serious nonattainment area for ground level O_3 and a nonattainment area for PM_{10} and $PM_{2.5}$. The region is required to adopt plans on a triennial basis that show progress towards meeting the State ozone standard. The area is considered an attainment area or unclassified for all other pollutants.

c. Toxic Air Contaminants

Concentrations of toxic air contaminants throughout the Bay Area are measured by BAAQMD and CARB. BAAQMD's Redwood City monitoring station is the closest official station that measures these contaminants near East Palo Alto. Typical contaminants measured by BAAQMD include benzene, 1,3-butadiene, carbon tetrachloride, chloroform, ethylene dibromide, ethylene dichloride, MTBE, methylene chloride, acetaldehyde, perchloroethylene, toluene, and 1,3-butadiene.

To evaluate health risks associated with TACs, BAAQMD conducts air quality modeling. This includes an assessment of emissions for the predominant TACs, which include:

- *Diesel Particulate Matter (DPM).* Primary sources include heavy-duty trucks, buses, construction equipment, and electrical generation. BAAQMD estimates that DPM makes up about 80 percent of the emissions that contribute to inhalation cancer risks in the Bay Area.
- *1,3 Butadiene.* Primary sources include on-road motor vehicles. As with carbon monoxide, older model vehicles without adequate catalytic converters have much higher emission rates.
- *Benzene.* Primary sources include on-road motor vehicles and gasoline evaporation.
- *Formaldehyde.* Sources include fuel combustion from a variety of mobile and stationary sources, particularly motor vehicles. Formaldehyde is emitted both directly and indirectly into the atmosphere. It is formed primarily through photochemical oxidation in the atmosphere with elevated levels of ozone and nitrogen oxides.

TACs can pose cancer risks, which are evaluated based on the number of additional cancer cases per million people based on a 70-year lifetime exposure to the annual average concentration of each TAC. As part of BAAQMD's Community Air Risk Evaluation (CARE) program, BAAQMD evaluated inhalation health risks associated with exposure to these TACs. The modeled inhalation cancer risk in East Palo Alto generally ranged from 300 to 400

cases per million. Areas along Highway 101 and Highway 84 have higher risks. More densely urbanized portions of the Bay Area, such as eastern San Francisco and western Oakland, had higher risks of 1,000 in a million. Once it has implemented all of its adopted measures to reduce risk from DPM, CARB predicts that the overall inhalation health risk in the Bay Area will decrease substantially in the near future.

d. Existing Sources of Air Pollution

CARB maintains emissions inventories for each county in California, including San Mateo County, in which East Palo Alto is located. San Mateo County as a whole accounts for about 10 to 14 percent of the daily Bay Area emissions. Traffic accounts for the greatest portion—about 40 to 50 percent—of the County's emissions of ozone precursor pollutants. Area-wide sources, which include construction activities, residential wood smoke, off-road travel, and agriculture, account for the greatest portion of PM_{10} emissions, about 80 percent. These sources also account for over 50 percent of the $PM_{2.5}$ emissions. However, additional $PM_{2.5}$ is formed through reactions of NOx and other gaseous air pollutants in the atmosphere.

C. Standards of Significance

1. CEQA Appendix G Standards

The Plan would have a significant effect on the environment with respect to air quality if it would:

a. Conflict with or obstruct implementation of the applicable air quality plan.

b. Violate any air quality standard or contribute substantially to an existing or projected air quality violation.

c. Result in a cumulatively considerable net increase of any nonattainment pollutant.

d. Expose sensitive receptors to substantial pollutant concentrations.

e. Create objectionable odors affecting a substantial number of people.

2. BAAQMD Standards

BAAQMD has adopted standards of significance to analyze potential air quality impacts in conformance with CEQA. These standards are described in the BAAQMD CEQA Air Quality Guidelines, updated in May 2011.[6] The new guidelines also include thresholds for GHG emissions, which are addressed in Chapter 4.7.

a. Consistency with Clean Air Planning Efforts

According to the BAAQMD Air Quality Guidelines, proposed plans must show over the planning period of the plan that:

- The plan incorporates current air quality plan control measures as appropriate to the plan area; and
- The rate of increase in vehicle miles travelled or vehicle trips (either measure may be used) within the plan area is equal to or lower than the rate of increase in population projected for the proposed Plan.

b. Operation Emissions

The BAAQMD Air Quality Guidelines do not have thresholds related to direct and indirect emissions resulting from plan implementation. Traffic resulting from the implementation of the plan would cause a significant local air quality impact if emissions of CO cause a projected exceedance of the ambient CO State standard of 9.0 ppm for 8-hour averaging period. This would be considered to cause or contribute substantially to an existing or projected air quality violation.

c. Exposure of New Residences to Toxic Air Contaminants

Unlike industrial or stationary sources of air pollution, residential development and other development where sensitive receptors would be located do not require air quality permits. Nonetheless, this type of development can expose people to unhealthy conditions. The BAAQMD Air Quality Guidelines Thresholds of Significance for plans with regard to community risk and hazard impacts are:

[6] BAAQMD. May 2011. *BAAQMD CEQA Air Quality Guidelines*.

- The land use diagram must identify:
  - Special overlay zones around existing and planned sources of TACs and PM (including adopted risk reduction plan areas); and
  - Special overlay zones of at least 500 feet (or Air District-approved modeled distance) on each side of all freeways and high-volume roadways.
- The plan must also identify goals, policies, and objectives to minimize potential impacts and create overlay zones around sources of TACs, PM, and hazards.

d. Odors

Odors are assessed based on the potential of the Plan to result in odor complaints. The BAAQMD Air Quality Guidelines Thresholds of Significance for plans with regard to odor impacts are:

- The land use diagram must identify special overlay zones around existing and planned sources of odors; and
- The plan must identify goals, policies, and objectives to minimize potential impacts and create buffer distances between sources of odors and receptors.

D. Impact Discussion

This section describes the impacts of the Specific Plan.

a. Conflict with or obstruct implementation of the applicable air quality plan. ***(SU)***

i. Applicable Clean Air Plan Projections

The BAAQMD is the regional agency responsible for overseeing compliance with State and Federal laws, regulations, and programs within the San Francisco Bay Area Air Basin. The BAAQMD, with assistance from the Association of Bay Area Governments and the Metropolitan Transportation Commission, has prepared and implements specific plans to meet the applicable

laws, regulations, and programs. Among them are the 2001 *Ozone Attainment Plan* and the *Bay Area 2010 Clean Air Plan*.[7,8] The BAAQMD has also developed CEQA guidelines to assist lead agencies in evaluating the significance of air quality impacts. In formulating compliance strategies, BAAQMD relies on planned land uses established by local general plans. Land use planning affects vehicle travel, which in turn affects regionwide emissions of air pollutants and GHG.

The Specific Plan would result in approximately an additional 2,766 residents and approximately 4,850 additional employees by the 2035 Plan Horizon. However, this degree of growth was anticipated by the Association of Bay Area Governments (ABAG) and is within 1 percent of the growth used in their planning projections. This is described in detail in Table 4.12-2 in Section 4.12 Population and Housing, and the impacts have been addressed in the individual chapters in this EIR.

Estimates of daily vehicle miles traveled (VMT), and the number of residents and jobs (which added together comprise the service population) in the Plan Area in 2005 were provided by Hexagon Transportation Consultants and are presented in Table 4.3-4. Using 2005 as a baseline year, VMT attributable to the Specific Plan is anticipated to increase 300 percent. The increase in service population would be 192 percent. As a result, VMT would increase at a higher rate than population or service population growth.

In addition, Section 4.14, Traffic and Transportation, provides trip generation estimates for the Specific Plan. However, these projections do not include existing trip generation estimates; therefore, the rate of increase in vehicle trips cannot be compared with existing conditions. Given that only 19 percent of the new trips generated by the Plan would result from residential uses, vehicle trips or VMT are likely to increase at a greater rate than Specific Plan residential population growth.

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[7] BAAQMD, 2001. *Revised San Francisco Bay Area Ozone Attainment Plan for the 1-Hour National Ozone Standard.* Adopted October 24, 2001.

[8] BAAQMD, 2010. *Bay Area 2010 Clean Air Plan.* September.

TABLE 4.3-4 ***VEHICLE MILES TRAVELLED (VMT) AND SERVICE POPULATION IN THE SPECIFIC PLAN AREA***

Metric/ Variable	2005 Conditions	2035 Conditions without Specific Plan	2035 Conditions with Specific Plan Implementation	Incremental Change Due to Specific Plan Implementation
VMT	99,089	153,069	449,922	296,853 (300%)
Population (service)	4,549	--	--	8,739 (192%)

Note: VMT are for trips related to the Specific Plan only.

The Specific Plan includes numerous measures to reduce the rate of vehicle trips or VMT associated with implementation of the Plan land uses. These include:

- **Mixed Uses.** A Mixed Use land use designation is proposed to be applied to properties at the intersection of University Avenue and Bay Road, as well as other properties that front onto Bay Road. This designation provides for multi-story vertical mixed-use development, although horizontal mixed use may also be appropriate at certain locations. In this designation, active uses such as retail are required on the ground floor, with residential units on upper floors. To a more limited extent, upper-floor office uses are permitted above retail. Ground-floor offices and community facilities may also be appropriate in certain circumstances. In all cases, this designation is intended to provide for new development that will contribute to an active and pedestrian-oriented Bay Road.
- **Transportation Demand Management (TDM) Program. Specific Plan Policy TRA-3.1** requires large employers in the Plan Area to participate in a TDM program, which will focus on vehicle trip reductions through encouraging use of transit, carpooling, and shuttles as well as bicycling and walking.

- **Dumbarton Rail Station.** The Specific Plan Area is adjacent to the proposed Dumbarton Rail Line. Station locations are currently being planned as part of a separate project. Rapid Bus/BRT Service may be implemented along University Avenue. The planned transit services would encourage trips to and from the Ravenswood/4 Corners Area to utilize alternative modes of travel, thereby reducing the vehicle trips generated by the project.
- **Pedestrian Improvements.** The City includes a cohesive system of pedestrian/bicycle connections and trails linking activity nodes, employment, housing, parks, and open spaces together. Both new connections and improvements to existing connections are included in the Specific Plan, such as the Rail Spur Pedestrian/Bicycle Connection, the Loop Road/Bay Trail Connection and the Purdue Avenue Pedestrian Connection.

ii. Consistency with Applicable Clean Air Plan Control Measures

Consistency of the Specific Plan with Clean Air Plan control measures is demonstrated by assessing whether the proposed Plan implements all of the applicable Clean Air Plan control measures. The 2010 Clean Air Plan includes about 55 control measures that are intended to reduce air pollutant emissions in the Bay Area either directly or indirectly. The control measures are divided into five categories that include:

- Eighteen measures to reduce stationary and area sources
- Ten mobile source measures
- Seventeen transportation control measures
- Six land use and local impact measures
- Four energy and climate measures.

In developing the control strategy, BAAQMD identified the full range of tools and resources available, both regulatory and non-regulatory, to develop each measure. Implementation of each control measure will rely on some combination of the following:

- Adoption and enforcement of rules to reduce emissions from stationary sources, area sources, and indirect sources.

- Revisions to the BAAQMD's permitting requirements for stationary sources.
- Enforcement of CARB rules to reduce emissions from heavy-duty diesel engines.
- Allocation of grants and other funding by the Air District and/or partner agencies.
- Promotion of best policies and practices that can be implemented by local agencies through guidance documents, model ordinances, and other measures.
- Partnerships with local governments, other public agencies, the business community, non-profits, and other groups.
- Public outreach and education.
- Enhanced air quality monitoring.
- Development of land use guidance and CEQA guidelines, and Air District review and comment on Bay Area projects pursuant to CEQA.
- Leadership and advocacy.

This approach relies upon lead agencies to assist in implementing some of the control measures. A key tool for local agency implementation is the development of land use policies and implementing measures that address new development or redevelopment in local communities. The consistency of the Specific Plan is evaluated with respect to each set of control measures.

a) Stationary and Area Source Control Measures

The Clean Air Plan includes Stationary Source Control measures that BAAQMD adopts as rules or regulations through their authority to control emissions from stationary and area sources. The BAAQMD is the implementing agency, since these control measures are applicable to sources of air pollution that must obtain District permits. The City uses BAAQMD's

CEQA Air Quality Guidelines to evaluate air pollutant emissions from new sources.

b) Mobile Source Measures

The Clean Air Plan includes Mobile Source Measures that would reduce emissions by accelerating the replacement of older, dirtier vehicles and equipment through programs such as the BAAQMD's Vehicle Buy-Back and Smoking Vehicle Programs, and promoting advanced technology vehicles that reduce emissions. The implementation of these measures rely heavily upon incentive programs, such as the Carl Moyer Program and the Transportation Fund for Clean Air, to achieve voluntary emission reductions in advance of, or in addition to, CARB requirements. CARB has new regulations that require the replacement or retrofit of on-road trucks, construction equipment, and other specific equipment that is diesel powered.

c) Transportation Control Measures (TCMs)

The Clean Air Plan includes transportation control measures (TCMs) that are strategies meant to reduce vehicle trips, vehicle use, vehicle miles traveled, vehicle idling, or traffic congestion for the purpose of reducing motor vehicle emissions. While most of the TCMs are implemented at the regional level (that is, by MTC or Caltrans), there are measures that the Clean Air Plan relies upon local communities to assist with implementation. In addition, the Clean Air Plan includes land use measures and energy and climate measures whose implementation is aided by proper land use planning decisions.

The Specific Plan would be consistent with Clean Air Plan measures intended to reduce automobile use, as the Plan is intended to facilitate non-auto linkages through a network of off-street pedestrian and bicycle facilities, an improved sidewalk network, and connections to existing and planned public transportation. In addition to the Specific Plan features or policies that would assist in implementing Clean Air Plan measures, the City's Climate Action Plan, adopted on September 20, 2011, specified numerous actions to address

climate change.[9] These actions and policies would support many of the Clean Air Plan measures aimed at reducing air pollutant and GHG emissions associated with land use planning. The following Clean Air Plan policies are relevant to the Specific Plan:

- Clean Air Plan TCM B-4 – Goods Movement: This is primarily a regional measure; however, **Specific Plan Policy TRA-2.3** would establish truck routes on primary arterials, protecting residential neighborhoods from truck traffic.
- Clean Air Plan TCM C-1 – Support Voluntary Employer Based Trip Reduction Program: The Specific Plan includes measures that would mandate that employers implement a TDM program, which includes a variety of policies, such as subsidizing transit passes, that would encourage transit ridership. The extent of TDM measures that may be implemented is uncertain at this time. Thus, in order to be conservative, no trip reductions were assumed for increased transit usage or the effect of possible TDM measures.
- Clean Air Plan TCM C-2 – Safe Routes to School and Safe Routes to Transit: This measure is intended to implement safe pedestrian and bicycle access to schools and transit. This TCM is supported through Specific Plan features that would enhance sidewalks, expand bicycle routes and trails, and include land use and circulation patterns that make walking and bicycling safer and more efficient.
- Clean Air Plan TCM C-3 – Promote Rideshare Services and Incentives: As discussed under TCM C-1, the Specific Plan would include a TDM program. The program would support regional ride sharing through incentives.
- Clean Air Plan TCM C-4 – Conduct Public Outreach: While this is mostly a regionally implemented TCM, the Specific Plan TDM program would support this TCM.

[9] City of East Palo Alto, September 20, 2011. Staff Report Item No. 29, Climate Action Plan and Initial Study and Negative Declaration.

- Clean Air Plan TCM C-5 – Promote Smart Driving/Speed Moderation: While this measure is aimed at educating the public about the air quality benefits of high speed driving, the Specific Plan supports this measure through the design or redesign of streets and landscaping that would calm traffic. The design of streets with reduced speeds is intended to calm traffic speeds, reducing the high emissions caused by rapid accelerations.
- Clean Air Plan TCM D-1 – Improve Bicycle Access and Facilities: The Specific Plan TDM program would include measures to support this policy, such as encouraging larger businesses to include locker and shower facilities. The Specific Plan area includes a cohesive system of pedestrian/bicycle connections and trails linking activity nodes, employment, housing, parks, and open spaces together. Both new connections and improvements to existing connections are included in the Specific Plan. Specifically, these include the Rail Spur Pedestrian/Bicycle Connection (a multi-use pedestrian trail connection on unused railroad right-of-way), the Loop Road/Bay Trail Connection(a multi-use pedestrian trail connection along the northern portion of the proposed loop road that would connect eastward to the Bay Trail), and the Purdue Avenue Pedestrian Connection (a new pedestrian/bicycle trail alongside Purdue Avenue extending west to University Avenue next to the Costaño Elementary School property and east to the Bay Trail).
- Clean Air Plan TCM D-2 – Improve Pedestrian Access and Facilities: The Specific Plan would include features to improve pedestrian access between residential and commercial areas and between office and commercial areas. The land use plan is intended to increase the walkability of commercial and office land uses within the Plan Area. The Specific Plan TDM program would encourage pedestrian use. As described above (see TCM D-1), the Specific Plan area includes a cohesive system of pedestrian/bicycle connections and trails linking activity nodes, employment, housing, parks, and open spaces together. Both new connections and improvements to existing connections are included in the Specific Plan.
- Clean Air Plan TCM D-3 – Support Local Land Use Strategies: The Specific Plan would develop a community that includes a mix of established

lower-density neighborhoods and new higher-density mixed-use neighborhoods with access to transit. The Specific Plan would support the development of the transit along the Dumbarton Rail Corridor that would provide additional regional transit opportunities.

- Clean Air Plan TCM E-2 – Parking Pricing and Management Strategies: The Specific Plan includes allowances for reduced minimum vehicle parking requirements, based on implementation of measures such as shared parking. The Specific Plan TDM program would support parking strategies that encourage alternatives to single-occupant vehicle trips.
- Clean Air Plan LUM 1 – Goods Movement: The Specific Plan identifies a new loop road that may carry some truck traffic, which could increase the exposure of new sensitive receptors to emissions from goods movements (truck and train emissions). However, exposure of sensitive receptors to existing and future TAC emissions is addressed in this EIR.
- Clean Air Plan LUM 3 – Enhanced CEQA Program: While this TCM addresses BAAQMD actions, the City requires appropriate air quality evaluation of projects during CEQA review using the BAAQMD CEQA Air Quality Guidelines.
- Clean Air Plan LUM 5 – Reduce Risk in Impacted Communities: This issue is addressed in this EIR, in which the impact of existing or new TAC sources upon sensitive receptors is evaluated and mitigation measures to reduce any substantial TAC exposures are identified.
- Clean Air Plan ECM 1– Energy Efficiency: Consistency of this measure is addressed in the Climate Change section. The City would ensure that new projects or redevelopment projects meet the latest energy efficiency standards required by the State. In addition, the City adopted a Climate Action Plan that includes goals to reduce energy use in buildings.
- Clean Air Plan ECM 2 – Renewable Energy: The City's Climate Action Plan includes city-wide policies for increasing renewable energy.
- Clean Air Plan ECM 3 – Mitigation: The planting of vegetation would mitigate urban heat island effects. The Specific Plan would ensure that new projects or redevelopment projects provide an adequate amount of

open space and create public green space and parks in the Plan Area. The City's Climate Action Plan includes a goal to increase urban green space.

- Clean Air Plan ECM 4 – Tree-Planting: As discussed under ECM 3, the Specific Plan and the City's Climate Action Plan would support efforts to plant trees in the Plan Area.

One of the key principles of these regional planning goals is to increase the amount of housing in urbanized parts of the Bay Area, in order to accommodate the region's residential demand. The Specific Plan would provide moderate- to high-density housing in an urbanized part of the Bay Area. This Plan, along with the existing General Plan, would include features, policies, and implementing measures that are consistent with the Climate Action Plan and the Clean Air Plan control measures. However, the potential for increased vehicle use with respect to population growth under the Specific Plan buildout would be a ***significant*** impact.

Impact AQ-1: Conflict with Clean Air Plan Projections and Control Measures. The proposed Plan would increase the rate of vehicle use at a greater rate than population growth. This would lead to greater regional emissions of nonattainment air pollutants (or their precursors) than assumed in the latest Air Quality Plan. ***(SU)***

Mitigation Measure AQ-1: There are no measures available to mitigate this impact related to inconsistency with the Clean Air Plan.

Significance After Mitigation: As there are no available mitigation measures, the impact would remain ***significant and unavoidable.***

b. Violate any air quality standard or contribute substantially to an existing or projected air quality violation. ***(LTS)***

Monitoring data from all ambient air quality monitoring stations in the Bay Area indicate that existing carbon monoxide levels are currently below national and California ambient air quality standards. Monitored CO levels have decreased substantially since 1990 as newer vehicles with greatly im-

proved exhaust emission control systems have replaced older vehicles. The Bay Area has been designated as an attainment area for the CO standards. The highest measured levels in Redwood City (the closest monitoring stations to the Plan Area) during the past three years are 5.5 ppm for 1-hour averaging periods and 2.3 ppm for 8-hour averaging periods.

Even though current CO levels in the Bay Area are well below ambient air quality standards, and there have been no exceedances of CO standards in the Bay Area since 1991, elevated levels of CO still warrant analysis. CO hot-spots (occurrences of localized high CO concentrations) could still occur near busy congested intersections. Recognizing the relatively low CO concentrations experienced in the Bay Area, the BAAQMD's CEQA Air Quality Guidelines state that a project would have a less-than-significant impact if it would not increase traffic volumes at affected intersections to more than 44,000 vehicles per hour. The busiest intersections affected by traffic increases from the Plan would be along University Avenue, which would have total peak hour traffic volumes of less than 20,000 vehicles. Since intersections affected by the project would have volumes less than the threshold of 44,000 vehicles per hour, the impact of the project related to localized CO concentrations would therefore be ***less than significant.***

c. Result in a cumulatively considerable net increase of any criteria pollutant. ***(NI)***

Potential changes to regional emissions of criteria air pollutants are evaluated based on the rate of vehicle travel (trips or vehicle miles traveled) compared to population growth (see Impact AQ-1) . The BAAQMD CEQA Air Quality Guidelines only require emissions computations for project-level analysis. There would therefore be ***no impact***.

d. Expose sensitive receptors to substantial pollutant concentrations. ***(LTS with Mitigation)***

According to the BAAQMD CEQA Air Quality Guidelines, for a plan to have a less-than-significant impact with respect to TACs, buffer zones must be established around existing and proposed land uses that would emit these

air pollutants. Buffer zones to avoid TAC impacts must be reflected in local plan policies, land use maps, or implementing ordinances.

The BAAQMD CEQA Air Quality Guidelines consider exposure of sensitive receptors to air pollutant levels that result in an unacceptable cancer risk or hazard, to be significant. For cancer risk, which is a concern with diesel particulate matter and other mobile-source TACs, the BAAQMD considers an increased risk of contracting cancer that is 10 in one million chances or greater, to be significant risk for a single source. The BAAQMD CEQA Guidelines also consider exposure to annual $PM_{2.5}$ concentrations that exceed 0.3 micrograms per cubic meter (μg/m3) to be significant. Non-cancer risk would be considered significant if the computed Hazard Index is greater than 1.0.[10]

The Specific Plan would permit and facilitate the development of new sensitive receptors, such as new homes, in locations near arterial roadways. Screening levels indicate that sensitive receptors within the Plan Area would be exposed to levels of TACs and or $PM_{2.5}$ that could cause an unacceptable cancer risk or hazard near University Avenue.

To assist the City of East Palo Alto, BAAQMD conducted a preliminary draft analysis based on the methodology outlined in the 2010 CEQA Guidelines, using the most recent screening and analysis tools for risk and hazards.[11]

BAAQMD first mapped the boundaries of the Plan Area in Google Earth, using a .kmz file provided by ABAG planners, and then mapped a 1,000 foot radius from the edge of the Plan Area boundaries. All TAC sources were identified within the Plan Area boundary, as well as within the 1,000 foot boundary. These sources include: stationary sources permitted by BAAQMD; roadways with more than 10,000 annual average daily traffic

[10] The Hazard Index is the ratio of the computed receptor exposure level to the level known to cause acute or chronic adverse health impacts, as identified by BAAQMD.

[11] This is included in the Draft EIR as Appendix 2.

(AADT); and highways or freeways. Then, using the screening analysis tools—the stationary source screening analysis tool, the highway screening analysis tool, and the roadway screening analysis tool – BAAQMD assessed the potential risk and hazard impacts of all the sources, both individually and cumulatively.

According to this preliminary screening analysis, the PM and cancer risk impacts are below the thresholds of significance for all the stationary sources and roadways (with less than 10,000 AADT) within the Plan Area boundaries as well as the 1,000-foot boundary. University Avenue is a State highway that was evaluated using the highway screening analysis tool. The $PM_{2.5}$ and cancer risk impacts are below the thresholds of significance at a 25 foot distance. In addition, the highway screening analysis tool provides estimated risk and hazard impacts at elevations of 6 feet and 20 feet above ground level, representing the placement of sensitive receptors on the first floor versus the second floor and higher. The highway screening analysis tool shows that the estimated PM and cancer risk impacts are below the thresholds of significance for University Avenue at a 10 foot distance if sensitive receptors are placed on the second floor or higher. Typical setbacks along University Avenue are 25 feet or greater, so significant exposures of TACs emitted from University Avenue traffic are not anticipated under existing conditions.

The preliminary screening analysis conducted by BAAQMD evaluated existing sources, using current traffic levels. The increase in traffic levels along local roadways is not expected to change the BAAQMD's preliminary findings of less than significant for TAC exposures. However, as described in Section 4.14, Traffic and Transportation, the Specific Plan could result in large increases in traffic along University Avenue. Under Existing Plus Project conditions, traffic levels are predicted to increase by about 20 percent. The TDM measures outlined in the Plan would reduce this to some extent. In addition, through the Plan Horizon, emissions rates are anticipated to decrease by about 73 percent due to changes in diesel PM_{10} exhaust emission

rates for -heavy-duty diesel trucks, so traffic increases under the proposed plan would not increase TAC exposure.[12]

Under cumulative conditions, that take into account all other planned and reasonably foreseeable projects that could have occurred by 2035, traffic increases may be on the order of 150 percent. Considering the increase in traffic along with the decrease in diesel particulate matter emission rates, significant TAC exposures along University Avenue could extend out to 60 feet from near traffic lanes at ground level and less at second stories and above. The significant TAC exposures identified are based on potential excess cancer risk of greater than 10 cases per million. $PM_{2.5}$ levels would be less than significant at 25 feet or closer to the roadway. The potential for increased excess cancer risk greater than 10 in one million would be a ***significant*** impact**.**

It should be noted that the screening tools include county-specific modeling data. Although this reflects the best available data at this time, the modeling is intentionally conservative, such that if a project passes the initial screen, no additional review related to the impacts is necessary. A more advanced screening analysis could be conducted for developments along University Avenue or close to other sources, and this could decrease the necessary setback distance.

There is also a potential for new emissions sources to enter the area. Typically, these sources would be evaluated through the BAAQMD permit process or the CEQA process to identify and mitigate any significant exposures. However, some sources that would not undergo such a review, such as truck loading docks or truck parking areas, may have the potential to cause significant increases in TAC exposure levels could be a ***significant*** impact.

[12] The rate of change in TAC emissions was computed based on the change in diesel PM_{10} exhaust emission rates for heavy-duty diesel trucks between 2010 and 2030, as computed using EMFAC2007. Much of the TAC exposure along roadways is from heavy-duty diesel trucks.

Impact AQ-2: The proposed Plan could locate sensitive receptors within 60 feet of University Avenue, which may expose sensitive receptors to unhealthy levels of TACs and $PM_{2.5}$ emitted by traffic. In addition, future development could generate new sources of TACs in the Plan Area, which could locate near existing or new sensitive receptors. ***(LTS with Mitigation)***

Mitigation Measure AQ-2: The following measures shall be utilized in site planning and building designs to reduce TAC and $PM_{2.5}$ exposure where new receptors are located within 60 feet of University Avenue:

- Future development under the Plan that includes sensitive receptors (such as schools, hospitals, daycare centers, or retirement homes) located within 60 feet of University Avenue shall require site-specific analysis to determine the level of TAC and $PM_{2.5}$ exposure. This analysis shall be conducted following procedures outlined by BAAQMD. If the site-specific analysis reveals significant exposures, such as cancer risk greater than 10 in one million, additional measures shall be employed to reduce the risk to below the threshold. If this is not possible, the sensitive receptors shall be relocated.
- For significant cancer risk exposure, as defined by BAAQMD, indoor air filtration systems shall be installed to effectively reduce particulate levels to a less-than-significant level. Project sponsors shall submit performance specifications and design details to demonstrate that lifetime residential exposures would result in less-than-significant cancer risks (less than 10 in one million chances).
- Tiered plantings of trees or shrubs along project boundaries closest to University Avenue shall be provided. Tiered plantings may include layering of trees or shrubs between the roadway and buildings within medians, setbacks, or within open spaces associated with buildings.

Significance After Mitigation: Implementation of the appropriate measures listed above would result in TAC exposures that would be below the BAAQMD thresholds, and the impact would be ***less than significant.***

e. Create objectionable odors. ***(LTS with Mitigation)***

Odors are assessed based on the potential of the Plan to result in odor complaints. This could result from the Plan creating development that produces objectionable odors or places people near sources of objectionable odors.

Significant odor sources are not currently located within the Plan Area; therefore, new uses are not likely to be affected by existing odor sources. The Plan Area would include a mix of uses that could place new residences near localized sources of odors. An example would be a mixed-use building that includes both residences and restaurants. While this mix of uses is common in urban areas, odor complaints can occur. Some people find odors from restaurants objectionable, while others find them pleasant. This is considered to be a ***significant*** impact.

Impact AQ-3: New restaurants in mixed-use projects in the Plan Area could be a source of odors that result in complaints from new or existing residences. ***(LTS with Mitigation)***

> Mitigation Measure AQ-3: New restaurants located in mixed-use developments, or adjacent to residential developments, shall install kitchen exhaust vents with filtration systems, re-route vents away from residential development, or use other accepted methods of odor control, in accordance with local building and fire codes.
>
> Significance After Mitigation: With adequate odor controls and operational features in place, objectionable odors should not be generated by new restaurant uses, and the impact would be reduced to a ***less-than-significant*** level.

E. Cumulative Impacts

With respect to regional air pollution, the development of the Plan Area would result in potentially greater vehicle trip growth than population growth, there would be a significant cumulative impact. Localized emissions

from cumulative traffic conditions were not found to cause or contribute to a violation of an ambient air quality standard. Traffic along University Avenue is the only source of TACs with emissions that could adversely affect new sensitive receptors such as residences. The analysis of this impact considered cumulative increases in traffic and found significant exposures could occur out to distances of 60 feet from the travel lanes. There are no other sources to consider in a cumulative analysis. As a result, the Plan would have a ***significant cumulative*** impact.

Impact AQ-CUM-1: Conflict with Clean Air Plan Projections and Control Measures. The proposed Plan would contribute to a regional impact by increasing the rate of vehicle use at a greater rate than population growth. This would lead to greater regional emissions of nonattainment air pollutants (or their precursors) than assumed in the latest Air Quality Plan. ***(SU)***

Mitigation Measure AQ-1: There are no measures available to mitigate this impact related to inconsistency with the Clean Air Plan.

Significance After Mitigation: As there are no available mitigation measures, the impact would remain ***significant and unavoidable.***