Air Quality Technical Report
for the
West Oaks Project
City of Carlsbad, California

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ACRONYMS AND ABBREVIATIONS

Acronym/Abbreviation	Definition
AB	Assembly Bill
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CARB	California Air Resources Board
CalEEMod	California Emissions Estimator Model
CEQA	California Environmental Quality Act
CO	carbon monoxide
DPM	diesel particulate matter
EPA	U.S. Environmental Protection Agency
g/L	grams per liter
HAP	hazardous air pollutant
kWh	kilowatt-hour
LOS	level of service
NAAQS	National Ambient Air Quality Standards
NO	nitric oxide
NO_2	nitrogen dioxide
NO_x	oxides of nitrogen
O_3	ozone
$PM_{2.5}$	fine particulate matter
PM_{10}	coarse particulate matter
RAQS	Regional Air Quality Strategy
SANDAG	San Diego Association of Governments
SDAB	San Diego Air Basin
SDAPCD	San Diego Air Pollution Control District
SDG&E	San Diego Gas & Electric Company
SIP	state implementation plan
SO_2	sulfur dioxide
SO_x	sulfur oxides
TAC	toxic air contaminant
VOC	volatile organic compound

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EXECUTIVE SUMMARY

The purpose of this technical report is to assess the potential air quality impacts associated with implementation of the West Oaks Project (Project). This assessment uses the significance thresholds in Appendix G of the California Environmental Quality Act Guidelines.

Project Overview

The Project is a multi-family residential development proposed along Palomar Airport Road in the City of Carlsbad, California. The Project consists of 192 units composed of one-bedroom one-bathroom, two-bedroom two-bathroom, and three-bedroom three-bathroom units. The Project also includes on-site parking, a recreation/leasing building, and a community pool. The Project would consist of 150 market rate units and 42 affordable units.

Air Quality

The air quality impact analysis evaluated the potential for adverse impacts to air quality due to construction and operational emissions resulting from the Project. Impacts were evaluated for their significance based on the San Diego Air Pollution Control District (SDAPCD) mass daily criteria air pollutant thresholds of significance. Criteria air pollutants are defined as pollutants for which the federal and state governments have established ambient air quality standards (criteria) for outdoor concentrations to protect public health. Criteria air pollutants include ozone (O_3), nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), particulate matter with an aerodynamic diameter less than or equal to 10 microns (PM_{10}), particulate matter with an aerodynamic diameter less than or equal to 2.5 microns ($PM_{2.5}$), and lead. Pollutants that are evaluated include volatile organic compounds (VOCs) (also referred to as reactive organic gases), oxides of nitrogen (NO_x), CO, sulfur oxides (SO_x), PM_{10}, and $PM_{2.5}$. VOCs and NO_x are important because they are precursors to O_3.

Air Quality Plan Consistency

If a project proposes development that is greater than that anticipated in the local plan and the growth projections set by the San Diego Association of Governments (SANDAG), the project might be in conflict with the State Implementation Plan and Regional Air Quality Strategy, and therefore may contribute to a potentially significant cumulative impact on air quality. The Project was deemed to be consistent with the current air quality plan, because the anticipated growth associated with the Project does not exceed that projected by SANDAG. In addition, the Project would not result in an increase in the frequency or severity of existing air quality violations or cause or contribute to new violations. Based on these considerations, impacts related to the Project's potential to conflict with or obstruct implementation of the applicable air quality plan would be less than significant.

Construction Criteria Air Pollutant Emissions

Construction of the Project would result in the temporary addition of pollutants to the local airshed caused by on-site sources (i.e., off-road construction equipment, soil disturbance, and VOC off-gassing) and off-site sources (i.e., on-road haul trucks, vendor trucks, and worker vehicle trips). Maximum daily construction emissions would not exceed the SDAPCD significance thresholds for VOCs, NO_x, CO, SO_x, PM_{10}, or $PM_{2.5}$ during construction. Therefore, the Project would have a less than significant impact.

Operational Criteria Air Pollutant Emissions

~~Consistent with the Local Mobility Analysis for the Project prepared for the Project (Linscott, Law & Greenspan 2020), t~~The analysis herein assumed an operational year of 2022. Operation of the Project would generate operational criteria air pollutants from mobile sources (vehicles), area sources (consumer product use, architectural coatings, and landscape maintenance equipment), and energy (natural gas). Maximum operational emissions would not exceed the SDAPCD operational significance thresholds for VOCs, $NO_{x,}$ CO, SO_x, PM_{10}, or $PM_{2.5}$.

Cumulative Impacts

The potential for a project to result in a cumulatively considerable impact, per the SDAPCD guidance and thresholds, is based on the project's potential to exceed the project-specific daily thresholds. Because maximum construction and operational emissions would not exceed the SDAPCD significance thresholds for VOCs, NO_x, CO, SO_x, PM_{10}, or $PM_{2.5}$, the Project would not result in a cumulatively considerable increase in criteria air pollutants.

Exposure of Sensitive Receptors

Construction activities would not generate emissions in excess of the SDAPCD site-specific mass daily thresholds; therefore, site-specific construction impacts during construction of the Project would be less than significant. In addition, diesel equipment would also be subject to the California Air Resources Board Airborne Toxic Control Measures for in-use off-road diesel fleets, which would minimize diesel particulate matter emissions. No residual toxic air contaminant emissions and corresponding cancer risk are anticipated after construction, since no long-term sources of toxic air contaminant emissions are anticipated during operation of the Project. Therefore, impacts to sensitive receptors would be less than significant.

The CO hotspot analysis prepared for the Project showed that the intersections that operated at a level of service (LOS) E or worse would not exceed the 1-hour or 8-hour ambient air quality standards. As such, potential Project-generated impacts associated with CO hotspots would be less than significant.

Other Emissions

Potential odors produced during construction would be attributable to concentrations of unburned hydrocarbons from tailpipes of construction equipment, architectural coatings, and asphalt pavement application, which would disperse rapidly from the Project site and generally occur at magnitudes that would not affect substantial numbers of people. Impacts associated with odors during construction would be less than significant. The Project would be a residential development that would not include land uses with sources that have the potential to generate substantial odors, and impacts associated with odors during operation would be less than significant.

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1 INTRODUCTION

1.1 Report Purpose and Scope

The purpose of this report is to estimate and evaluate the potential air quality impacts associated with implementation of the West Oaks Project (Project) relative to the San Diego Air Pollution Control District (SDAPCD) Rule 20.2 for New Source Review (SDAPCD 2016a) and for compliance with applicable state and federal rules and regulations. This assessment also uses the significance thresholds in Appendix G of the California Environmental Quality Act (CEQA) Guidelines (14 CCR 15000 et seq.).

This introductory chapter provides a description of the Project and the Project location. Chapter 2 describes existing air-quality-related conditions and Chapter 3 provides a background on criteria and non-criteria air pollutants and effects. A summary of the regulatory setting is provided in Chapter 4, and regional and local air quality conditions are described in Chapter 5. Chapter 6 presents the thresholds of significance applied in the impact analysis contained in Chapter 7. Lastly, Chapter 8 includes a list of the references cited.

1.2 Project Location

The approximate 12.73-acre Project site (including West Oaks Way) is located within the City of Carlsbad (City), California, San Diego County, California. The site is located roughly 2.1 miles east of the Pacific Ocean and is within the Coastal Zone Boundary (Figure 1, Regional Map). Specifically, the site is located approximately 0.5 miles east of Aviara Parkway, directly west of Palomar Oaks Way, and immediately south of Palomar Airport Road. The approximate centroid of the Project site is at longitude 117.2925° west and latitude 33.1210° north within Section 22, Township 12 south, Range 4 west on the U.S. Geological Survey 7.5-minute Encinitas Quadrangle map (Figure 2, Vicinity Map). According to the San Diego Basin Plan, the Project site is located within the Carlsbad Watershed Encinas Hydrologic Area (904.4) within the Canyon de las Encinas Basin (4.40) (RWQCB 2015). The Project site is located on Assessor's Parcel Numbers 212-110-01 through 212-110-07 and 212-040-26.

1.3 Project Description

The Project would develop 192-unit multifamily apartment homes in a three-story walk-up Type VB construction. The residences would consist of 42 affordable units (built on site) and 150 market-rate residences. The Project includes a new driveway entrance and bridge at the western end of West Oaks Way as well as a new internal loop road (Fuscoe Engineering and Summa Architecture 2017). Surface parking would be provided in several areas within the Project site, providing approximately 382 parking spaces. The Project would also include a swimming pool for shared residential use.

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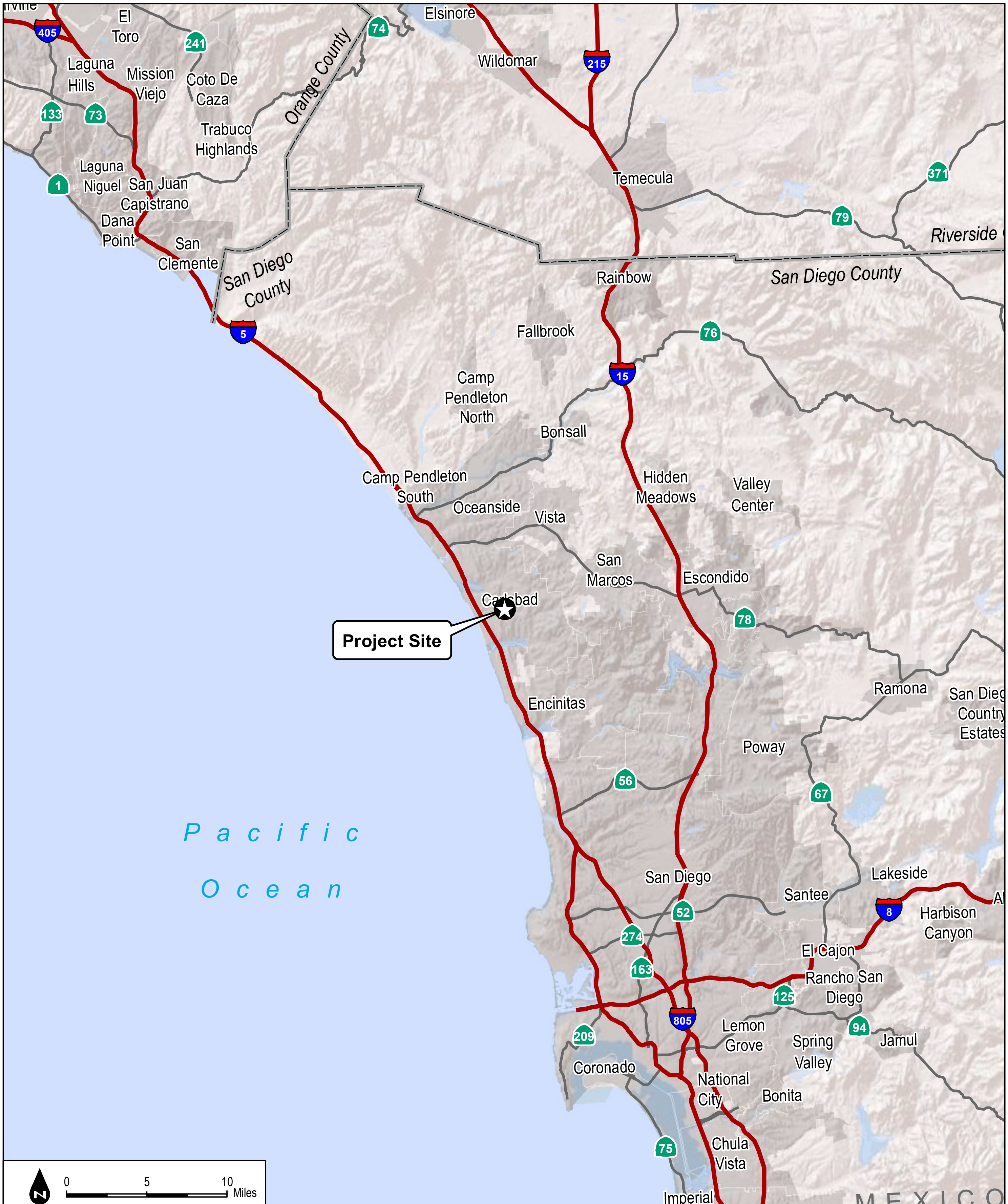

SOURCE: ESRI 2016

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FIGURE 1

Regional Map

Air Quality Technical Report for the West Oaks Project

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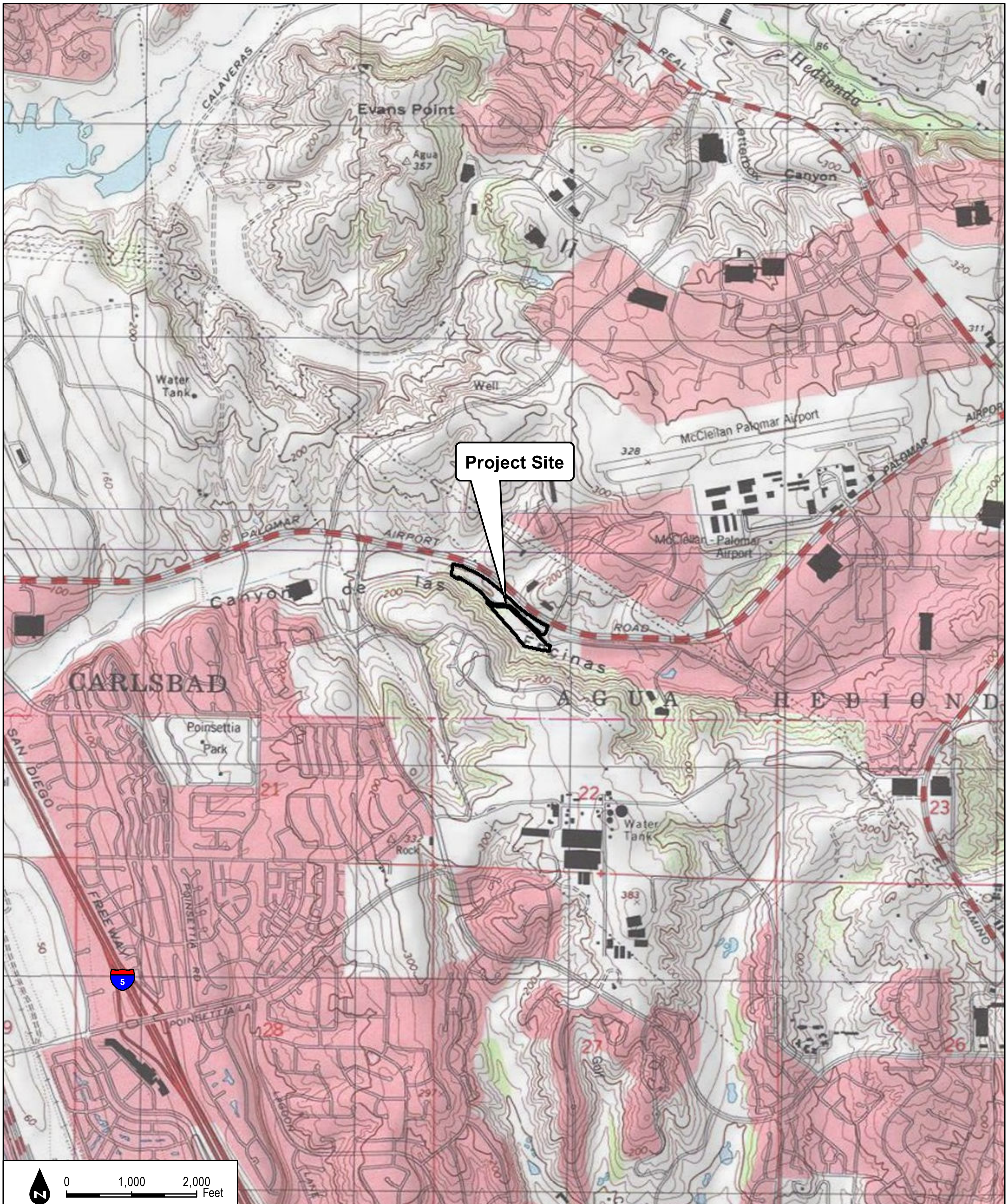

SOURCE: USGS 7.5-Minute Series Encinitas Quadrangle.

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FIGURE 2

Vicinity Map

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2 EXISTING CONDITIONS

2.1 Climate and Topography

The weather of the San Diego region, as in most of Southern California, is influenced by the Pacific Ocean and its semi-permanent high-pressure systems that result in dry, warm summers and mild, occasionally wet winters. The average temperature ranges (in degrees Fahrenheit) from the mid-40s to the high 90s. Most of the region's precipitation falls from November to April, with infrequent (approximately 10%) precipitation during the summer. The average seasonal precipitation along the coast is approximately 10 inches; the amount increases with elevation as moist air is lifted over the mountains (WRCC 2016).

The topography in the San Diego region varies greatly, from beaches on the west to mountains and desert on the east; along with local meteorology, it influences the dispersal and movement of pollutants in the basin. The mountains to the east prohibit dispersal of pollutants in that direction and help trap them in inversion layers.

The interaction of ocean, land, and the Pacific High Pressure Zone maintains clear skies for much of the year and influences the direction of prevailing winds (westerly to northwesterly). Local terrain is often the dominant factor inland, and winds in inland mountainous areas tend to blow through the valleys during the day and down the hills and valleys at night.

2.2 San Diego Air Basin Climatology

The Project area is located within the San Diego Air Basin (SDAB) and is subject to the SDAPCD guidelines and regulations. The SDAB is one of 15 air basins that geographically divide the State of California. The SDAB is currently classified as a federal nonattainment area for ozone (O_3) and a state nonattainment area for particulate matter less than 10 microns (PM_{10}), particulate matter less than 2.5 microns ($PM_{2.5}$), and O_3.

The SDAB, which lies in the southwest corner of California and comprises the entire San Diego region, covers 4,260 square miles and is an area of high air pollution potential. The SDAB experiences warm summers, mild winters, infrequent rainfalls, light winds, and moderate humidity. This usually mild climatological pattern is interrupted infrequently by periods of extremely hot weather, winter storms, or Santa Ana winds.

The SDAB experiences frequent temperature inversions. Subsidence inversions occur during the warmer months as descending air associated with the Pacific High Pressure Zone meets cool marine air. The boundary between the two layers of air creates a temperature inversion that traps pollutants. The other type of inversion, a radiation inversion, develops on winter nights when air near the ground cools by heat radiation and air aloft remains warm. The shallow inversion layer formed between these two air masses also can trap pollutants. As the pollutants become more concentrated in the atmosphere, photochemical reactions occur that produce O_3, which contributes to the formation of smog. Smog is a combination of smoke and other particulates, O_3, hydrocarbons, oxides of nitrogen (NO_x) and other chemically reactive compounds which, under certain conditions of weather and sunlight, may result in a murky brown haze that causes adverse health effects (CARB 2017).

Light daytime winds, predominantly from the west, further aggravate the condition by driving air pollutants inland, toward the mountains. During the fall and winter, air quality problems are created due to carbon monoxide (CO) and NO_x emissions. CO concentrations are generally higher in the morning and late evening. In the morning, CO levels are elevated due to cold temperatures and the large number of motor vehicles traveling. Higher CO levels during the late evenings are a result of stagnant atmospheric conditions trapping CO in the area. Since CO is produced almost entirely from automobiles, the highest CO concentrations in the SDAB are associated with heavy traffic. Nitrogen dioxide (NO_2) levels are also generally higher during fall and winter days.

Under certain conditions, atmospheric oscillation results in the offshore transport of air from the Los Angeles region to San Diego County. This often produces high O_3 concentrations, as measured at air pollutant monitoring stations within San Diego County. The transport of air pollutants from Los Angeles to San Diego has also occurred within the stable layer of the elevated subsidence inversion, where high levels of O_3 are transported.

2.3 Sensitive Receptors

Air quality varies as a direct function of the amount of pollutants emitted into the atmosphere, the size and topography of the air basin, and the prevailing meteorological conditions. Air quality problems arise when the rate of pollutant emissions exceeds the rate of dispersion. Reduced visibility, eye irritation, and adverse health impacts upon those persons termed sensitive receptors are the most serious hazards of existing air quality conditions in the area.

Some land uses are considered more sensitive to changes in air quality than others, depending on the population groups and the activities involved. People most likely to be affected by air pollution include children, the elderly, athletes, and people with cardiovascular and chronic respiratory diseases. Facilities and structures where these air pollution-sensitive people live or spend considerable amounts of time are known as sensitive receptors. Land uses where air pollution-sensitive individuals are most likely to spend time include schools and schoolyards, parks and playgrounds, daycare centers, nursing homes, athletic fields, hospitals, and residential communities (sensitive sites or sensitive land uses) (CARB 2005). The closest sensitive receptor to the Project site would be residences located approximately 410 feet southwest of the site.

3 POLLUTANTS AND EFFECTS

3.1 Criteria Air Pollutants

Criteria air pollutants are defined as pollutants for which the federal and state governments have established ambient air quality standards, or criteria, for outdoor concentrations to protect public health. The federal and state standards have been set, with an adequate margin of safety, at levels above which concentrations could be harmful to human health and welfare. These standards are designed to protect the most sensitive persons from illness or discomfort. Pollutants of concern include O_3, NO_2, CO, sulfur dioxide (SO_2), PM_{10}, $PM_{2.5}$, and lead. These pollutants are discussed in the following paragraphs.[1] In California, sulfates, vinyl chloride, hydrogen sulfide, and visibility-reducing particles are also regulated as criteria air pollutants.

Ozone (O_3). O_3 is a strong-smelling, pale blue, reactive, toxic chemical gas consisting of three oxygen atoms. It is a secondary pollutant formed in the atmosphere by a photochemical process involving the sun's energy and O_3 precursors. These precursors are mainly NO_x and VOCs. The maximum effects of precursor emissions on O_3 concentrations usually occur several hours after they are emitted and many miles from the source. Meteorology and terrain play major roles in O_3 formation, and ideal conditions occur during summer and early autumn on days with low wind speeds or stagnant air, warm temperatures, and cloudless skies. O_3 exists in the upper atmosphere O_3 layer (stratospheric O_3) and at the Earth's surface in the troposphere (O_3).[2] The O_3 that the U.S. Environmental Protection Agency (EPA) and the California Air Resources Board (CARB) regulate as a criteria air pollutant is produced close to the ground level, where people live, exercise, and breathe. Ground-level O_3 is a harmful air pollutant that causes numerous adverse health effects and is thus considered "bad" O_3. Stratospheric, or "good," O_3 occurs naturally in the upper atmosphere, where it reduces the amount of ultraviolet light (i.e., solar radiation) entering the Earth's atmosphere. Without the protection of the beneficial stratospheric O_3 layer, plant and animal life would be seriously harmed.

O_3 in the troposphere causes numerous adverse health effects; short-term exposures (lasting for a few hours) to O_3 at levels typically observed in Southern California can result in breathing pattern changes, reduction of breathing capacity, increased susceptibility to infections, inflammation of the lung tissue, and some immunological changes (EPA 2013). These health problems are particularly acute in sensitive receptors such as the sick, the elderly, and young children.

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1 The following descriptions of health effects for each of the criteria air pollutants associated with project construction and operations are based on the U.S. Environmental Protection Agency's "Six Common Air Pollutants" (EPA 2017a) and the California Air Resources Board's "Glossary of Air Pollutant Terms" (CARB 2017) published information.

2 The troposphere is the layer of the Earth's atmosphere nearest to the surface of the Earth. The troposphere extends outward about 5 miles at the poles and about 10 miles at the equator.

Nitrogen Dioxide (NO_2). NO_2 is a brownish, highly reactive gas that is present in all urban atmospheres. The major mechanism for the formation of NO_2 in the atmosphere is the oxidation of the primary air pollutant nitric oxide (NO), which is a colorless, odorless gas. NO_x plays a major role, together with VOCs, in the atmospheric reactions that produce O_3. NO_x is formed from fuel combustion under high temperature or pressure. In addition, NO_x is an important precursor to acid rain and may affect both terrestrial and aquatic ecosystems. The two major emissions sources are transportation and stationary fuel combustion sources such as electric utility and industrial boilers.

NO_2 can irritate the lungs, cause bronchitis and pneumonia, and lower resistance to respiratory infections (EPA 2016a).

Carbon Monoxide (CO). CO is a colorless, odorless gas formed by the incomplete combustion of hydrocarbon, or fossil fuels. CO is emitted almost exclusively from motor vehicles, power plants, refineries, industrial boilers, ships, aircraft, and trains. In urban areas, such as the Project location, automobile exhaust accounts for the majority of CO emissions. CO is a non-reactive air pollutant that dissipates relatively quickly; therefore, ambient CO concentrations generally follow the spatial and temporal distributions of vehicular traffic. CO concentrations are influenced by local meteorological conditions—primarily wind speed, topography, and atmospheric stability. CO from motor vehicle exhaust can become locally concentrated when surface-based temperature inversions are combined with calm atmospheric conditions, which is a typical situation at dusk in urban areas from November to February. The highest levels of CO typically occur during the colder months of the year, when inversion conditions are more frequent.

In terms of adverse health effects, CO competes with oxygen, often replacing it in the blood, reducing the blood's ability to transport oxygen to vital organs. The results of excess CO exposure can include dizziness, fatigue, and impairment of central nervous system functions.

Sulfur Dioxide (SO_2). SO_2 is a colorless, pungent gas formed primarily from incomplete combustion of sulfur-containing fossil fuels. The main sources of SO_2 are coal and oil used in power plants and industries; as such, the highest levels of SO_2 are generally found near large industrial complexes. In recent years, SO_2 concentrations have been reduced by the increasingly stringent controls placed on stationary source emissions of SO_2 and limits on the sulfur content of fuels.

SO_2 is an irritant gas that attacks the throat and lungs and can cause acute respiratory symptoms and diminished ventilator function in children. When combined with particulate matter, SO_2 can injure lung tissue and reduce visibility and the level of sunlight. SO_2 can also yellow plant leaves and erode iron and steel.

Particulate Matter (PM). Particulate matter pollution consists of very small liquid and solid particles floating in the air, which can include smoke, soot, dust, salts, acids, and metals. Particulate matter can form when gases emitted from industries and motor vehicles undergo chemical reactions in the atmosphere. $PM_{2.5}$ and PM_{10} represent fractions of particulate matter. Coarse particulate matter (PM_{10}) consists of particulate matter that is 10 microns or less in diameter and is about 1/7 the thickness of a human hair. Major sources of PM_{10} include crushing or grinding operations; dust stirred up by vehicles traveling on roads; wood-burning stoves and fireplaces; dust from construction, landfills, and agriculture; wildfires and brush/waste burning; industrial sources; windblown dust from open lands; and atmospheric chemical and photochemical reactions. Fine particulate matter ($PM_{2.5}$) consists of particulate matter that is 2.5 microns or less in diameter and is roughly 1/28 the diameter of a human hair. $PM_{2.5}$ results from fuel combustion (e.g., from motor vehicles and power generation and industrial facilities), residential fireplaces, and woodstoves. In addition, $PM_{2.5}$ can be formed in the atmosphere from gases such as sulfur oxides (SO_x), NO_x, and VOCs.

$PM_{2.5}$ and PM_{10} pose a greater health risk than larger-size particles. When inhaled, these tiny particles can penetrate the human respiratory system's natural defenses and damage the respiratory tract. $PM_{2.5}$ and PM_{10} can increase the number and severity of asthma attacks, cause or aggravate bronchitis and other lung diseases, and reduce the body's ability to fight infections. Very small particles of substances such as lead, sulfates, and nitrates can cause lung damage directly or be absorbed into the blood stream, causing damage elsewhere in the body. Additionally, these substances can transport adsorbed gases such as chlorides or ammonium into the lungs, also causing injury. Whereas PM_{10} tends to collect in the upper portion of the respiratory system, $PM_{2.5}$ is so tiny that it can penetrate deeper into the lungs and damage lung tissue. Suspended particulates also damage and discolor surfaces on which they settle and produce haze and reduce regional visibility.

People with influenza, people with chronic respiratory and cardiovascular diseases, and the elderly may suffer worsening illness and premature death as a result of breathing particulate matter. People with bronchitis can expect aggravated symptoms from breathing in particulate matter. Children may experience a decline in lung function due to breathing in PM_{10} and $PM_{2.5}$ (EPA 2009).

Lead. Lead in the atmosphere occurs as particulate matter. Sources of lead include leaded gasoline; the manufacturing of batteries, paints, ink, ceramics, and ammunition; and secondary lead smelters. Prior to 1978, mobile emissions were the primary source of atmospheric lead. Between 1978 and 1987, the phaseout of leaded gasoline reduced the overall inventory of airborne lead by nearly 95%. With the phaseout of leaded gasoline, secondary lead smelters, battery recycling, and manufacturing facilities are becoming lead-emissions sources of greater concern.

Prolonged exposure to atmospheric lead poses a serious threat to human health. Health effects associated with exposure to lead include gastrointestinal disturbances, anemia, kidney disease, and in severe cases, neuromuscular and neurological dysfunction. Of particular concern are low-level lead exposures during infancy and childhood. Such exposures are associated with decrements in neurobehavioral performance, including IQ performance, psychomotor performance, reaction time, and growth. Children are highly susceptible to the effects of lead.

Volatile Organic Compounds (VOCs). Hydrocarbons are organic gases that are formed from hydrogen and carbon and sometimes other elements. Hydrocarbons that contribute to formation of O_3 are referred to and regulated as VOCs (also referred to as reactive organic gases). Combustion engine exhaust, oil refineries, and fossil-fueled power plants are the sources of hydrocarbons. Other sources of hydrocarbons include evaporation from petroleum fuels, solvents, dry-cleaning solutions, and paint.

The primary health effects of VOCs result from the formation of O_3 and its related health effects. High levels of VOCs in the atmosphere can interfere with oxygen intake by reducing the amount of available oxygen through displacement. Carcinogenic forms of hydrocarbons, such as benzene, are considered toxic air contaminants (TACs). There are no separate health standards for VOCs as a group.

3.2 Non-Criteria Pollutants

Toxic Air Contaminants (TACs). A substance is considered toxic if it has the potential to cause adverse health effects in humans, including increasing the risk of cancer upon exposure, or acute and/or chronic noncancer health effects. A toxic substance released into the air is considered a TAC. TACs are identified by federal and state agencies based on a review of available scientific evidence. In the State of California, TACs are identified through a two-step process that was established in 1983 under the Toxic Air Contaminant Identification and Control Act. This two-step process of risk identification and risk management and reduction was designed to protect residents from the health effects of toxic substances in the air. In addition, the California Air Toxics "Hot Spots" Information and Assessment Act, AB 2588, was enacted by the legislature in 1987 to address public concern over the release of TACs into the atmosphere. The law requires facilities emitting toxic substances to provide local air pollution control districts with information that will allow an assessment of the air toxics problem, identification of air toxics emissions sources, location of resulting hotspots, notification of the public exposed to significant risk, and development of effective strategies to reduce potential risks to the public over 5 years.

Examples include certain aromatic and chlorinated hydrocarbons, certain metals, and asbestos. TACs are generated by a number of sources, including stationary sources such as dry cleaners, gas stations, combustion sources, and laboratories; mobile sources such as automobiles; and area sources such as landfills. Adverse health effects associated with exposure to TACs may include carcinogenic (i.e., cancer-causing) and noncarcinogenic effects. Noncarcinogenic effects typically affect one or more target organ systems and may be experienced on either short-term (acute) or long-term (chronic) exposure to a given TAC.

Diesel Particulate Matter (DPM). DPM is part of a complex mixture that makes up diesel exhaust. Diesel exhaust is composed of two phases, gas and particle, both of which contribute to health risks. More than 90% of DPM is less than 1 micrometer in diameter (about 1/70th the diameter of a human hair), and thus is a subset of $PM_{2.5}$ (CARB 2016a). DPM is typically composed of carbon particles ("soot," also called black carbon) and numerous organic compounds, including over 40 known cancer-causing organic substances. Examples of these chemicals include polycyclic aromatic hydrocarbons, benzene, formaldehyde, acetaldehyde, acrolein, and 1,3-butadiene (CARB 2016a). CARB classified "particulate emissions from diesel-fueled engines" (i.e., DPM) as a TAC in August 1998 (17 CCR 93000). DPM is emitted from a broad range of diesel engines: on-road diesel engines of trucks, buses, and cars and off-road diesel engines including locomotives, marine vessels, and heavy-duty construction equipment, among others. Approximately 70% of all airborne cancer risk in California is associated with DPM (CARB 2000). To reduce the cancer risk associated with DPM, CARB adopted a diesel risk reduction plan in 2000 (CARB 2000). Because it is part of $PM_{2.5}$, DPM also contributes to the same non-cancer health effects as $PM_{2.5}$ exposure. These effects include premature death; hospitalizations and emergency department visits for exacerbated chronic heart and lung disease, including asthma; increased respiratory symptoms; and decreased lung function in children. Several studies suggest that exposure to DPM may also facilitate development of new allergies (CARB 2016a). Those most vulnerable to non-cancer health effects are children whose lungs are still developing and the elderly who often have chronic health problems.

Odorous Compounds. Odors are generally regarded as an annoyance rather than a health hazard. Manifestations of a person's reaction to odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting and headache). The ability to detect odors varies considerably among the population and overall is quite subjective. People may have different reactions to the same odor. An odor that is offensive to one person may be perfectly acceptable to another (e.g., coffee roaster). An unfamiliar odor is more easily detected and is more likely to cause complaints than a familiar one. In a phenomenon known as odor fatigue, a person can become desensitized to almost any odor, and recognition may only occur with an alteration in the intensity. The occurrence and severity of odor impacts depend on the nature, frequency, and intensity of the source; wind speed and direction; and the sensitivity of receptors.

Valley Fever. Coccidioidomycosis, more commonly known as "Valley Fever," is an infection caused by inhalation of the spores of the *Coccidioides immitis* fungus, which grows in the soils of the southwestern United States. The fungus is very prevalent in the soils of California's San Joaquin Valley, particularly in Kern County. Kern County is considered a highly endemic county (i.e., more than 20 cases annually of Valley Fever per 100,000 people) based on the incidence rates reported through 2016 (California Department of Public Health 2017). The ecologic factors that appear to be most conducive to survival and replication of the spores are high summer temperatures, mild winters, sparse rainfall, and alkaline, sandy soils.

San Diego County (the County) is not considered a highly endemic region for Valley Fever, as the latest report from the California Department of Public Health indicated the County has 4.4 cases per 100,000 people (California Department of Public Health 2017). Similarly, among the total reported incidents of Valley Fever from 2008 through 2017, only 0.3 percent of the cases reported in the County were in the City's zip code (92011) (County of San Diego 2018).

4 REGULATORY SETTING

4.1 Federal

4.1.1 Criteria Pollutants

The federal Clean Air Act (CAA), passed in 1970 and last amended in 1990, forms the basis for the national air pollution control effort. The EPA is responsible for implementing most aspects of the CAA, including the setting of National Ambient Air Quality Standards (NAAQS) for major air pollutants, hazardous air pollutant (HAP) standards, approval of state attainment plans, motor vehicle emission standards, stationary source emission standards and permits, acid rain control measures, stratospheric O_3 protection, and enforcement provisions.

NAAQS are established by the EPA for "criteria pollutants" under the CAA, which are O_3, CO, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and lead. The NAAQS describe acceptable air quality conditions designed to protect the health and welfare of the citizens of the nation. The CAA requires the EPA to reassess the NAAQS at least every 5 years to determine whether adopted standards are adequate to protect public health based on current scientific evidence. States with areas that exceed the NAAQS must prepare a state implementation plan (SIP) that demonstrates how those areas will attain the standards within mandated time frames.

4.1.2 Hazardous Air Pollutants

The 1977 CAA Amendments required the EPA to identify national emission standards for hazardous air pollutants to protect the public health and welfare. HAPs include certain volatile organic chemicals, pesticides, herbicides, and radionuclides that present a tangible hazard, based on scientific studies of exposure to humans and other mammals. Under the 1990 CAA Amendments, which expanded the control program for HAPs, 189 substances and chemical families were identified as HAPs.

4.2 State

4.2.1 Criteria Pollutants

The California Clean Air Act was adopted in 1988 and establishes the state's air quality goals, planning mechanisms, regulatory strategies, and standards of progress. Under the California Clean Air Act, the task of air quality management and regulation has been legislatively granted to CARB, with subsidiary responsibilities assigned to air quality management districts and air pollution control districts at the regional and county levels. CARB is responsible for ensuring implementation of the California Clean Air Act, responding to the federal CAA, and regulating emissions from motor vehicles and consumer products. Pursuant to the authority granted to it, CARB has established California Ambient Air Quality Standards (CAAQS), which are generally more restrictive than the NAAQS.

The NAAQS and CAAQS are presented in Table 1.

Table 1
Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[a]	National Standards[b]	
		Concentration[c]	*Primary*[c,d]	*Secondary*[c,e]
O_3	1 hour	0.09 ppm (180 μg/m³)	—	Same as primary standard[f]
	8 hours	0.070 ppm (137 μg/m³)	0.070 ppm (137 μg/m³)[f]	
NO_2[g]	1 hour	0.18 ppm (339 μg/m³)	0.100 ppm (188 μg/m³)	Same as primary standard
	Annual arithmetic mean	0.030 ppm (57 μg/m³)	0.053 ppm (100 μg/m³)	
CO	1 hour	20 ppm (23 mg/m³)	35 ppm (40 mg/m³)	None
	8 hours	9.0 ppm (10 mg/m³)	9 ppm (10 mg/m³)	
SO_2[h]	1 hour	0.25 ppm (655 μg/m³)	0.075 ppm (196 μg/m³)	—
	3 hours	—	—	0.5 ppm (1,300 μg/m³)
	24 hours	0.04 ppm (105 μg/m³)	0.14 ppm (for certain areas)[g]	—
	Annual	—	0.030 ppm (for certain areas)[g]	—
PM_{10}[i]	24 hours	50 μg/m³	150 μg/m³	Same as primary standard
	Annual arithmetic mean	20 μg/m³	—	
$PM_{2.5}$[i]	24 hours	—	35 μg/m³	Same as primary standard
	Annual arithmetic mean	12 μg/m³	12.0 μg/m³	15.0 μg/m³
Lead[j, k]	30-day average	1.5 μg/m³	—	—
	Calendar quarter	—	1.5 μg/m³ (for certain areas)[k]	Same as primary standard
	Rolling 3-month average	—	0.15 μg/m³	
Hydrogen sulfide	1 hour	0.03 ppm (42 μg/m³)	—	—
Vinyl chloride[j]	24 hours	0.01 ppm (26 μg/m³)	—	—
Sulfates	24- hours	25 μg/m³	—	—
Visibility reducing particles	8 hour (10:00 a.m. to 6:00 p.m. PST)	Insufficient amount to produce an extinction coefficient of 0.23 per kilometer due to the number of particles when the relative humidity is less than 70%	—	—

Source: CARB 2016b.

Notes: O_3 = ozone; ppm = parts per million by volume; μg/m^3 = micrograms per cubic meter; NO_2 = nitrogen dioxide; CO = carbon monoxide; mg/m^3= milligrams per cubic meter; SO_2 = sulfur dioxide; PM_{10} = particulate matter with an aerodynamic diameter less than or equal to 10 microns; $PM_{2.5}$ = particulate matter with an aerodynamic diameter less than or equal to 2.5 microns.

[a] California standards for O_3, CO, SO_2 (1-hour and 24-hour), NO_2, suspended particulate matter (PM_{10}, $PM_{2.5}$), and visibility-reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded. CAAQS are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

[b] National standards (other than O_3, NO_2, SO_2, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once per year. The O_3 standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over 3 years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 μg/m^3 is equal to or less than 1. For $PM_{2.5}$, the 24-hour standard is attained when 98% of the daily concentrations, averaged over 3 years, are equal to or less than the standard.

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

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

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

[f] On October 1, 2015, the national 8-hour ozone primary and secondary standards were lowered from 0.075 to 0.070 ppm.

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

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

[i] On December 14, 2012, the national annual $PM_{2.5}$ primary standard was lowered from 15 μg/m^3 to 12.0 μg/m^3. The existing national 24-hour $PM_{2.5}$ standards (primary and secondary) were retained at 35 μg/m^3, as was the annual secondary standard of 15 μg/m^3. The existing 24-hour PM_{10} standards (primary and secondary) of 150 μg/m^3 were also retained. The form of the annual primary and secondary standards is the annual mean averaged over 3 years.

[j] CARB has identified lead and vinyl chloride as TACs with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

[k] The national standard for lead was revised on October 15, 2008, to a rolling 3-month average. The 1978 lead standard (1.5 μg/m^3 as a quarterly average) remains in effect until 1 year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

4.2.2 Toxic Air Contaminants

The state Air Toxics Program was established in 1983 under Assembly Bill (AB) 1807 (Tanner). The California TAC list identifies more than 700 pollutants, of which carcinogenic and noncarcinogenic toxicity criteria have been established for a subset of these pollutants pursuant to the California Health and Safety Code. In accordance with AB 2728, the state list includes the (federal) HAPs. The Air Toxics "Hot Spots" Information and Assessment Act of 1987 (AB 2588) seeks to identify and evaluate risk from air toxics sources; however, AB 2588 does not regulate air toxics emissions. TAC emissions from individual facilities are quantified and prioritized. "High-priority" facilities are required to perform a health risk assessment, and if specific thresholds are exceeded, are required to communicate the results to the public in the form of notices and public meetings.

In 2000, CARB approved a comprehensive Diesel Risk Reduction Plan to reduce diesel emissions from both new and existing diesel-fueled vehicles and engines. The regulation is anticipated to result in an 80% decrease in statewide diesel health risk in 2020 compared with the diesel risk in 2000. Additional regulations apply to new trucks and diesel fuel, including the On-Road Heavy Duty Diesel Vehicle (In-Use) Regulation, the On-Road Heavy Duty (New) Vehicle Program, the In-Use Off-Road Diesel Vehicle Regulation, and the New Off-Road Compression-Ignition (Diesel) Engines and Equipment program. All of these regulations and programs have timetables by which manufacturers must comply and existing operators must upgrade their diesel powered equipment. Several Airborne Toxic Control Measures that reduce diesel emissions including In-Use Off-Road Diesel-Fueled Fleets (13 CCR 2449 et seq.) and In-Use On-Road Diesel-Fueled Vehicles (13 CCR 2025).

California Health and Safety Code Section 41700

This section of the Health and Safety Code states that a person shall not discharge from any source whatsoever quantities of air contaminants or other material that cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or that endanger the comfort, repose, health, or safety of any of those persons or the public, or that cause, or have a natural tendency to cause, injury or damage to business or property. This section also applies to sources of objectionable odors.

4.3 Local

San Diego Air Pollution Control District

While CARB is responsible for the regulation of mobile emission sources within the state, local air quality management districts and air pollution control districts are responsible for enforcing standards and regulating stationary sources. The Project site is located within the SDAB and is subject to the guidelines and regulations of SDAPCD.

In San Diego County, O_3 and particulate matter are the pollutants of main concern, since exceedances of CAAQS for those pollutants are experienced here in most years. For this reason, the SDAB has been designated as a nonattainment area for the state PM_{10}, $PM_{2.5}$, and O_3 standards. The SDAB is also a federal O_3 attainment (maintenance) area for 1997 8-hour O_3 standard, a O_3 nonattainment area for the 2008 8-hour O_3 standard, and a CO maintenance area (western and central part of the SDAB only). The Project area is in the CO maintenance area (western and central part of the SDAB only).

Federal Attainment Plans

In December 2016, the SDAPCD adopted an update to the Eight-Hour Ozone Attainment Plan for San Diego County (2008 O_3 NAAQS). The 2016 Final Eight-Hour Ozone Attainment Plan for San Diego County indicates that local controls and state programs would allow the region to reach attainment of the federal 8-hour O_3 standard (1997 O_3 NAAQS) by 2018 (SDAPCD 2016b). In this plan, SDAPCD relies on the Regional Air Quality Strategy (RAQS) to demonstrate how the region will comply with the federal O_3 standard. The RAQS details how the region will manage and reduce O_3 precursors (NO_x and VOCs) by identifying measures and regulations intended to reduce these pollutants. The control measures identified in the RAQS generally focus on stationary sources; however, the emissions inventories and projections in the RAQS address all potential sources, including those under the authority of CARB and EPA. Incentive programs for reduction of emissions from heavy-duty diesel vehicles, off-road equipment, and school buses are also established in the RAQS.

Currently, the County is designated as moderate nonattainment for the 2008 O_3 NAAQS and maintenance for the 1997 O_3 NAAQS. As documented in the 2016 Final Eight-Hour Ozone Attainment Plan for San Diego County, the County has a likely chance of obtaining attainment due to the transition to low emission cars, stricter new source review rules, and continuing the requirement of general conformity for military growth and the San Diego International Airport. SDAPCD will also continue emission control measures including ongoing implementation of existing regulations in ozone precursor reduction to stationary and area-wide sources, subsequent inspections of facilities and sources, and the adoption of laws requiring Best Available Retrofit Control Technology for control of emissions (SDAPCD 2016b).

State Attainment Plans

SDAPCD and SANDAG are responsible for developing and implementing the clean air plan for attainment and maintenance of the ambient air quality standards in the SDAB. The RAQS for the SDAB was initially adopted in 1991 and is updated every 3 years, most recently in 2016 (SDAPCD 2016c). The RAQS outlines SDAPCD's plans and control measures designed to attain the CAAQS for O_3. The RAQS relies on information from CARB and SANDAG, including mobile and area source emissions, as well as information regarding projected growth in the County and the cities in the County, to forecast future emissions and then determine from that the strategies necessary for the reduction of emissions through regulatory controls. The CARB mobile source emission projections and SANDAG growth projections are based on population, vehicle trends, and land use plans developed by the County and the cities in the County as part of the development of their general plans (SANDAG 2017a, 2017b).

In December 2016, SDAPCD adopted the revised RAQS for the County. Since 2007, the San Diego region has reduced daily VOC emissions and NO_x emissions by 3.9% and 7.0%, respectively; SDAPCD expects to continue reductions through 2035 (SDAPCD 2016c). These reductions were achieved through implementation of six VOC control measures and three NO_x control measures adopted in SDAPCD's 2009 RAQS (SDAPCD 2009a); in addition, SDAPCD is considering additional measures, including three VOC measures and four control measures to reduce 0.3 daily tons of VOCs and 1.2 daily tons of NO_x, provided they are found to be feasible region-wide. In addition, SDAPCD has implemented nine incentive-based programs, has worked with SANDAG to implement regional transportation control measures, and has reaffirmed the state emission offset repeal.

In regard to particulate matter emissions reduction efforts, in December 2005, SDAPCD prepared a report titled "Measures to Reduce Particulate Matter in San Diego County" to address implementation of Senate Bill 656 in San Diego County (Senate Bill 656 required additional controls to reduce ambient concentrations of PM_{10} and $PM_{2.5}$) (SDAPCD 2005). In the report, SDAPCD evaluated the implementation of source-control measures that would reduce particulate matter emissions associated with residential wood combustion; various construction activities including earthmoving, demolition, and grading; bulk material storage and handling; carryout and trackout removal and cleanup methods; inactive disturbed land; disturbed open areas; unpaved parking lots/staging areas; unpaved roads; and windblown dust (SDAPCD 2005).

SDAPCD Rules and Regulations

As stated previously, SDAPCD is responsible for planning, implementing, and enforcing federal and state ambient standards in the SDAB. The following rules and regulations apply to all sources in the jurisdiction of SDAPCD:

- **SDAPCD Regulation IV: Prohibitions; Rule 50: Visible Emissions.** Prohibits any activity causing air contaminant emissions darker than 20% opacity for more than an aggregate of 3 minutes in any consecutive 60-minute time period. In addition, Rule 50 prohibits any diesel pile-driving hammer activity causing air contaminant emissions for a period or periods aggregating more than 4 minutes during the driving of a single pile (SDAPCD 1997).
- **SDAPCD Regulation IV: Prohibitions; Rule 51: Nuisance.** Prohibits the discharge, from any source, of such quantities of air contaminants or other materials that cause or have a tendency to cause injury, detriment, nuisance, annoyance to people and/or the public, or damage to any business or property (SDAPCD 1976).
- **SDAPCD Regulation IV: Prohibitions; Rule 55: Fugitive Dust.** Regulates fugitive dust emissions from any commercial construction or demolition activity capable of generating fugitive dust emissions, including active operations, open storage piles, and inactive

disturbed areas, as well as track-out and carry-out onto paved roads beyond a project site (SDAPCD 2009b).

- **SDAPCD Regulation IV: Prohibitions; Rule 67.0.1: Architectural Coatings.** Requires manufacturers, distributors, and end users of architectural and industrial maintenance coatings to reduce VOC emissions from the use of these coatings, primarily by placing limits on the VOC content of various coating categories (SDAPCD 2015).

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5 REGIONAL AND LOCAL AIR QUALITY

5.1 SDAB Attainment Designation

Pursuant to the 1990 CAA Amendments, EPA classifies air basins (or portions thereof) as "attainment" or "nonattainment" for each criteria air pollutant, based on whether the NAAQS have been achieved. Generally, if the recorded concentrations of a pollutant are lower than the standard, the area is classified as "attainment" for that pollutant. If an area exceeds the standard, the area is classified as "nonattainment" for that pollutant. As previously discussed, these standards are set by EPA or CARB for the maximum level of a given air pollutant that can exist in the outdoor air without unacceptable effects on human health or the public welfare. If there is not enough data available to determine whether the standard is exceeded in an area, the area is designated as "unclassified" or "unclassifiable."

The designation of "unclassifiable/attainment" means that the area meets the standard or is expected to be meet the standard despite a lack of monitoring data. Areas that achieve the standards after a nonattainment designation are redesignated as maintenance areas and must have approved maintenance plans to ensure continued attainment of the standards. The California Clean Air Act, like its federal counterpart, called for the designation of areas as "attainment" or "nonattainment," but based on the CAAQS rather than the NAAQS.

Table 2 summarizes SDAB's federal and state attainment designations for each of the criteria pollutants.

Table 2
SDAB Attainment Designation

Pollutant	Federal Designation	State Designation
O_3 (1-hour)	Attainment (maintenance)[a]	Nonattainment
O_3 (8-hour – 1997) (8-hour – 2008)	Attainment (maintenance) Nonattainment (moderate)	Nonattainment
CO	Unclassifiable/attainment[b]	Attainment
PM_{10}	Unclassifiable/attainment	Nonattainment
$PM_{2.5}$	Unclassifiable/attainment	Nonattainment
NO_2	Unclassifiable/attainment	Attainment
SO_2	Not designated[c]	Attainment
Lead	Attainment	Attainment
Sulfates	(No federal standard)	Attainment
Hydrogen sulfide	(No federal standard)	Unclassified
Visibility-reducing particles	(No federal standard)	Unclassified
Vinyl chloride	(No federal standard)	No designation

Sources: EPA 2017b (federal); CARB 2016b (state).
Definitions: attainment = meets the standards; attainment/maintenance = achieve the standards after a nonattainment designation; nonattainment = does not meet the standards; unclassified or unclassifiable = insufficient data to classify; unclassifiable/attainment = meets the standard or is expected to be meet the standard despite a lack of monitoring data.

Notes: SDAB = San Diego; O_3 = ozone; CO = carbon monoxide; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; NO_2 = nitrogen dioxide; SO_2 = sulfur dioxide.

[a] The federal 1-hour standard of 0.12 parts per million (ppm) was in effect from 1979 through June 15, 2005. The revoked standard is referenced here because it was employed for such a long period and because this benchmark is addressed in SIPs.

[b] The western and central portions of the SDAB are designated attainment, while the eastern portion is designated unclassifiable/ attainment.

[c] Federal designations for SO_2 are on hold by EPA(EPA 2016b).

5.2 Air Quality Monitoring Data

SDAPCD operates a network of ambient air monitoring stations throughout the County, which measure ambient concentrations of pollutants and determine whether the ambient air quality meets the CAAQS and the NAAQS. SDAPCD monitors air quality conditions at 10 locations throughout the basin. The Camp Pendleton monitoring station represents the closest monitoring station to the Project site for concentrations for O_3, $PM_{2.5}$, and NO_2. The Escondido monitoring station is the closest monitoring station for CO. The closest monitoring station for SO_2 is the El Cajon monitoring station. The San Diego–Kearny Villa Road monitoring station is the closest station monitoring for PM_{10}. Ambient concentrations of pollutants from 2016 through 2018 are presented in Table 3. The number of days exceeding the O_3, PM_{10}, and $PM_{2.5}$ CAAQS and NAAQS is shown in Table 3. Air quality within the Project region was in compliance with both CAAQS and NAAQS for NO_2, CO, and SO_2 during this monitoring period.

Table 3
Local Ambient Air Quality Data

Monitoring Station	Unit	Averaging Time	Agency / Method	Ambient Air Quality Standard	Measured Concentration by Year			Exceedances by Year		
					2016	*2017*	*2018*	*2016*	*2017*	*2018*
Ozone (O_3)										
Camp Pendleton	ppm	Maximum 1-hour concentration	State	0.09	0.083	0.094	0.084	0	0	0
	ppm	Maximum 8-hour concentration	State	0.070	0.073	0.082	0.069	5	5	0
			Federal	0.070	0.073	0.081	0.068	4	4	0
Nitrogen Dioxide (NO_2)										
Camp Pendleton	ppm	Maximum 1-hour concentration	State	0.18	0.072	0.063	0.048	0	0	0
			Federal	0.100	0.072	0.063	0.048	0	0	0
	ppm	Annual concentration	State	0.030	0.006	0.006	0.006	0	0	0
			Federal	0.053	0.006	0.006	0.006	0	0	0
Carbon Monoxide (CO)										
Escondido[a]	ppm	Maximum 1-hour concentration	State	20	3.1	2.0	1.9	0	0	0
			Federal	35	3.1	2.0	1.9	0	0	0
	ppm	Maximum 8-hour concentration	State	9.0	2.0	1.5	1.4	0	0	0
			Federal	9	2.0	1.5	1.4	0	0	0

Table 3
Local Ambient Air Quality Data

Monitoring Station	Unit	Averaging Time	Agency / Method	Ambient Air Quality Standard	Measured Concentration by Year			Exceedances by Year		
					2016	*2017*	*2018*	*2016*	*2017*	*2018*
Sulfur Dioxide (SO_2)										
El Cajon	ppm	Maximum 1-hour concentration	Federal	0.075	0.018	0.011	0.004	0	0	0
	ppm	Maximum 24-hour concentration	State	0.04	0.0005	0.0004	0.0004	0	0	0
			Federal	0.140	0.0005	0.0004	0.0004	0	0	0
	ppm	Annual concentration	Federal	0.030	0.0001	0.0001	0.0001	—	—	—
Coarse Particulate Matter (PM_{10})[b]										
San Diego–Kearny Villa Road	$\mu g/m^3$	Maximum 24-hour concentration	State	50	35	47	38	0 (0)	0 (0)	0 (0)
			Federal	150	36	46	38	0 (0)	0 (0)	0 (0)
	$\mu g/m^3$	Annual concentration	State	20	ND	17.6	18.4	—	—	—
Fine Particulate Matter ($PM_{2.5}$)[b]										
Camp Pendleton	$\mu g/m^3$	Maximum 24-hour concentration	Federal	35	34.4	26.0	30.5	0 (0)	0 (0)	0 (0)
	$\mu g/m^3$	Annual concentration	State	12	9.7	—	—	—	—	—
			Federal	12.0	9.7	—	—	—	—	—

Sources: CARB 2019; EPA 2019.

Notes: ppm = parts per million; — = not available or applicable; $\mu g/m^3$ = micrograms per cubic meter; ND = insufficient data available to determine the value.

Data taken from CARB iADAM (http://www.arb.ca.gov/adam) and EPA AirData (http://www.epa.gov/airdata/) represent the highest concentrations experienced over a given year.

Exceedances of federal and state standards are only shown for O_3 and particulate matter. Daily exceedances for particulate matter are estimated days because PM_{10} and $PM_{2.5}$ are not monitored daily. All other criteria pollutants did not exceed federal or state standards during the years shown. There is no federal standard for 1-hour O_3, annual PM_{10}, or 24-hour SO_2, nor is there a state 24-hour standard for $PM_{2.5}$.

The Camp Pendleton monitoring station is located at 21441-W B Street, Oceanside, California.

The Escondido monitoring station is located at 600 East Valley Pkwy, Escondido, California.

The El Cajon monitoring station is located at 10537 Floyd Smith Drive, El Cajon, California.

The San Diego–Kearny Villa monitoring station is located at 6123A Kearny Villa Road, San Diego, California.

The San Diego – Rancho Carmel Drive monitoring station is located at 11403 Rancho Carmel Drive, San Diego, California.

a The 2016 and 2017 monitoring values are from the Escondido monitoring station and the 2018 monitoring values are from the Rancho Carmel Drive monitoring station.

b Measurements of PM_{10} and $PM_{2.5}$ are usually collected every 6 days and every 1 to 3 days, respectively. Number of days exceeding the standards is a mathematical estimate of the number of days concentrations would have been greater than the level of the standard had each day been monitored. The numbers in parentheses are the measured number of samples that exceeded the standard.

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6 THRESHOLDS OF SIGNIFICANCE

The State of California has developed guidelines to address the significance of air quality impacts based on Appendix G of the CEQA Guidelines (14 CCR 15000 et seq.), which provides guidance that a project would have a significant environmental impact if it would:

1. Conflict with or obstruct implementation of the applicable air quality plan.
2. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard.
3. Expose sensitive receptors to substantial pollutant concentrations.
4. Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

Appendix G of the CEQA Guidelines (14 CCR 15000 et seq.) indicates that, where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to determine whether a project would have a significant impact on air quality.

As part of its air quality permitting process, SDAPCD has established thresholds in Rule 20.2 requiring the preparation of air quality impact assessments for permitted stationary sources. SDAPCD sets forth quantitative emission thresholds below which a stationary source would not have a significant impact on ambient air quality. Project-related air quality impacts estimated in this environmental analysis would be considered significant if any of the applicable significance thresholds presented in Table 4 are exceeded.

For CEQA purposes, these screening criteria can be used as numeric methods to demonstrate that the Project's total emissions would or would not result in a significant impact to air quality.

Table 4
SDAPCD Air Quality Significance Thresholds

Construction Emissions	
Pollutant	*Total Emissions (Pounds per Day)*
Coarse particulate matter (PM_{10})	100
Fine particulate matter ($PM_{2.5}$)	55
Oxides of nitrogen (NO_x)	250
Sulfur oxides (SO_x)	250
Carbon monoxide (CO)	550
Volatile organic compounds (VOCs)	137*

Table 4
SDAPCD Air Quality Significance Thresholds

Operational Emissions			
	Total Emissions		
Pollutant	*Pounds per Hour*	*Pounds per Day*	*Tons per Year*
Coarse particulate matter (PM_{10})	—	100	15
Fine particulate matter ($PM_{2.5}$)	—	55	10
Oxides of nitrogen (NO_x)	25	250	40
Sulfur oxides (SO_x)	25	250	40
Carbon monoxide (CO)	100	550	100
Lead and lead compounds	—	3.2	0.6
Volatile organic compounds (VOCs)	—	137[a]	13.7

Source: SDAPCD 2016a.
Notes: SDAPCD = San Diego Air Pollution Control District.
[a] VOC threshold based on the significance thresholds recommended by the Monterey Bay Unified Air Pollution Control District for the North Central Coast Air Basin, which has similar federal and state attainment status as the SDAB for O_3.

The thresholds listed in Table 4 represent screening-level thresholds that can be used to evaluate whether Project-related emissions would cause a significant impact on air quality. Emissions below the screening-level thresholds would not cause a significant impact. In the event that emissions exceed these thresholds, modeling would be required to demonstrate that the Project's total air quality impacts result in ground-level concentrations that are below the CAAQS and NAAQS, including appropriate background levels. For non-attainment pollutants, if emissions exceed the thresholds shown in Table 4, the Project could have the potential to result in a cumulatively considerable net increase in these pollutants and thus could have a significant impact on the ambient air quality.

SDAPCD Rule 51 (Public Nuisance) prohibits emission of any material that causes nuisance to a considerable number of persons or endangers the comfort, health, or safety of any person (SDAPCD 1976). A project that proposes a use that would produce objectionable odors would be deemed to have a significant odor impact if it would affect a considerable number of off-site receptors.

7 IMPACTS

7.1 Would the Project conflict with or obstruct implementation of the applicable air quality plan?

Analysis

As stated in Section 4.3, Local, SDAPCD and SANDAG are responsible for developing and implementing the clean air plans for attainment and maintenance of the NAAQS and CAAQS in the SDAB; specifically, the SIP and RAQS.[3] The federal O_3 maintenance plan, which is part of the SIP, was adopted in 2016. The SIP includes a demonstration that current strategies and tactics will maintain acceptable air quality in the SDAB based on the NAAQS. The RAQS was initially adopted in 1991 and is updated every 3 years (most recently in 2009). The RAQS outlines SDAPCD's plans and control measures designed to attain the CAAQS for O_3. The SIP and RAQS rely on information from CARB and SANDAG, including mobile and area source emissions, as well as information regarding projected growth in San Diego County and the cities in the County, to project future emissions and then determine from that the strategies necessary for the reduction of emissions through regulatory controls. CARB mobile source emission projections and SANDAG growth projections are based on population, vehicle trends, and land use plans developed by San Diego County and the cities in the County as part of the development of their general plans.

If a project proposes development that is greater than that anticipated in the local plan and SANDAG's growth projections, the project might be in conflict with the SIP and RAQS and may contribute to a potentially significant cumulative impact on air quality. The Project site is zoned P-M, Planned Industrial, which includes light industrial and manufacturing uses, corporate business, and office uses not catering directly to the public. The proposed residential development is not consistent with the existing zoning and General Plan land use designations for the Project site. As such, as part of the approval process, the Project applicant is requesting a conditional use permit in accordance with Carlsbad Municipal Code Section 21.42.140, Residential Uses in the P-M Zone.

Implementation of the Project would result in an increase in housing of 192 units. The most recent Regional Housing Needs Assessment from SANDAG stated that Carlsbad needs to build 430 units per year from 2021 through 2029 (SANDAG 2019). Furthermore, the City projected a deficit of 1,062 very-low and low income units and 238 moderate and above moderate income units (City of Carlsbad 2019). The Project is expected to bring 192 units to market in 2022 but

3 For the purpose of this discussion, the relevant federal air quality plan is the O_3 maintenance plan (SDAPCD 2016b). The RAQS is the applicable plan for purposes of state air quality planning. Both plans reflect growth projections in the SDAB.

is expected to be brought online in phases as buildings are completed, which would be within SANDAG's growth projection for housing for that year. Therefore, the Project would not conflict with SANDAG's regional growth forecast for the City.

Conclusion

The increase in the housing units and associated vehicle source emissions is not anticipated to result in air quality impacts that were not envisioned in the growth projections and RAQS, and this minor increase in residential units in the region would not obstruct or impede implementation of local air quality plans. Based on the analysis above, implementation of the Project would not result in development in excess of that anticipated in local plans or increases in population/housing growth beyond those contemplated by SANDAG. As such, vehicle trip generation and planned development for the Project are considered to be anticipated in the SIP and RAQS. Because the proposed land uses and associated vehicle trips are anticipated in local air quality plans, the Project would be consistent at a regional level with the underlying growth forecasts in the RAQS. Impacts would be **less than significant**.

7.2 Would the Project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?

Air pollution is largely a cumulative impact. The nonattainment status of regional pollutants is a result of past and present development, and SDAPCD develops and implements plans for future attainment of the NAAQS and CAAQS. Based on these considerations, project-level thresholds of significance for criteria pollutants are relevant in the determination of whether the Project's individual emissions would have a cumulatively significant impact on air quality.

Construction Impacts

Analysis

Construction of the Project components would result in a temporary addition of pollutants to the local airshed caused by soil disturbance, fugitive dust emissions, and combustion pollutants from on-site construction equipment, as well as from off-site vendor trucks delivering construction materials. Construction emissions can vary substantially from day to day, depending on the level of activity, the specific type of operation, and, for dust, the prevailing weather conditions.

Emissions from the construction phase of Project components were estimated using the California Emissions Estimator Model (CalEEMod) Version 2016.3.2[4]. For the purposes of modeling, it was assumed that construction of the Project would begin in January 2021 and would last approximately 12 months.

Table 5 provides the construction timeline, potential phasing, construction equipment mix, and vehicle trips assumed for estimating Project-generated construction emissions. The construction schedule has been developed based on available information provided by the Project applicant, typical construction practices, and best engineering judgment. Construction phasing is intended to represent a schedule of anticipated activities for use in estimating potential Project-generated construction emissions.

Table 5
Construction Scenario Assumptions

Construction Phase (Duration)	One-Way Vehicle Trips			Equipment		
	Average Daily Worker Trips	*Average Daily Vendor Truck Trips*	*Total Haul Truck Trips*	*Equipment Type*	*Quantity*	*Usage Hours*
Site preparation[a] (10 days)	18	0	0	Rubber-tired dozers	3	8
				Tractors/loaders/backhoes	4	8
Grading[a] (30 days)	20	0	0	Excavators	2	8
				Graders	1	8
				Rubber-tired dozers	1	8
				Scrapers	2	8
				Tractors/loaders/backhoes	2	8
Trenching (10 days)	8	0	0	Excavators	1	8
				Tractors/loaders/backhoes	1	8
				Trenchers	1	8
Building construction (200 days)	204	46	0	Cranes	1	8
				Forklifts	3	8
				Generator sets	1	8
				Tractors/loaders/backhoes	3	8
				Welders	1	8
Paving (20 days)	16	4	0	Pavers	3	8
				Paving equipment	3	8
				Rollers	3	8
				Tractors/Loaders/Backhoes	2	8

4 CalEEMod is a statewide land use emissions computer model designed to provide a uniform platform to calculate construction and operational emissions from land use development projects. The model was developed for the California Air Pollution Control Officers Association in collaboration with multiple air districts across the state. Numerous lead agencies in the state, including SDAPCD, use CalEEMod to estimate greenhouse gas emissions in accordance with CEQA Guidelines Section 15064.4(a)(1).

Table 5
Construction Scenario Assumptions

Construction Phase (Duration)	One-Way Vehicle Trips			Equipment		
	Average Daily Worker Trips	*Average Daily Vendor Truck Trips*	*Total Haul Truck Trips*	*Equipment Type*	*Quantity*	*Usage Hours*
				Signal Board	1	8
Architectural coating (20 days)	42	0	0	Air compressors	1	8

Note: See Appendix A for additional details.
[a] The CalEEMod modeling parameters for the Site Preparation and Grading phases of the Project's construction period are conservative because they do not reflect that the Project site previously was cleared and graded. While the Project site would be subject to some additional grading activities to ready the site for development, given the passage of time since the previously conducted clearing and grading, such activities are not expected to last for 40 days. As a result, the emissions estimates presented herein are conservative and likely serve to over-estimate the Project's construction-related GHG emissions.

The equipment mix assumptions were based on Project design documents, review of related documents, and CalEEMod default equipment, where appropriate. The equipment mix is meant to represent a reasonably conservative estimate of construction activity. For the analysis, it is generally assumed that heavy construction equipment would be operating at the site for approximately 8 hours per day, 5 days per week. Default assumptions provided in CalEEMod were used to determine worker trips and vendor truck trips for each potential construction phase. The default CalEEMod trip distance for construction vehicles was assumed, which was a one-way distance of 10.8 miles for worker trips, 7.3 miles for vendor truck trips, and 20 miles for haul truck trips.

Implementation of the Project would generate criteria air pollutant emissions from entrained dust, off-road equipment, vehicle emissions, architectural coatings, and asphalt pavement application. Entrained dust results from the exposure of earth surfaces to wind from the direct disturbance and movement of soil, resulting in PM_{10} and $PM_{2.5}$ emissions. Construction of Project components would be subject to SDAPCD Rule 55 – Fugitive Dust Control. Compliance with Rule 55 would limit fugitive dust (PM_{10} and $PM_{2.5}$) that may be generated during grading and construction activities. Standard construction practices that would be employed to reduce fugitive dust emissions include watering of the active sites two times per day, depending on weather conditions.

Internal combustion engines used by construction equipment, vendor trucks (i.e., delivery trucks), and worker vehicles would result in emissions of VOCs, NO_x, CO, PM_{10}, and $PM_{2.5}$. The application of architectural coatings, such as exterior application/interior paint and other finishes, and application of asphalt pavement would also produce VOC emissions; however, the contractor is required to procure architectural coatings from a supplier in compliance with the requirements of SDAPCD Rule 67.0.1 for Architectural Coatings. The Project is assumed to be constructed with low-VOC coatings, which would be 5 grams per liter (g/L) for interior applications and 50 g/L for exterior applications. It was assumed that the parking lot would comply with SDAPCD Rule 67.0.1 for Architectural Coatings and would use a coating not exceeding 100 g/L.

Table 6 shows the estimated maximum unmitigated daily construction emissions associated with the conceptual construction phases of the Project. Complete details of the emissions calculations are provided in Appendix A of this document.

Table 6
Estimated Maximum Daily Construction Criteria Air Pollutant Emissions

Year	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Pounds per Day					
2021	28.23	50.05	55.14	0.11	10.32	6.39
SDAPCD threshold	*137*	*250*	*550*	*250*	*100*	*55*
Threshold exceeded?	No	No	No	No	No	No

Notes: VOC = volatile organic compound; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; SDAPCD = San Diego Air Pollution Control District.
See Appendix A for complete results.
The values shown are the maximum summer or winter daily emissions results from CalEEMod.

Conclusion

As shown in Table 6, daily construction emissions for the Project would not exceed SDAPCD's significance thresholds for VOCs, NO_x, CO, SO_x, PM_{10}, or $PM_{2.5.}$ Therefore, the Project would result in a **less than significant** impact.

Operational Impacts

Analysis

<u>Area</u>

The area source category calculates direct sources of air pollutant emissions located at the Project site, including consumer product use, architectural coatings, and landscape maintenance equipment. This does not include the emissions associated with natural gas usage in space heating, water heating, and stoves as these are calculated in the building energy use module. The Project will not have fireplaces or woodstoves. CalEEMod defaults were used for operational hours and number of days per year.

Consumer products are various solvents used in non-industrial applications which emit VOCs during their product use. These typically include cleaning supplies, kitchen aerosols, cosmetics and toiletries. Consumer product VOC emissions are estimated in CalEEMod based on the floor area of residential and nonresidential buildings and on the default factor of pounds of VOC per building square foot per day. For parking lot land uses, CalEEMod estimates VOC emissions associated with use of parking surface degreasers based on a square footage of parking surface area and pounds of VOC per square foot per day. The CalEEMod default utilization rates and emission factors were assumed.

This VOC emissions associated with the reapplication rate and coating for each building surface type and parking surface was also estimated using CalEEMod. The reapplication rate is the percentage of the total surface area that is repainted each year. A default of 10% is used, meaning that 10% of the surface area is repainted each year (i.e., all surface areas are repainted once every 10 years). Daily emissions divide the annual rate by 365 days per year. The Project is assumed to be constructed with low-VOC coatings, which would be 5 g/L for interior applications and 50 g/L for exterior applications. However, for reapplication of architectural coatings, it was conservatively assumed that coatings with a VOC content of 50 g/L would be used on the interior and 100 g/L would be used for exterior. It was assumed that the parking lot would comply with SDAPCD Rule 67.0.1 for Architectural Coatings and would use a coating not exceeding 100 g/L.

Landscape maintenance includes fuel combustion emissions from equipment such as lawn mowers, rototillers, shredders/grinders, blowers, trimmers, chainsaws, and hedge trimmers, as well as air compressors, generators, and pumps. The emissions associated from landscape equipment use were estimated using CalEEMod. The emission factors are multiplied by the number of summer days that represent the number of operational days.

Energy

As represented in CalEEMod, energy sources include emissions associated with natural gas usage (non-hearth). In accordance with the City's Ordinance No. CS-348, the Project would use electric-based water heating. The Project would also have electric heating, ventilation, and air conditioning (HVAC) and an electric swimming pool water heater. Therefore, the energy use associated with water heating, HVAC, and swimming pool heating was applied to the electric load for the Project. Natural gas would only be used for cooking onsite. Electricity use would contribute indirectly to criteria air pollutant emissions; however, the emissions from electricity use are only quantified for greenhouse gases in CalEEMod, since criteria pollutant emissions occur at the site of the power plant, which is typically off site. CalEEMod default values for energy consumption for each land use were applied for the Project analysis. The energy use from residential land uses is calculated in CalEEMod based on the Residential Appliance Saturation Survey (CAPCOA 2017).

The Project would be designed to include a solar photovoltaic rooftop system. The Project would also include use of LED lighting or other efficient lighting for at least 75% of the total luminaires. The Project would also include a solar water heating system on site to heat the swimming pool. The Project would also include Energy Star appliances.

As explained in Section 4.2, State, Title 24 of the California Code of Regulations serves to enhance and regulate California's building standards. The most recent amendments to Title 24, Part 6, referred to as the 2019 standards, became effective on January 1, 2020. However, CalEEMod assumes compliance with the previous 2016 standards. Annual natural gas (non-hearth) and electricity emissions were estimated in CalEEMod using the emissions factors for San Diego Gas & Electric Company (SDG&E), which would be the energy source provider for the Project. For operational year 2022, the emission factors for SDG&E were adjusted to reflect SDG&E's compliance with the Renewables Portfolio Standard, which is based on the renewable procurement percentage of 44% from the 2017 SDG&E Renewables Portfolio Standard submittal (CEC 2018).

Mobile Sources (Motor Vehicles)

Following the completion of construction activities, the Project would generate VOC, NO_x, CO, SO_x, PM_{10}, and $PM_{2.5}$ emissions from mobile sources (vehicular traffic) as a result of residents and employees associated with the 192 additional residential units. The CalEEMod Version 2016.3.2 was used to estimate daily emissions from proposed vehicular sources (refer to Appendix A). CalEEMod Version 2016.3.2 default data, including temperature, trip characteristics, variable start information, emissions factors, and trip distances, were conservatively used for the model inputs. The Project is estimated to generate up to 1,152 one-way trips per day (Appendix B and Linscott, Law & Greenspan 2020). Project-related traffic was assumed to include a mixture of vehicles in accordance with the model outputs for traffic. Emission factors representing the vehicle mix and emissions for 2022 were conservatively used to estimate emissions associated with vehicular sources. The 2022 operational year represents the first full year the Project would be operational.

Table 7 presents the maximum daily emissions associated with the operation of the Project after all phases of construction have been completed. Complete details of the emissions calculations are provided in Appendix A of this document. Emissions represent maximum of summer and winter. "Summer" emissions are representative of the conditions that may occur during the O_3 season (May 1 to October 31), and "winter" emissions are representative of the conditions that may occur during the balance of the year (November 1 to April 30).

Table 7
Estimated Maximum Daily Operational Criteria Air Pollutant Emissions

Source	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Pounds per Day					
Area	4.87	0.18	15.90	0.00	0.09	0.09
Energy	0.01	0.08	0.03	0.00	0.01	0.01
Mobile	1.67	6.67	17.15	0.06	4.99	1.37
Total	6.55	6.93	33.08	0.06	5.09	1.47
SDAPCD threshold	*137*	*250*	*550*	*250*	*100*	*55*
Threshold exceeded?	No	No	No	No	No	No

Notes: VOC = volatile organic compound; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; SDAPCD = San Diego Air Pollution Control District.
See Appendix A for complete results.
The values shown are the maximum summer or winter daily emissions results from CalEEMod.

As shown in Table 7, the maximum daily operational emissions would not exceed SDAPCD's thresholds for VOCs, CO, NO_x, SO_x, PM_{10}, or $PM_{2.5}$ during the operation of the Project.

Table 8 shows the annual operational emissions estimated for the Project.

Table 8
Estimated Annual Operational Criteria Air Pollutant Emissions

Source	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Tons per Year					
Area	0.84	0.02	1.43	0.00	0.01	0.01
Energy	0.00	0.01	0.01	0.00	0.00	0.00
Mobile	0.29	1.22	3.07	0.01	0.89	0.24
Total	1.13	1.25	4.51	0.01	0.90	0.25
SDAPCD threshold	*13.7*	*40*	*100*	*40*	*15*	*10*
Threshold exceeded?	No	No	No	No	No	No

Notes: VOC = volatile organic compound; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; SDAPCD = San Diego Air Pollution Control District.
See Appendix A for complete results.

As shown in Table 8, the annual operations emissions for the Project do not exceed SDAPCD's significance thresholds for VOCs, CO, NO_x, SO_x, PM_{10}, or $PM_{2.5}$.

Conclusion

In analyzing cumulative impacts from a project, the analysis must specifically evaluate the project's contribution to the cumulative increase in pollutants for which the SDAB is designated as nonattainment for the CAAQS and NAAQS. If the project does not exceed thresholds and is determined to have less than significant project-specific impacts, it may still contribute to a significant cumulative impact on air quality if the emissions from the project components, in combination with the emissions from other proposed or reasonably foreseeable future projects, are in excess of established thresholds. However, the project would only be considered to have a significant cumulative impact if its contribution accounts for a significant proportion of the cumulative total emissions (i.e., it represents a "cumulatively considerable contribution" to the cumulative air quality impact).

Additionally, for the SDAB, the RAQS serves as the long-term regional air quality planning document for the purpose of assessing cumulative operational emissions within the basin to ensure the SDAB continues to make progress toward NAAQS and CAAQS attainment status. As such, cumulative projects located in the San Diego region would have the potential to result in a cumulative impact to air quality if, in combination, they would conflict with or obstruct implementation of the RAQS. Similarly, individual projects that are inconsistent with the regional planning documents on which the RAQS is based would have the potential to result in cumulative impacts if they represent development beyond regional projections.

The SDAB has been designated as a federal nonattainment area for O_3 and a state nonattainment area for O_3, PM_{10}, and $PM_{2.5}$. PM_{10} and $PM_{2.5}$ emissions associated with construction generally result in near-field impacts. The nonattainment status is the result of cumulative emissions from all sources of these air pollutants and their precursors within the SDAB. As shown in Tables 6 through 8, the emissions of all criteria pollutants from the Project's construction and operational activities would be below the significance levels. Construction would be short term and temporary in nature. Additionally, construction activities required for the implementation of Project components would be considered typical of a residential project and would not require atypical construction practices that would include high-emitting activities. Once construction is completed, construction-related emissions would cease. Operational emissions generated by the Project would not result in a significant impact. As such, the Project would result in less than significant impacts to air quality relative to operational emissions.

Regarding long-term cumulative operational emissions in relation to consistency with local air quality plans, the SIP and RAQS serve as the primary air quality planning documents for the state and SDAB, respectively. The SIP and RAQS rely on SANDAG growth projections based on population, vehicle trends, and land use plans developed by the cities and by the County as part of the development of their general plans. Therefore, projects that propose development that is consistent with the growth anticipated by local plans would be consistent with the SIP and RAQS and would not be considered to result in cumulatively considerable impacts from operational emissions. As discussed in Section 7.1 of this report, the Project is consistent with the SANDAG growth projections. Thus, it would be consistent at a regional level with the underlying growth forecasts in the SIP and RAQS.

As a result, the Project would not result in a cumulatively considerable contribution to regional O_3 concentrations or other criteria pollutant emissions. Cumulative impacts for construction and operation would be **less than significant** for the Project.

7.3 Would the Project expose sensitive receptors to substantial pollutant concentrations?

Carbon Monoxide Hotspots

Analysis

Mobile-source impacts occur on two basic scales of motion. Regionally, Project-related travel will add to regional trip generation and increase the vehicle miles traveled within the local airshed and the SDAB. Locally, Project traffic will be added to the City's roadway system. If such traffic occurs during periods of poor atmospheric ventilation, consists of a large number of vehicles "cold-started" and operating at pollution-inefficient speeds, and operates on roadways already crowded with non-Project traffic, there is a potential for the formation of microscale CO "hotspots" in the area immediately around points of congested traffic. Because of continued improvement in mobile emissions at a rate faster than the rate of vehicle growth and/or congestion, the potential for CO hotspots in the basin is steadily decreasing.

Projects contributing to adverse traffic impacts may result in the formation of CO hotspots. To verify that the Project would not cause or contribute to a violation of the CO standard, a screening evaluation of the potential for CO hotspots was conducted. ~~A Local Mobility Analysis (~~Linscott, Law & Greenspan ~~2020)~~ evaluated the level of service (LOS) (i.e., increased congestion) impacts at intersections affected by the Project (Appendix B). The potential for CO hotspots was evaluated based on the results of the traffic report. The County's CO hotspot screening guidance (County of San Diego 2007) was followed to determine whether the Project would require a site-specific hotspot analysis. The County recommends that a quantitative analysis of CO hotspots be performed for intersections that are operating at or below LOS E and have peak-hour trips exceeding 3,000 trips.

~~A Local Mobility Analysis (Linscott, Law & Greenspan 2020) was prepared for the Project and evaluated whether there would be a change in the LOS (e.g., congestion) at the intersections affected by the Project.~~ Of the intersections evaluated, none would operate at or below LOS E. Therefore, no CO hotspots analysis is required. Based on these considerations, the Project would result in a **less than significant** impact to air quality with regard to potential CO hotspots.

Toxic Air Contaminants

In addition to impacts from criteria pollutants, Project impacts may include emissions of pollutants identified by the state and federal government as TACs or HAPs. The greatest potential for TAC emissions during construction would be DPM emissions from heavy equipment operations and heavy-duty trucks, and the associated health impacts to sensitive receptors. The closest sensitive receptors would be any receptor located directly adjacent to the proposed alignments and associated facilities.

Health effects from carcinogenic air toxics are usually described in terms of cancer risk. The SDAPCD recommends an incremental cancer risk threshold of 10 in 1 million. "Incremental cancer risk" is the likelihood that a person continuously exposed to concentrations of TACs resulting from a project over a 30-year lifetime will contract cancer based on the use of standard risk-assessment methodology. Construction of Project components would not require the extensive use of heavy-duty construction equipment, which is subject to a CARB Airborne Toxics Control Measure for in-use diesel construction equipment to reduce DPM emissions, and would not involve extensive use of diesel trucks, which are also subject to an Airborne Toxics Control Measure. Construction of the Project would occur over a period of 1 year and would be periodic and short term within each phase. Following completion of construction activities, Project-related TAC emissions would cease. Additionally, no diesel-powered equipment would be used during Project operation. The closest sensitive receptor is a residence approximately 410 feet to the southwest of the Project site.

Health Effects of Criteria Air Pollutants

Analysis

Construction and operation of the Project would not result in emissions that exceed SDAPCD's emission thresholds for any criteria air pollutants. The SDAPCD thresholds are based on the SDAB complying with the NAAQS and CAAQS which are protective of public health; therefore, no adverse effects to human health would result from the Project. The following provides a general discussion of criteria air pollutants and their health effects.

Regarding VOCs, some VOCs would be associated with motor vehicles and construction equipment, while others are associated with architectural coatings, the emissions of which would not result in exceedances of SDAPCD's thresholds. Generally, the VOCs in architectural coatings are of relatively low toxicity. Additionally, SDAPCD Rule 67.0.1 restricts the VOC content of coatings for both construction and operational applications.

In addition, VOCs and NO_x are precursors to O_3, for which the SDAB is designated as nonattainment with respect to the NAAQS and CAAQS (the SDAB is designated by EPA as an attainment area for the 1-hour O_3 NAAQS standard and 1997 8-hour NAAQS standard). The health effects associated with O_3, as discussed in Section 3.1, Criteria Air Pollutants, are generally associated with reduced lung function. The contribution of VOCs and NO_x to regional ambient O_3 concentrations is the result of complex photochemistry. The increases in O_3 concentrations in the

SDAB due to O_3 precursor emissions tend to be found downwind from the source location to allow time for the photochemical reactions to occur. However, the potential for exacerbating excessive O_3 concentrations would also depend on the time of year that the VOC emissions would occur because exceedances of the O_3 NAAQS and CAAQS tend to occur between April and October, when solar radiation is highest.

The holistic effect of a single project's emissions of O_3 precursors is speculative due to the lack of quantitative methods to assess this impact. Nonetheless, the VOC and NO_x emissions associated with Project construction could minimally contribute to regional O_3 concentrations and the associated health impacts. Due to the minimal contribution during construction and operation, as well as the existing good air quality in coastal San Diego areas, health impacts would be considered less than significant.

Similar to O_3, construction of the Project would not exceed thresholds for PM_{10} or $PM_{2.5}$ and would not contribute to exceedances of the NAAQS and CAAQS for particulate matter. The Project would also not result in substantial DPM emissions during construction and operation and therefore would not result in significant health effects related to DPM exposure. Due to the minimal contribution of particulate matter during construction and operation, health impacts would be considered less than significant.

Regarding NO_2, according to the construction emissions analysis, construction of the Project would not contribute to exceedances of the NAAQS and CAAQS for NO_2. As described in Section 3.1, NO_2 and NO_x health impacts are associated with respiratory irritation, which may be experienced by nearby receptors during the periods of heaviest use of off-road construction equipment. However, these operations would be relatively short term, and the Project would be required to comply with SDAPCD Rule 55, which limits the amount of fugitive dust generated during construction. Additionally, off-road construction equipment would be operating on various portions of the site and would not be concentrated in one portion of the site at any one time. Construction of the Project would not require any stationary emission sources that would create substantial, localized NO_x impacts.

Therefore, health impacts from Project-related criteria air pollutant emissions would be considered less than significant.

Conclusion

The VOC and NO_x emissions, as described previously, would minimally contribute to regional O_3 concentrations and the associated health effects. In addition to O_3, NO_x emissions would not contribute to potential exceedances of the NAAQS and CAAQS for NO_2. As shown in Table 3, the existing NO_2 concentrations in the area are well below the NAAQS and CAAQS standards.

Thus, it is not expected the Project's operational NO_x emissions would result in exceedances of the NO_2 standards or contribute to the associated health effects. CO tends to be a localized impact associated with congested intersections. The associated CO "hotspots" were discussed previously as a less than significant impact. Thus, the Project's CO emissions would not contribute to significant health effects associated with this pollutant. PM_{10} and $PM_{2.5}$ would not contribute to potential exceedances of the NAAQS and CAAQS for particulate matter and would not obstruct the SDAB from coming into attainment for these pollutants and would not contribute to significant health effects associated with particulates. Therefore, overall health impacts associated with criteria air pollutants would be considered **less than significant**.

7.4 Would the Project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

Construction Impacts

Odors would be generated from vehicles and/or equipment exhaust emissions during construction of the Project. Odors produced during construction would be attributable to concentrations of unburned hydrocarbons from tailpipes of construction equipment and architectural coatings. Such odors are temporary and for the types of construction activities anticipated for Project components, would generally occur at magnitudes that would not affect substantial numbers of people. Therefore, impacts associated with odors during construction would be considered **less than significant**.

Operational Impacts

Due to the subjective nature of odor impacts, the number of variables that can influence the potential for an odor impact, and the variety of odor sources, there are no quantitative or formulaic methodologies to determine if potential odors would have a significant impact. Examples of land uses and industrial operations that are commonly associated with odor complaints include agricultural uses, wastewater treatment plants, food processing facilities, chemical plants, composting, refineries, landfills, dairies, and fiberglass molding facilities. In addition to the odor source, the distance between the sensitive receptor(s) and the odor source, as well as the local meteorological conditions, are considerations in the potential for a project to frequently expose the public to objectionable odors. Although localized air quality impacts are focused on potential impacts to sensitive receptors, such as residences and schools, other land uses where people may congregate (e.g., workplaces) or uses with the intent to attract people (e.g., restaurants and visitor-serving accommodations) should also be considered in the evaluation of potential odor nuisance impacts. The Project would include a residential development with a pool and recreational room, which is not expected to produce any nuisance odors; therefore, impacts related to odors caused by the Project would be **less than significant**.

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APPENDIX A

CalEEMod Outputs and Estimated Emissions

West Oaks Multi-Family Housing Project

San Diego County APCD Air District, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	2.71	1000sqft	0.06	2,705.00	0
Parking Lot	382.00	Space	3.24	152,800.00	0
City Park	2.93	Acre	2.93	127,630.80	0
Recreational Swimming Pool	1.80	1000sqft	0.04	1,800.00	0
Apartments Mid Rise	192.00	Dwelling Unit	1.63	192,000.00	549

1.2 Other Project Characteristics

Urbanization Urban | **Wind Speed (m/s)** 2.6 | **Precipitation Freq (Days)** 40

Climate Zone 13 | **Operational Year** 2022

Utility Company San Diego Gas & Electric

CO2 Intensity (lb/MWhr) 448.3 | **CH4 Intensity (lb/MWhr)** 0.018 | **N2O Intensity (lb/MWhr)** 0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - GHG intensity based on SDG&E energy mix.

Land Use - Based on site plan.

Construction Phase - See Section 7.2.1 for Construction Details.

Off-road Equipment - See Section 2.6.2 for Construction Details.

Off-road Equipment - See Section 7.2.1 for Construction Details.

Off-road Equipment - See Section 7.2.1 for Construction Details.

Off-road Equipment - See Section 7.2.1 for Construction Details.

Off-road Equipment - See Section 7.2.1 for Construction Details.

Off-road Equipment - See Section 7.2.1 for Construction Details.

Off-road Equipment - See Section 7.2.1 for Construction Details.

Trips and VMT - CalEEMod defaults.

On-road Fugitive Dust - CalEEMod defaults.

Demolition - No demolition of structures anticipated for this project.

Grading - See Section 7.2.1 for Construction Details.

Architectural Coating - Applicant specified low-VOC, 5 g/L for interior and 50 g/L for exterior. The paving VOC is in accordance with SDAPCD Rule 67.0.1.

Vehicle Trips - Based on the Traffic Impact Analysis.

Vehicle Emission Factors - CalEEMod defaults.

Vehicle Emission Factors - CalEEMod defaults.

Vehicle Emission Factors - CalEEMod defaults.

Road Dust - CalEEMod defaults.

Woodstoves - There are no wood or natural gas burning stoves or fireplaces.

Consumer Products - CalEEMod defaults.

Area Coating - Applicant specified low-VOC, 5 g/L for interior and 50 g/L for exterior. The paving VOC is in accordance with SDAPCD Rule 67.0.1.

Landscape Equipment - CalEEMod defaults.

Energy Use - Includes electric water heaters and HVAC.

Water And Wastewater - CalEEMod defaults.

Solid Waste - CalEEMod defaults.

Land Use Change - This was calculated outside of CalEEMod.

Sequestration - This was calculated outside of CalEEMod.

Construction Off-road Equipment Mitigation - Fugitive dust mitigation in accordance with SDAPCD Rule 55.

Mobile Land Use Mitigation - Increased density, accessibility, transit accessbility, and below market rate units.

Mobile Commute Mitigation - No commute mitigation.

Area Mitigation - It was conservatively assumed 5 g/L for interior and 50 g/L for exterior.

Energy Mitigation - LED or other efficient lighting in 75% of the luminaires and Energy Star appliances.

Water Mitigation - Low flow fixtures and water-use efficient irrigation.

Waste Mitigation - In accordance with AB 341.

Operational Off-Road Equipment -

Fleet Mix -

Stationary Sources - Emergency Generators and Fire Pumps - This does not apply to this project.

Stationary Sources - Process Boilers - Does not apply to this project.

Stationary Sources - User Defined - Does not apply to this project.

Stationary Sources - Emergency Generators and Fire Pumps EF - This does not apply to this project.

Stationary Sources - Process Boilers EF - Does not apply to this project.

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	250.00	50.00
tblArchitecturalCoating	EF_Nonresidential_Interior	250.00	5.00
tblArchitecturalCoating	EF_Parking	250.00	100.00
tblArchitecturalCoating	EF_Residential_Exterior	250.00	50.00
tblArchitecturalCoating	EF_Residential_Interior	250.00	5.00
tblAreaCoating	Area_EF_Nonresidential_Exterior	250	50
tblAreaCoating	Area_EF_Nonresidential_Interior	250	5
tblAreaCoating	Area_EF_Parking	250	100
tblAreaCoating	Area_EF_Residential_Exterior	250	50
tblAreaCoating	Area_EF_Residential_Interior	250	5
tblAreaMitigation	UseLowVOCPaintNonresidentialInteriorValue	50	5
tblAreaMitigation	UseLowVOCPaintParkingCheck	False	True

tblAreaMitigation	UseLowVOCPaintResidentialExteriorValue	5	50
tblEnergyUse	LightingElect	741.44	0.00
tblEnergyUse	LightingElect	3.81	0.00
tblEnergyUse	NT24E	3,054.10	0.00
tblEnergyUse	NT24E	4.97	0.00
tblEnergyUse	NT24NG	4,180.00	0.00
tblEnergyUse	NT24NG	4.20	0.00
tblEnergyUse	T24E	209.39	7,389.69
tblEnergyUse	T24E	4.66	18.02
tblEnergyUse	T24NG	3,248.74	1,494.92
tblEnergyUse	T24NG	15.99	6.11
tblFireplaces	FireplaceDayYear	82.00	0.00
tblFireplaces	FireplaceHourDay	3.00	0.00
tblFireplaces	FireplaceWoodMass	3,078.40	0.00
tblFireplaces	NumberGas	105.60	0.00
tblFireplaces	NumberNoFireplace	19.20	0.00
tblFireplaces	NumberWood	67.20	0.00
tblLandUse	LandUseSquareFeet	2,710.00	2,705.00
tblLandUse	LotAcreage	3.44	3.24
tblLandUse	LotAcreage	5.05	1.63
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00

tblOffRoadEquipment	UsageHours	7.00	8.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.018
tblProjectCharacteristics	CO2IntensityFactor	720.49	448.3
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.004
tblTripsAndVMT	VendorTripNumber	67.00	46.00
tblTripsAndVMT	VendorTripNumber	0.00	4.00
tblTripsAndVMT	WorkerTripNumber	258.00	204.00
tblTripsAndVMT	WorkerTripNumber	30.00	16.00
tblTripsAndVMT	WorkerTripNumber	52.00	42.00
tblVehicleTrips	ST_TR	6.39	6.00
tblVehicleTrips	ST_TR	22.75	0.00
tblVehicleTrips	ST_TR	2.46	0.00
tblVehicleTrips	ST_TR	9.10	0.00
tblVehicleTrips	SU_TR	5.86	6.00
tblVehicleTrips	SU_TR	16.74	0.00
tblVehicleTrips	SU_TR	1.05	0.00
tblVehicleTrips	SU_TR	13.60	0.00
tblVehicleTrips	WD_TR	6.65	6.00
tblVehicleTrips	WD_TR	1.89	0.00
tblVehicleTrips	WD_TR	11.03	0.00
tblVehicleTrips	WD_TR	33.82	0.00
tblWoodstoves	NumberCatalytic	9.60	0.00
tblWoodstoves	NumberNoncatalytic	9.60	0.00
tblWoodstoves	WoodstoveDayYear	82.00	0.00
tblWoodstoves	WoodstoveWoodMass	3,019.20	0.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.6275	3.5968	3.3310	7.4100e-003	0.4229	0.1609	0.5838	0.1581	0.1501	0.3082	0.0000	662.4231	662.4231	0.1198	0.0000	665.4182
Maximum	**0.6275**	**3.5968**	**3.3310**	**7.4100e-003**	**0.4229**	**0.1609**	**0.5838**	**0.1581**	**0.1501**	**0.3082**	**0.0000**	**662.4231**	**662.4231**	**0.1198**	**0.0000**	**665.4182**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.6275	3.5968	3.3310	7.4100e-003	0.3017	0.1609	0.4626	0.1011	0.1501	0.2512	0.0000	662.4226	662.4226	0.1198	0.0000	665.4177
Maximum	**0.6275**	**3.5968**	**3.3310**	**7.4100e-003**	**0.3017**	**0.1609**	**0.4626**	**0.1011**	**0.1501**	**0.2512**	**0.0000**	**662.4226**	**662.4226**	**0.1198**	**0.0000**	**665.4177**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**28.67**	**0.00**	**20.77**	**36.04**	**0.00**	**18.49**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
4	10-27-2020	1-26-2021	0.4399	0.4399
5	1-27-2021	4-26-2021	1.0261	1.0261
6	4-27-2021	7-26-2021	0.8697	0.8697
7	7-27-2021	9-30-2021	0.6308	0.6308
		Highest	1.0261	1.0261

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.8440	0.0165	1.4307	8.0000e-005		7.9000e-003	7.9000e-003		7.9000e-003	7.9000e-003	0.0000	2.3357	2.3357	2.2600e-003	0.0000	2.3923
Energy	1.6400e-003	0.0140	6.3100e-003	9.0000e-005		1.1300e-003	1.1300e-003		1.1300e-003	1.1300e-003	0.0000	325.4962	325.4962	0.0127	3.0600e-003	326.7253
Mobile	0.3285	1.4698	3.9684	0.0140	1.2396	0.0117	1.2513	0.3319	0.0109	0.3429	0.0000	1,290.8322	1,290.8322	0.0670	0.0000	1,292.5071
Waste						0.0000	0.0000		0.0000	0.0000	20.5731	0.0000	20.5731	1.2158	0.0000	50.9691
Water						0.0000	0.0000		0.0000	0.0000	4.1553	61.1976	65.3529	0.4293	0.0106	79.2498
Total	**1.1741**	**1.5003**	**5.4055**	**0.0142**	**1.2396**	**0.0207**	**1.2603**	**0.3319**	**0.0200**	**0.3519**	**24.7284**	**1,679.8617**	**1,704.5901**	**1.7271**	**0.0137**	**1,751.8436**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.8440	0.0165	1.4307	8.0000e-005		7.9000e-003	7.9000e-003		7.9000e-003	7.9000e-003	0.0000	2.3357	2.3357	2.2600e-003	0.0000	2.3923
Energy	1.6400e-003	0.0140	6.3100e-003	9.0000e-005		1.1300e-003	1.1300e-003		1.1300e-003	1.1300e-003	0.0000	323.1690	323.1690	0.0126	3.0400e-003	324.3896
Mobile	0.2872	1.2198	3.0725	0.0101	0.8781	8.6500e-003	0.8867	0.2351	8.0700e-003	0.2432	0.0000	936.4238	936.4238	0.0513	0.0000	937.7058
Waste						0.0000	0.0000		0.0000	0.0000	10.2866	0.0000	10.2866	0.6079	0.0000	25.4845
Water						0.0000	0.0000		0.0000	0.0000	3.3242	52.6441	55.9683	0.3435	8.5300e-003	67.0994
Total	**1.1328**	**1.2503**	**4.5096**	**0.0103**	**0.8781**	**0.0177**	**0.8958**	**0.2351**	**0.0171**	**0.2522**	**13.6108**	**1,314.5725**	**1,328.1833**	**1.0176**	**0.0116**	**1,357.0716**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**3.51**	**16.66**	**16.57**	**27.19**	**29.16**	**14.67**	**28.93**	**29.16**	**14.29**	**28.32**	**44.96**	**21.75**	**22.08**	**41.08**	**15.42**	**22.53**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	1/1/2021	1/14/2021	5	10	
2	Grading	Grading	1/15/2021	2/25/2021	5	30	
3	Trenching	Trenching	2/26/2021	3/11/2021	5	10	
4	Building Construction	Building Construction	3/12/2021	12/16/2021	5	200	
5	Paving	Paving	11/15/2021	12/10/2021	5	20	
6	Architectural Coating	Architectural Coating	11/22/2021	12/17/2021	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 75

Acres of Paving: 3.24

Residential Indoor: 388,800; Residential Outdoor: 129,600; Non-Residential Indoor: 6,758; Non-Residential Outdoor: 2,253; Striped Parking Area: 9,168 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Trenching	Excavators	1	8.00	158	0.38
Trenching	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Trenching	Trenchers	1	8.00	78	0.50
Building Construction	Cranes	1	8.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	3	8.00	130	0.42
Paving	Paving Equipment	3	8.00	132	0.36
Paving	Rollers	3	8.00	80	0.38
Paving	Signal Boards	1	8.00	6	0.82
Paving	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Architectural Coating	Air Compressors	1	8.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Trenching	3	8.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	204.00	46.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	12	16.00	4.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	42.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Site Preparation - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0903	0.0000	0.0903	0.0497	0.0000	0.0497	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0194	0.2025	0.1058	1.9000e-004		0.0102	0.0102		9.4000e-003	9.4000e-003	0.0000	16.7179	16.7179	5.4100e-003	0.0000	16.8530
Total	**0.0194**	**0.2025**	**0.1058**	**1.9000e-004**	**0.0903**	**0.0102**	**0.1006**	**0.0497**	**9.4000e-003**	**0.0591**	**0.0000**	**16.7179**	**16.7179**	**5.4100e-003**	**0.0000**	**16.8530**

3.2 Site Preparation - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.1000e-004	2.2000e-004	2.2500e-003	1.0000e-005	7.2000e-004	1.0000e-005	7.3000e-004	1.9000e-004	0.0000	2.0000e-004	0.0000	0.6305	0.6305	2.0000e-005	0.0000	0.6309
Total	**3.1000e-004**	**2.2000e-004**	**2.2500e-003**	**1.0000e-005**	**7.2000e-004**	**1.0000e-005**	**7.3000e-004**	**1.9000e-004**	**0.0000**	**2.0000e-004**	**0.0000**	**0.6305**	**0.6305**	**2.0000e-005**	**0.0000**	**0.6309**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0407	0.0000	0.0407	0.0223	0.0000	0.0223	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0194	0.2025	0.1058	1.9000e-004		0.0102	0.0102		9.4000e-003	9.4000e-003	0.0000	16.7178	16.7178	5.4100e-003	0.0000	16.8530
Total	**0.0194**	**0.2025**	**0.1058**	**1.9000e-004**	**0.0407**	**0.0102**	**0.0509**	**0.0223**	**9.4000e-003**	**0.0317**	**0.0000**	**16.7178**	**16.7178**	**5.4100e-003**	**0.0000**	**16.8530**

3.2 Site Preparation - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.1000e-004	2.2000e-004	2.2500e-003	1.0000e-005	7.2000e-004	1.0000e-005	7.3000e-004	1.9000e-004	0.0000	2.0000e-004	0.0000	0.6305	0.6305	2.0000e-005	0.0000	0.6309
Total	**3.1000e-004**	**2.2000e-004**	**2.2500e-003**	**1.0000e-005**	**7.2000e-004**	**1.0000e-005**	**7.3000e-004**	**1.9000e-004**	**0.0000**	**2.0000e-004**	**0.0000**	**0.6305**	**0.6305**	**2.0000e-005**	**0.0000**	**0.6309**

3.3 Grading - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1301	0.0000	0.1301	0.0540	0.0000	0.0540	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0629	0.6960	0.4632	9.3000e-004		0.0298	0.0298		0.0274	0.0274	0.0000	81.7425	81.7425	0.0264	0.0000	82.4034
Total	**0.0629**	**0.6960**	**0.4632**	**9.3000e-004**	**0.1301**	**0.0298**	**0.1599**	**0.0540**	**0.0274**	**0.0814**	**0.0000**	**81.7425**	**81.7425**	**0.0264**	**0.0000**	**82.4034**

3.3 Grading - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0400e-003	7.4000e-004	7.4900e-003	2.0000e-005	2.4100e-003	2.0000e-005	2.4200e-003	6.4000e-004	2.0000e-005	6.5000e-004	0.0000	2.1016	2.1016	6.0000e-005	0.0000	2.1031
Total	**1.0400e-003**	**7.4000e-004**	**7.4900e-003**	**2.0000e-005**	**2.4100e-003**	**2.0000e-005**	**2.4200e-003**	**6.4000e-004**	**2.0000e-005**	**6.5000e-004**	**0.0000**	**2.1016**	**2.1016**	**6.0000e-005**	**0.0000**	**2.1031**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0586	0.0000	0.0586	0.0243	0.0000	0.0243	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0629	0.6960	0.4632	9.3000e-004		0.0298	0.0298		0.0274	0.0274	0.0000	81.7424	81.7424	0.0264	0.0000	82.4033
Total	**0.0629**	**0.6960**	**0.4632**	**9.3000e-004**	**0.0586**	**0.0298**	**0.0883**	**0.0243**	**0.0274**	**0.0517**	**0.0000**	**81.7424**	**81.7424**	**0.0264**	**0.0000**	**82.4033**

3.3 Grading - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0400e-003	7.4000e-004	7.4900e-003	2.0000e-005	2.4100e-003	2.0000e-005	2.4200e-003	6.4000e-004	2.0000e-005	6.5000e-004	0.0000	2.1016	2.1016	6.0000e-005	0.0000	2.1031
Total	**1.0400e-003**	**7.4000e-004**	**7.4900e-003**	**2.0000e-005**	**2.4100e-003**	**2.0000e-005**	**2.4200e-003**	**6.4000e-004**	**2.0000e-005**	**6.5000e-004**	**0.0000**	**2.1016**	**2.1016**	**6.0000e-005**	**0.0000**	**2.1031**

3.4 Trenching - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.9900e-003	0.0378	0.0407	6.0000e-005		2.3600e-003	2.3600e-003		2.1700e-003	2.1700e-003	0.0000	5.1166	5.1166	1.6500e-003	0.0000	5.1580
Total	**3.9900e-003**	**0.0378**	**0.0407**	**6.0000e-005**		**2.3600e-003**	**2.3600e-003**		**2.1700e-003**	**2.1700e-003**	**0.0000**	**5.1166**	**5.1166**	**1.6500e-003**	**0.0000**	**5.1580**

3.4 Trenching - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4000e-004	1.0000e-004	1.0000e-003	0.0000	3.2000e-004	0.0000	3.2000e-004	9.0000e-005	0.0000	9.0000e-005	0.0000	0.2802	0.2802	1.0000e-005	0.0000	0.2804
Total	**1.4000e-004**	**1.0000e-004**	**1.0000e-003**	**0.0000**	**3.2000e-004**	**0.0000**	**3.2000e-004**	**9.0000e-005**	**0.0000**	**9.0000e-005**	**0.0000**	**0.2802**	**0.2802**	**1.0000e-005**	**0.0000**	**0.2804**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.9900e-003	0.0378	0.0407	6.0000e-005		2.3600e-003	2.3600e-003		2.1700e-003	2.1700e-003	0.0000	5.1166	5.1166	1.6500e-003	0.0000	5.1580
Total	**3.9900e-003**	**0.0378**	**0.0407**	**6.0000e-005**		**2.3600e-003**	**2.3600e-003**		**2.1700e-003**	**2.1700e-003**	**0.0000**	**5.1166**	**5.1166**	**1.6500e-003**	**0.0000**	**5.1580**

3.4 Trenching - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4000e-004	1.0000e-004	1.0000e-003	0.0000	3.2000e-004	0.0000	3.2000e-004	9.0000e-005	0.0000	9.0000e-005	0.0000	0.2802	0.2802	1.0000e-005	0.0000	0.2804
Total	**1.4000e-004**	**1.0000e-004**	**1.0000e-003**	**0.0000**	**3.2000e-004**	**0.0000**	**3.2000e-004**	**9.0000e-005**	**0.0000**	**9.0000e-005**	**0.0000**	**0.2802**	**0.2802**	**1.0000e-005**	**0.0000**	**0.2804**

3.5 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2023	1.8749	1.7671	2.8800e-003		0.1025	0.1025		0.0963	0.0963	0.0000	248.2097	248.2097	0.0612	0.0000	249.7408
Total	**0.2023**	**1.8749**	**1.7671**	**2.8800e-003**		**0.1025**	**0.1025**		**0.0963**	**0.0963**	**0.0000**	**248.2097**	**248.2097**	**0.0612**	**0.0000**	**249.7408**

3.5 Building Construction - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0142	0.4727	0.1261	1.2300e-003	0.0305	1.0000e-003	0.0315	8.8200e-003	9.6000e-004	9.7700e-003	0.0000	120.2624	120.2624	8.9300e-003	0.0000	120.4856
Worker	0.0709	0.0506	0.5097	1.5800e-003	0.1636	1.1600e-003	0.1648	0.0435	1.0700e-003	0.0445	0.0000	142.9066	142.9066	4.1000e-003	0.0000	143.0090
Total	**0.0851**	**0.5233**	**0.6357**	**2.8100e-003**	**0.1941**	**2.1600e-003**	**0.1963**	**0.0523**	**2.0300e-003**	**0.0543**	**0.0000**	**263.1690**	**263.1690**	**0.0130**	**0.0000**	**263.4946**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.2023	1.8749	1.7671	2.8800e-003		0.1025	0.1025		0.0963	0.0963	0.0000	248.2094	248.2094	0.0612	0.0000	249.7405
Total	**0.2023**	**1.8749**	**1.7671**	**2.8800e-003**		**0.1025**	**0.1025**		**0.0963**	**0.0963**	**0.0000**	**248.2094**	**248.2094**	**0.0612**	**0.0000**	**249.7405**

3.5 Building Construction - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0142	0.4727	0.1261	1.2300e-003	0.0305	1.0000e-003	0.0315	8.8200e-003	9.6000e-004	9.7700e-003	0.0000	120.2624	120.2624	8.9300e-003	0.0000	120.4856
Worker	0.0709	0.0506	0.5097	1.5800e-003	0.1636	1.1600e-003	0.1648	0.0435	1.0700e-003	0.0445	0.0000	142.9066	142.9066	4.1000e-003	0.0000	143.0090
Total	**0.0851**	**0.5233**	**0.6357**	**2.8100e-003**	**0.1941**	**2.1600e-003**	**0.1963**	**0.0523**	**2.0300e-003**	**0.0543**	**0.0000**	**263.1690**	**263.1690**	**0.0130**	**0.0000**	**263.4946**

3.6 Paving - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0232	0.2353	0.2680	4.1000e-004		0.0125	0.0125		0.0116	0.0116	0.0000	35.9420	35.9420	0.0115	0.0000	36.2302
Paving	4.2400e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0274**	**0.2353**	**0.2680**	**4.1000e-004**		**0.0125**	**0.0125**		**0.0116**	**0.0116**	**0.0000**	**35.9420**	**35.9420**	**0.0115**	**0.0000**	**36.2302**

3.6 Paving - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.2000e-004	4.1100e-003	1.1000e-003	1.0000e-005	2.7000e-004	1.0000e-005	2.7000e-004	8.0000e-005	1.0000e-005	8.0000e-005	0.0000	1.0458	1.0458	8.0000e-005	0.0000	1.0477
Worker	5.6000e-004	4.0000e-004	4.0000e-003	1.0000e-005	1.2800e-003	1.0000e-005	1.2900e-003	3.4000e-004	1.0000e-005	3.5000e-004	0.0000	1.1208	1.1208	3.0000e-005	0.0000	1.1216
Total	**6.8000e-004**	**4.5100e-003**	**5.1000e-003**	**2.0000e-005**	**1.5500e-003**	**2.0000e-005**	**1.5600e-003**	**4.2000e-004**	**2.0000e-005**	**4.3000e-004**	**0.0000**	**2.1666**	**2.1666**	**1.1000e-004**	**0.0000**	**2.1693**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0232	0.2353	0.2680	4.1000e-004		0.0125	0.0125		0.0116	0.0116	0.0000	35.9420	35.9420	0.0115	0.0000	36.2301
Paving	4.2400e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0274**	**0.2353**	**0.2680**	**4.1000e-004**		**0.0125**	**0.0125**		**0.0116**	**0.0116**	**0.0000**	**35.9420**	**35.9420**	**0.0115**	**0.0000**	**36.2301**

3.6 Paving - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.2000e-004	4.1100e-003	1.1000e-003	1.0000e-005	2.7000e-004	1.0000e-005	2.7000e-004	8.0000e-005	1.0000e-005	8.0000e-005	0.0000	1.0458	1.0458	8.0000e-005	0.0000	1.0477
Worker	5.6000e-004	4.0000e-004	4.0000e-003	1.0000e-005	1.2800e-003	1.0000e-005	1.2900e-003	3.4000e-004	1.0000e-005	3.5000e-004	0.0000	1.1208	1.1208	3.0000e-005	0.0000	1.1216
Total	**6.8000e-004**	**4.5100e-003**	**5.1000e-003**	**2.0000e-005**	**1.5500e-003**	**2.0000e-005**	**1.5600e-003**	**4.2000e-004**	**2.0000e-005**	**4.3000e-004**	**0.0000**	**2.1666**	**2.1666**	**1.1000e-004**	**0.0000**	**2.1693**

3.7 Architectural Coating - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.2199					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.9200e-003	0.0204	0.0242	4.0000e-005		1.2500e-003	1.2500e-003		1.2500e-003	1.2500e-003	0.0000	3.4043	3.4043	2.3000e-004	0.0000	3.4102
Total	**0.2228**	**0.0204**	**0.0242**	**4.0000e-005**		**1.2500e-003**	**1.2500e-003**		**1.2500e-003**	**1.2500e-003**	**0.0000**	**3.4043**	**3.4043**	**2.3000e-004**	**0.0000**	**3.4102**

3.7 Architectural Coating - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4600e-003	1.0400e-003	0.0105	3.0000e-005	3.3700e-003	2.0000e-005	3.3900e-003	8.9000e-004	2.0000e-005	9.2000e-004	0.0000	2.9422	2.9422	8.0000e-005	0.0000	2.9443
Total	**1.4600e-003**	**1.0400e-003**	**0.0105**	**3.0000e-005**	**3.3700e-003**	**2.0000e-005**	**3.3900e-003**	**8.9000e-004**	**2.0000e-005**	**9.2000e-004**	**0.0000**	**2.9422**	**2.9422**	**8.0000e-005**	**0.0000**	**2.9443**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.2199					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.9200e-003	0.0204	0.0242	4.0000e-005		1.2500e-003	1.2500e-003		1.2500e-003	1.2500e-003	0.0000	3.4043	3.4043	2.3000e-004	0.0000	3.4102
Total	**0.2228**	**0.0204**	**0.0242**	**4.0000e-005**		**1.2500e-003**	**1.2500e-003**		**1.2500e-003**	**1.2500e-003**	**0.0000**	**3.4043**	**3.4043**	**2.3000e-004**	**0.0000**	**3.4102**

3.7 Architectural Coating - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.4600e-003	1.0400e-003	0.0105	3.0000e-005	3.3700e-003	2.0000e-005	3.3900e-003	8.9000e-004	2.0000e-005	9.2000e-004	0.0000	2.9422	2.9422	8.0000e-005	0.0000	2.9443
Total	**1.4600e-003**	**1.0400e-003**	**0.0105**	**3.0000e-005**	**3.3700e-003**	**2.0000e-005**	**3.3900e-003**	**8.9000e-004**	**2.0000e-005**	**9.2000e-004**	**0.0000**	**2.9422**	**2.9422**	**8.0000e-005**	**0.0000**	**2.9443**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Increase Density

Improve Destination Accessibility

Increase Transit Accessibility

Integrate Below Market Rate Housing

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.2872	1.2198	3.0725	0.0101	0.8781	8.6500e-003	0.8867	0.2351	8.0700e-003	0.2432	0.0000	936.4238	936.4238	0.0513	0.0000	937.7058
Unmitigated	0.3285	1.4698	3.9684	0.0140	1.2396	0.0117	1.2513	0.3319	0.0109	0.3429	0.0000	1,290.8322	1,290.8322	0.0670	0.0000	1,292.5071

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Mid Rise	1,152.00	1,152.00	1152.00	3,289,309	2,330,010
City Park	0.00	0.00	0.00		
General Office Building	0.00	0.00	0.00		
Parking Lot	0.00	0.00	0.00		
Recreational Swimming Pool	0.00	0.00	0.00		
Total	1,152.00	1,152.00	1,152.00	3,289,309	2,330,010

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Mid Rise	10.80	7.30	7.50	41.60	18.80	39.60	86	11	3
City Park	9.50	7.30	7.30	33.00	48.00	19.00	66	28	6
General Office Building	9.50	7.30	7.30	33.00	48.00	19.00	77	19	4
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Recreational Swimming Pool	9.50	7.30	7.30	33.00	48.00	19.00	52	39	9

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Mid Rise	0.598645	0.040929	0.181073	0.106149	0.015683	0.005479	0.016317	0.023976	0.001926	0.001932	0.006016	0.000753	0.001122
City Park	0.598645	0.040929	0.181073	0.106149	0.015683	0.005479	0.016317	0.023976	0.001926	0.001932	0.006016	0.000753	0.001122
General Office Building	0.598645	0.040929	0.181073	0.106149	0.015683	0.005479	0.016317	0.023976	0.001926	0.001932	0.006016	0.000753	0.001122
Parking Lot	0.598645	0.040929	0.181073	0.106149	0.015683	0.005479	0.016317	0.023976	0.001926	0.001932	0.006016	0.000753	0.001122
Recreational Swimming Pool	0.598645	0.040929	0.181073	0.106149	0.015683	0.005479	0.016317	0.023976	0.001926	0.001932	0.006016	0.000753	0.001122

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Install High Efficiency Lighting

Install Energy Efficient Appliances

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	306.9703	306.9703	0.0123	2.7400e-003	308.0946
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	309.2975	309.2975	0.0124	2.7600e-003	310.4304
NaturalGas Mitigated	1.6400e-003	0.0140	6.3100e-003	9.0000e-005		1.1300e-003	1.1300e-003		1.1300e-003	1.1300e-003	0.0000	16.1987	16.1987	3.1000e-004	3.0000e-004	16.2950
NaturalGas Unmitigated	1.6400e-003	0.0140	6.3100e-003	9.0000e-005		1.1300e-003	1.1300e-003		1.1300e-003	1.1300e-003	0.0000	16.1987	16.1987	3.1000e-004	3.0000e-004	16.2950

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Mid Rise	287025	1.5500e-003	0.0132	5.6300e-003	8.0000e-005		1.0700e-003	1.0700e-003		1.0700e-003	1.0700e-003	0.0000	15.3167	15.3167	2.9000e-004	2.8000e-004	15.4078
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
General Office Building	16527.5	9.0000e-005	8.1000e-004	6.8000e-004	0.0000		6.0000e-005	6.0000e-005		6.0000e-005	6.0000e-005	0.0000	0.8820	0.8820	2.0000e-005	2.0000e-005	0.8872
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**1.6400e-003**	**0.0140**	**6.3100e-003**	**8.0000e-005**		**1.1300e-003**	**1.1300e-003**		**1.1300e-003**	**1.1300e-003**	**0.0000**	**16.1987**	**16.1987**	**3.1000e-004**	**3.0000e-004**	**16.2950**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
Apartments Mid Rise	287025	1.5500e-003	0.0132	5.6300e-003	8.0000e-005		1.0700e-003	1.0700e-003		1.0700e-003	1.0700e-003	0.0000	15.3167	15.3167	2.9000e-004	2.8000e-004	15.4078
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
General Office Building	16527.5	9.0000e-005	8.1000e-004	6.8000e-004	0.0000		6.0000e-005	6.0000e-005		6.0000e-005	6.0000e-005	0.0000	0.8820	0.8820	2.0000e-005	2.0000e-005	0.8872
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**1.6400e-003**	**0.0140**	**6.3100e-003**	**8.0000e-005**		**1.1300e-003**	**1.1300e-003**		**1.1300e-003**	**1.1300e-003**	**0.0000**	**16.1987**	**16.1987**	**3.1000e-004**	**3.0000e-004**	**16.2950**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	1.41882e +006	288.5107	0.0116	2.5700e-003	289.5674
City Park	0	0.0000	0.0000	0.0000	0.0000
General Office Building	48744.1	9.9119	4.0000e-004	9.0000e-005	9.9482
Parking Lot	53480	10.8749	4.4000e-004	1.0000e-004	10.9148
Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000
Total		**309.2975**	**0.0124**	**2.7600e-003**	**310.4304**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
Apartments Mid Rise	1.41882e+006	288.5107	0.0116	2.5700e-003	289.5674
City Park	0	0.0000	0.0000	0.0000	0.0000
General Office Building	48744.1	9.9119	4.0000e-004	9.0000e-005	9.9482
Parking Lot	42035.3	8.5477	3.4000e-004	8.0000e-005	8.5790
Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000
Total		**306.9703**	**0.0123**	**2.7400e-003**	**308.0946**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

No Hearths Installed

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.8440	0.0165	1.4307	8.0000e-005		7.9000e-003	7.9000e-003		7.9000e-003	7.9000e-003	0.0000	2.3357	2.3357	2.2600e-003	0.0000	2.3923
Unmitigated	0.8440	0.0165	1.4307	8.0000e-005		7.9000e-003	7.9000e-003		7.9000e-003	7.9000e-003	0.0000	2.3357	2.3357	2.2600e-003	0.0000	2.3923

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0220					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.7785					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0434	0.0165	1.4307	8.0000e-005		7.9000e-003	7.9000e-003		7.9000e-003	7.9000e-003	0.0000	2.3357	2.3357	2.2600e-003	0.0000	2.3923
Total	**0.8440**	**0.0165**	**1.4307**	**8.0000e-005**		**7.9000e-003**	**7.9000e-003**		**7.9000e-003**	**7.9000e-003**	**0.0000**	**2.3357**	**2.3357**	**2.2600e-003**	**0.0000**	**2.3923**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0220					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.7785					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0434	0.0165	1.4307	8.0000e-005		7.9000e-003	7.9000e-003		7.9000e-003	7.9000e-003	0.0000	2.3357	2.3357	2.2600e-003	0.0000	2.3923
Total	**0.8440**	**0.0165**	**1.4307**	**8.0000e-005**		**7.9000e-003**	**7.9000e-003**		**7.9000e-003**	**7.9000e-003**	**0.0000**	**2.3357**	**2.3357**	**2.2600e-003**	**0.0000**	**2.3923**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	55.9683	0.3435	8.5300e-003	67.0994
Unmitigated	65.3529	0.4293	0.0106	79.2498

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Mid Rise	12.5096 / 7.88647	54.9079	0.4097	0.0101	68.1534
City Park	0 / 3.49104	7.8869	3.2000e-004	7.0000e-005	7.9157
General Office Building	0.481658 / 0.29521	2.0951	0.0158	3.9000e-004	2.6050
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	0.106458 / 0.0652482	0.4631	3.4900e-003	9.0000e-005	0.5758
Total		**65.3529**	**0.4293**	**0.0106**	**79.2498**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
Apartments Mid Rise	10.0077 / 7.4054	46.4029	0.3278	8.0900e-003	57.0083
City Park	0 / 3.27809	7.4058	3.0000e-004	7.0000e-005	7.4329
General Office Building	0.385327 / 0.277202	1.7688	0.0126	3.1000e-004	2.1770
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	0.0851661 / 0.0612681	0.3909	2.7900e-003	7.0000e-005	0.4812
Total		**55.9683**	**0.3436**	**8.5400e-003**	**67.0994**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	10.2866	0.6079	0.0000	25.4845
Unmitigated	20.5731	1.2158	0.0000	50.9691

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	88.32	17.9282	1.0595	0.0000	44.4163
City Park	0.25	0.0508	3.0000e-003	0.0000	0.1257
General Office Building	2.52	0.5115	0.0302	0.0000	1.2673
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	10.26	2.0827	0.1231	0.0000	5.1598
Total		**20.5731**	**1.2158**	**0.0000**	**50.9691**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
Apartments Mid Rise	44.16	8.9641	0.5298	0.0000	22.2081
City Park	0.125	0.0254	1.5000e-003	0.0000	0.0629
General Office Building	1.26	0.2558	0.0151	0.0000	0.6337
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	5.13	1.0413	0.0615	0.0000	2.5799
Total		**10.2866**	**0.6079**	**0.0000**	**25.4845**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

West Oaks Multi-Family Housing Project

San Diego County APCD Air District, Summer

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	2.71	1000sqft	0.06	2,705.00	0
Parking Lot	382.00	Space	3.24	152,800.00	0
City Park	2.93	Acre	2.93	127,630.80	0
Recreational Swimming Pool	1.80	1000sqft	0.04	1,800.00	0
Apartments Mid Rise	192.00	Dwelling Unit	1.63	192,000.00	549

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	13			**Operational Year**	2022
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	448.3	**CH4 Intensity (lb/MWhr)**	0.018	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - GHG intensity based on SDG&E energy mix.

Land Use - Based on site plan.

Construction Phase - See Section 7.2.1 for Construction Details.

Off-road Equipment - See Section 2.6.2 for Construction Details.

Off-road Equipment - See Section 7.2.1 for Construction Details.

Off-road Equipment - See Section 7.2.1 for Construction Details.

Off-road Equipment - See Section 7.2.1 for Construction Details.

Off-road Equipment - See Section 7.2.1 for Construction Details.

Off-road Equipment - See Section 7.2.1 for Construction Details.

Off-road Equipment - See Section 7.2.1 for Construction Details.

Trips and VMT - CalEEMod defaults.

On-road Fugitive Dust - CalEEMod defaults.

Demolition - No demolition of structures anticipated for this project.

Grading - See Section 7.2.1 for Construction Details.

Architectural Coating - Applicant specified low-VOC, 5 g/L for interior and 50 g/L for exterior. The paving VOC is in accordance with SDAPCD Rule 67.0.1.

Vehicle Trips - Based on the Traffic Impact Analysis.

Vehicle Emission Factors - CalEEMod defaults.

Vehicle Emission Factors - CalEEMod defaults.

Vehicle Emission Factors - CalEEMod defaults.

Road Dust - CalEEMod defaults.

Woodstoves - There are no wood or natural gas burning stoves or fireplaces.

Consumer Products - CalEEMod defaults.

Area Coating - Applicant specified low-VOC, 5 g/L for interior and 50 g/L for exterior. The paving VOC is in accordance with SDAPCD Rule 67.0.1.

Landscape Equipment - CalEEMod defaults.

Energy Use - Includes electric water heaters and HVAC.

Water And Wastewater - CalEEMod defaults.

Solid Waste - CalEEMod defaults.

Land Use Change - This was calculated outside of CalEEMod.

Sequestration - This was calculated outside of CalEEMod.

Construction Off-road Equipment Mitigation - Fugitive dust mitigation in accordance with SDAPCD Rule 55.

Mobile Land Use Mitigation - Increased density, accessibility, transit accessbility, and below market rate units.

Mobile Commute Mitigation - No commute mitigation.

Area Mitigation - It was conservatively assumed 5 g/L for interior and 50 g/L for exterior.

Energy Mitigation - LED or other efficient lighting in 75% of the luminaires and Energy Star appliances.

Water Mitigation - Low flow fixtures and water-use efficient irrigation.

Waste Mitigation - In accordance with AB 341.

Operational Off-Road Equipment -

Fleet Mix -

Stationary Sources - Emergency Generators and Fire Pumps - This does not apply to this project.

Stationary Sources - Process Boilers - Does not apply to this project.

Stationary Sources - User Defined - Does not apply to this project.

Stationary Sources - Emergency Generators and Fire Pumps EF - This does not apply to this project.

Stationary Sources - Process Boilers EF - Does not apply to this project.

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	250.00	50.00
tblArchitecturalCoating	EF_Nonresidential_Interior	250.00	5.00
tblArchitecturalCoating	EF_Parking	250.00	100.00
tblArchitecturalCoating	EF_Residential_Exterior	250.00	50.00
tblArchitecturalCoating	EF_Residential_Interior	250.00	5.00
tblAreaCoating	Area_EF_Nonresidential_Exterior	250	50
tblAreaCoating	Area_EF_Nonresidential_Interior	250	5
tblAreaCoating	Area_EF_Parking	250	100
tblAreaCoating	Area_EF_Residential_Exterior	250	50
tblAreaCoating	Area_EF_Residential_Interior	250	5
tblAreaMitigation	UseLowVOCPaintNonresidentialInteriorValue	50	5
tblAreaMitigation	UseLowVOCPaintParkingCheck	False	True

tblAreaMitigation	UseLowVOCPaintResidentialExteriorValue	5	50
tblEnergyUse	LightingElect	741.44	0.00
tblEnergyUse	LightingElect	3.81	0.00
tblEnergyUse	NT24E	3,054.10	0.00
tblEnergyUse	NT24E	4.97	0.00
tblEnergyUse	NT24NG	4,180.00	0.00
tblEnergyUse	NT24NG	4.20	0.00
tblEnergyUse	T24E	209.39	7,389.69
tblEnergyUse	T24E	4.66	18.02
tblEnergyUse	T24NG	3,248.74	1,494.92
tblEnergyUse	T24NG	15.99	6.11
tblFireplaces	FireplaceDayYear	82.00	0.00
tblFireplaces	FireplaceHourDay	3.00	0.00
tblFireplaces	FireplaceWoodMass	3,078.40	0.00
tblFireplaces	NumberGas	105.60	0.00
tblFireplaces	NumberNoFireplace	19.20	0.00
tblFireplaces	NumberWood	67.20	0.00
tblLandUse	LandUseSquareFeet	2,710.00	2,705.00
tblLandUse	LotAcreage	3.44	3.24
tblLandUse	LotAcreage	5.05	1.63
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00

tblOffRoadEquipment	UsageHours	7.00	8.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.018
tblProjectCharacteristics	CO2IntensityFactor	720.49	448.3
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.004
tblTripsAndVMT	VendorTripNumber	67.00	46.00
tblTripsAndVMT	VendorTripNumber	0.00	4.00
tblTripsAndVMT	WorkerTripNumber	258.00	204.00
tblTripsAndVMT	WorkerTripNumber	30.00	16.00
tblTripsAndVMT	WorkerTripNumber	52.00	42.00
tblVehicleTrips	ST_TR	6.39	6.00
tblVehicleTrips	ST_TR	22.75	0.00
tblVehicleTrips	ST_TR	2.46	0.00
tblVehicleTrips	ST_TR	9.10	0.00
tblVehicleTrips	SU_TR	5.86	6.00
tblVehicleTrips	SU_TR	16.74	0.00
tblVehicleTrips	SU_TR	1.05	0.00
tblVehicleTrips	SU_TR	13.60	0.00
tblVehicleTrips	WD_TR	6.65	6.00
tblVehicleTrips	WD_TR	1.89	0.00
tblVehicleTrips	WD_TR	11.03	0.00
tblVehicleTrips	WD_TR	33.82	0.00
tblWoodstoves	NumberCatalytic	9.60	0.00
tblWoodstoves	NumberNoncatalytic	9.60	0.00
tblWoodstoves	WoodstoveDayYear	82.00	0.00
tblWoodstoves	WoodstoveWoodMass	3,019.20	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	28.0984	49.9949	55.1421	0.1088	18.2141	2.4303	20.2596	9.9699	2.2668	11.8517	0.0000	10,663.8327	10,663.8327	2.1364	0.0000	10,717.2421
Maximum	**28.0984**	**49.9949**	**55.1421**	**0.1088**	**18.2141**	**2.4303**	**20.2596**	**9.9699**	**2.2668**	**11.8517**	**0.0000**	**10,663.8327**	**10,663.8327**	**2.1364**	**0.0000**	**10,717.2421**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	28.0984	49.9949	55.1421	0.1088	8.2777	2.4303	10.3232	4.5080	2.2668	6.3899	0.0000	10,663.8327	10,663.8327	2.1364	0.0000	10,717.2421
Maximum	**28.0984**	**49.9949**	**55.1421**	**0.1088**	**8.2777**	**2.4303**	**10.3232**	**4.5080**	**2.2668**	**6.3899**	**0.0000**	**10,663.8327**	**10,663.8327**	**2.1364**	**0.0000**	**10,717.2421**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**54.55**	**0.00**	**49.05**	**54.78**	**0.00**	**46.08**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	4.8690	0.1832	15.8971	8.4000e-004		0.0878	0.0878		0.0878	0.0878	0.0000	28.6073	28.6073	0.0277	0.0000	29.3008
Energy	8.9700e-003	0.0769	0.0346	4.9000e-004		6.2000e-003	6.2000e-003		6.2000e-003	6.2000e-003		97.8412	97.8412	1.8800e-003	1.7900e-003	98.4226
Mobile	1.9058	7.8334	22.4881	0.0803	6.9746	0.0641	7.0387	1.8640	0.0599	1.9239		8,164.5794	8,164.5794	0.4086		8,174.7943
Total	**6.7838**	**8.0936**	**38.4198**	**0.0816**	**6.9746**	**0.1581**	**7.1326**	**1.8640**	**0.1538**	**2.0179**	**0.0000**	**8,291.0279**	**8,291.0279**	**0.4382**	**1.7900e-003**	**8,302.5177**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	4.8690	0.1832	15.8971	8.4000e-004		0.0878	0.0878		0.0878	0.0878	0.0000	28.6073	28.6073	0.0277	0.0000	29.3008
Energy	8.9700e-003	0.0769	0.0346	4.9000e-004		6.2000e-003	6.2000e-003		6.2000e-003	6.2000e-003		97.8412	97.8412	1.8800e-003	1.7900e-003	98.4226
Mobile	1.6749	6.5356	17.1400	0.0582	4.9405	0.0474	4.9879	1.3204	0.0442	1.3646		5,922.2426	5,922.2426	0.3109		5,930.0141
Total	**6.5529**	**6.7958**	**33.0717**	**0.0596**	**4.9405**	**0.1414**	**5.0818**	**1.3204**	**0.1382**	**1.4586**	**0.0000**	**6,048.6911**	**6,048.6911**	**0.3405**	**1.7900e-003**	**6,057.7375**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	3.40	16.04	13.92	27.06	29.16	10.59	28.75	29.16	10.17	27.72	0.00	27.05	27.05	22.30	0.00	27.04

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	1/1/2021	1/14/2021	5	10	
2	Grading	Grading	1/15/2021	2/25/2021	5	30	
3	Trenching	Trenching	2/26/2021	3/11/2021	5	10	
4	Building Construction	Building Construction	3/12/2021	12/16/2021	5	200	
5	Paving	Paving	11/15/2021	12/10/2021	5	20	
6	Architectural Coating	Architectural Coating	11/22/2021	12/17/2021	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 75

Acres of Paving: 3.24

Residential Indoor: 388,800; Residential Outdoor: 129,600; Non-Residential Indoor: 6,758; Non-Residential Outdoor: 2,253; Striped Parking Area: 9,168 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Trenching	Excavators	1	8.00	158	0.38
Trenching	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Trenching	Trenchers	1	8.00	78	0.50
Building Construction	Cranes	1	8.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	3	8.00	130	0.42
Paving	Paving Equipment	3	8.00	132	0.36
Paving	Rollers	3	8.00	80	0.38
Paving	Signal Boards	1	8.00	6	0.82
Paving	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Architectural Coating	Air Compressors	1	8.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Trenching	3	8.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	204.00	46.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	12	16.00	4.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	42.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Site Preparation - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	3.8882	40.4971	21.1543	0.0380		2.0445	2.0445		1.8809	1.8809		3,685.656 9	3,685.656 9	1.1920		3,715.457 3
Total	**3.8882**	**40.4971**	**21.1543**	**0.0380**	**18.0663**	**2.0445**	**20.1107**	**9.9307**	**1.8809**	**11.8116**		**3,685.656 9**	**3,685.656 9**	**1.1920**		**3,715.457 3**

3.2 Site Preparation - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0623	0.0405	0.4774	1.4700e-003	0.1479	1.0200e-003	0.1489	0.0392	9.4000e-004	0.0402		146.5994	146.5994	4.1800e-003		146.7040
Total	**0.0623**	**0.0405**	**0.4774**	**1.4700e-003**	**0.1479**	**1.0200e-003**	**0.1489**	**0.0392**	**9.4000e-004**	**0.0402**		**146.5994**	**146.5994**	**4.1800e-003**		**146.7040**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.1298	0.0000	8.1298	4.4688	0.0000	4.4688			0.0000			0.0000
Off-Road	3.8882	40.4971	21.1543	0.0380		2.0445	2.0445		1.8809	1.8809	0.0000	3,685.6569	3,685.6569	1.1920		3,715.4573
Total	**3.8882**	**40.4971**	**21.1543**	**0.0380**	**8.1298**	**2.0445**	**10.1743**	**4.4688**	**1.8809**	**6.3497**	**0.0000**	**3,685.6569**	**3,685.6569**	**1.1920**		**3,715.4573**

3.2 Site Preparation - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0623	0.0405	0.4774	1.4700e-003	0.1479	1.0200e-003	0.1489	0.0392	9.4000e-004	0.0402		146.5994	146.5994	4.1800e-003		146.7040
Total	**0.0623**	**0.0405**	**0.4774**	**1.4700e-003**	**0.1479**	**1.0200e-003**	**0.1489**	**0.0392**	**9.4000e-004**	**0.0402**		**146.5994**	**146.5994**	**4.1800e-003**		**146.7040**

3.3 Grading - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	4.1912	46.3998	30.8785	0.0620		1.9853	1.9853		1.8265	1.8265		6,007.0434	6,007.0434	1.9428		6,055.6134
Total	**4.1912**	**46.3998**	**30.8785**	**0.0620**	**8.6733**	**1.9853**	**10.6587**	**3.5965**	**1.8265**	**5.4230**		**6,007.0434**	**6,007.0434**	**1.9428**		**6,055.6134**

3.3 Grading - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0692	0.0449	0.5305	1.6300e-003	0.1643	1.1300e-003	0.1654	0.0436	1.0500e-003	0.0446		162.8882	162.8882	4.6500e-003		163.0044
Total	**0.0692**	**0.0449**	**0.5305**	**1.6300e-003**	**0.1643**	**1.1300e-003**	**0.1654**	**0.0436**	**1.0500e-003**	**0.0446**		**162.8882**	**162.8882**	**4.6500e-003**		**163.0044**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					3.9030	0.0000	3.9030	1.6184	0.0000	1.6184			0.0000			0.0000
Off-Road	4.1912	46.3998	30.8785	0.0620		1.9853	1.9853		1.8265	1.8265	0.0000	6,007.0434	6,007.0434	1.9428		6,055.6134
Total	**4.1912**	**46.3998**	**30.8785**	**0.0620**	**3.9030**	**1.9853**	**5.8883**	**1.6184**	**1.8265**	**3.4449**	**0.0000**	**6,007.0434**	**6,007.0434**	**1.9428**		**6,055.6134**

3.3 Grading - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0692	0.0449	0.5305	1.6300e-003	0.1643	1.1300e-003	0.1654	0.0436	1.0500e-003	0.0446		162.8882	162.8882	4.6500e-003		163.0044
Total	**0.0692**	**0.0449**	**0.5305**	**1.6300e-003**	**0.1643**	**1.1300e-003**	**0.1654**	**0.0436**	**1.0500e-003**	**0.0446**		**162.8882**	**162.8882**	**4.6500e-003**		**163.0044**

3.4 Trenching - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.7989	7.5613	8.1384	0.0117		0.4712	0.4712		0.4335	0.4335		1,128.0146	1,128.0146	0.3648		1,137.1351
Total	**0.7989**	**7.5613**	**8.1384**	**0.0117**		**0.4712**	**0.4712**		**0.4335**	**0.4335**		**1,128.0146**	**1,128.0146**	**0.3648**		**1,137.1351**

3.4 Trenching - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0277	0.0180	0.2122	6.5000e-004	0.0657	4.5000e-004	0.0662	0.0174	4.2000e-004	0.0179		65.1553	65.1553	1.8600e-003		65.2018
Total	**0.0277**	**0.0180**	**0.2122**	**6.5000e-004**	**0.0657**	**4.5000e-004**	**0.0662**	**0.0174**	**4.2000e-004**	**0.0179**		**65.1553**	**65.1553**	**1.8600e-003**		**65.2018**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.7989	7.5613	8.1384	0.0117		0.4712	0.4712		0.4335	0.4335	0.0000	1,128.0146	1,128.0146	0.3648		1,137.1351
Total	**0.7989**	**7.5613**	**8.1384**	**0.0117**		**0.4712**	**0.4712**		**0.4335**	**0.4335**	**0.0000**	**1,128.0146**	**1,128.0146**	**0.3648**		**1,137.1351**

3.4 Trenching - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0277	0.0180	0.2122	6.5000e-004	0.0657	4.5000e-004	0.0662	0.0174	4.2000e-004	0.0179		65.1553	65.1553	1.8600e-003		65.2018
Total	**0.0277**	**0.0180**	**0.2122**	**6.5000e-004**	**0.0657**	**4.5000e-004**	**0.0662**	**0.0174**	**4.2000e-004**	**0.0179**		**65.1553**	**65.1553**	**1.8600e-003**		**65.2018**

3.5 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.0228	18.7492	17.6706	0.0288		1.0251	1.0251		0.9625	0.9625		2,736.0438	2,736.0438	0.6751		2,752.9212
Total	**2.0228**	**18.7492**	**17.6706**	**0.0288**		**1.0251**	**1.0251**		**0.9625**	**0.9625**		**2,736.0438**	**2,736.0438**	**0.6751**		**2,752.9212**

3.5 Building Construction - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1391	4.6842	1.1937	0.0125	0.3114	9.8400e-003	0.3212	0.0896	9.4100e-003	0.0991		1,340.2190	1,340.2190	0.0958		1,342.6130
Worker	0.7056	0.4584	5.4109	0.0167	1.6758	0.0116	1.6874	0.4445	0.0107	0.4552		1,661.4594	1,661.4594	0.0474		1,662.6448
Total	**0.8447**	**5.1426**	**6.6046**	**0.0291**	**1.9872**	**0.0214**	**2.0086**	**0.5341**	**0.0201**	**0.5542**		**3,001.6783**	**3,001.6783**	**0.1432**		**3,005.2578**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.0228	18.7492	17.6706	0.0288		1.0251	1.0251		0.9625	0.9625	0.0000	2,736.0438	2,736.0438	0.6751		2,752.9212
Total	**2.0228**	**18.7492**	**17.6706**	**0.0288**		**1.0251**	**1.0251**		**0.9625**	**0.9625**	**0.0000**	**2,736.0438**	**2,736.0438**	**0.6751**		**2,752.9212**

3.5 Building Construction - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1391	4.6842	1.1937	0.0125	0.3114	9.8400e-003	0.3212	0.0896	9.4100e-003	0.0991		1,340.2190	1,340.2190	0.0958		1,342.6130
Worker	0.7056	0.4584	5.4109	0.0167	1.6758	0.0116	1.6874	0.4445	0.0107	0.4552		1,661.4594	1,661.4594	0.0474		1,662.6448
Total	**0.8447**	**5.1426**	**6.6046**	**0.0291**	**1.9872**	**0.0214**	**2.0086**	**0.5341**	**0.0201**	**0.5542**		**3,001.6783**	**3,001.6783**	**0.1432**		**3,005.2578**

3.6 Paving - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3152	23.5297	26.8013	0.0411		1.2541	1.2541		1.1549	1.1549		3,961.9300	3,961.9300	1.2705		3,993.6935
Paving	0.4244					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**2.7397**	**23.5297**	**26.8013**	**0.0411**		**1.2541**	**1.2541**		**1.1549**	**1.1549**		**3,961.9300**	**3,961.9300**	**1.2705**		**3,993.6935**

3.6 Paving - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0121	0.4073	0.1038	1.0800e-003	0.0271	8.6000e-004	0.0279	7.8000e-003	8.2000e-004	8.6100e-003		116.5408	116.5408	8.3300e-003		116.7490
Worker	0.0553	0.0360	0.4244	1.3100e-003	0.1314	9.1000e-004	0.1323	0.0349	8.4000e-004	0.0357		130.3105	130.3105	3.7200e-003		130.4035
Total	**0.0674**	**0.4433**	**0.5282**	**2.3900e-003**	**0.1585**	**1.7700e-003**	**0.1603**	**0.0427**	**1.6600e-003**	**0.0443**		**246.8513**	**246.8513**	**0.0121**		**247.1525**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3152	23.5297	26.8013	0.0411		1.2541	1.2541		1.1549	1.1549	0.0000	3,961.9300	3,961.9300	1.2705		3,993.6935
Paving	0.4244					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**2.7397**	**23.5297**	**26.8013**	**0.0411**		**1.2541**	**1.2541**		**1.1549**	**1.1549**	**0.0000**	**3,961.9300**	**3,961.9300**	**1.2705**		**3,993.6935**

3.6 Paving - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0121	0.4073	0.1038	1.0800e-003	0.0271	8.6000e-004	0.0279	7.8000e-003	8.2000e-004	8.6100e-003		116.5408	116.5408	8.3300e-003		116.7490
Worker	0.0553	0.0360	0.4244	1.3100e-003	0.1314	9.1000e-004	0.1323	0.0349	8.4000e-004	0.0357		130.3105	130.3105	3.7200e-003		130.4035
Total	**0.0674**	**0.4433**	**0.5282**	**2.3900e-003**	**0.1585**	**1.7700e-003**	**0.1603**	**0.0427**	**1.6600e-003**	**0.0443**		**246.8513**	**246.8513**	**0.0121**		**247.1525**

3.7 Architectural Coating - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	21.9867					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2919	2.0358	2.4234	3.9600e-003		0.1255	0.1255		0.1255	0.1255		375.2641	375.2641	0.0258		375.9079
Total	**22.2786**	**2.0358**	**2.4234**	**3.9600e-003**		**0.1255**	**0.1255**		**0.1255**	**0.1255**		**375.2641**	**375.2641**	**0.0258**		**375.9079**

3.7 Architectural Coating - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1453	0.0944	1.1140	3.4300e-003	0.3450	2.3800e-003	0.3474	0.0915	2.2000e-003	0.0937		342.0652	342.0652	9.7600e-003		342.3092
Total	**0.1453**	**0.0944**	**1.1140**	**3.4300e-003**	**0.3450**	**2.3800e-003**	**0.3474**	**0.0915**	**2.2000e-003**	**0.0937**		**342.0652**	**342.0652**	**9.7600e-003**		**342.3092**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	21.9867					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2919	2.0358	2.4234	3.9600e-003		0.1255	0.1255		0.1255	0.1255	0.0000	375.2641	375.2641	0.0258		375.9079
Total	**22.2786**	**2.0358**	**2.4234**	**3.9600e-003**		**0.1255**	**0.1255**		**0.1255**	**0.1255**	**0.0000**	**375.2641**	**375.2641**	**0.0258**		**375.9079**

3.7 Architectural Coating - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1453	0.0944	1.1140	3.4300e-003	0.3450	2.3800e-003	0.3474	0.0915	2.2000e-003	0.0937		342.0652	342.0652	9.7600e-003		342.3092
Total	**0.1453**	**0.0944**	**1.1140**	**3.4300e-003**	**0.3450**	**2.3800e-003**	**0.3474**	**0.0915**	**2.2000e-003**	**0.0937**		**342.0652**	**342.0652**	**9.7600e-003**		**342.3092**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Increase Density

Improve Destination Accessibility

Increase Transit Accessibility

Integrate Below Market Rate Housing

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.6749	6.5356	17.1400	0.0582	4.9405	0.0474	4.9879	1.3204	0.0442	1.3646		5,922.2426	5,922.2426	0.3109		5,930.0141
Unmitigated	1.9058	7.8334	22.4881	0.0803	6.9746	0.0641	7.0387	1.8640	0.0599	1.9239		8,164.5794	8,164.5794	0.4086		8,174.7943

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Mid Rise	1,152.00	1,152.00	1152.00	3,289,309	2,330,010
City Park	0.00	0.00	0.00		
General Office Building	0.00	0.00	0.00		
Parking Lot	0.00	0.00	0.00		
Recreational Swimming Pool	0.00	0.00	0.00		
Total	1,152.00	1,152.00	1,152.00	3,289,309	2,330,010

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Mid Rise	10.80	7.30	7.50	41.60	18.80	39.60	86	11	3
City Park	9.50	7.30	7.30	33.00	48.00	19.00	66	28	6
General Office Building	9.50	7.30	7.30	33.00	48.00	19.00	77	19	4
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Recreational Swimming Pool	9.50	7.30	7.30	33.00	48.00	19.00	52	39	9

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Mid Rise	0.598645	0.040929	0.181073	0.106149	0.015683	0.005479	0.016317	0.023976	0.001926	0.001932	0.006016	0.000753	0.001122
City Park	0.598645	0.040929	0.181073	0.106149	0.015683	0.005479	0.016317	0.023976	0.001926	0.001932	0.006016	0.000753	0.001122
General Office Building	0.598645	0.040929	0.181073	0.106149	0.015683	0.005479	0.016317	0.023976	0.001926	0.001932	0.006016	0.000753	0.001122
Parking Lot	0.598645	0.040929	0.181073	0.106149	0.015683	0.005479	0.016317	0.023976	0.001926	0.001932	0.006016	0.000753	0.001122
Recreational Swimming Pool	0.598645	0.040929	0.181073	0.106149	0.015683	0.005479	0.016317	0.023976	0.001926	0.001932	0.006016	0.000753	0.001122

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Install High Efficiency Lighting

Install Energy Efficient Appliances

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	8.9700e-003	0.0769	0.0346	4.9000e-004		6.2000e-003	6.2000e-003		6.2000e-003	6.2000e-003		97.8412	97.8412	1.8800e-003	1.7900e-003	98.4226
NaturalGas Unmitigated	8.9700e-003	0.0769	0.0346	4.9000e-004		6.2000e-003	6.2000e-003		6.2000e-003	6.2000e-003		97.8412	97.8412	1.8800e-003	1.7900e-003	98.4226

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Mid Rise	786.369	8.4800e-003	0.0725	0.0308	4.6000e-004		5.8600e-003	5.8600e-003		5.8600e-003	5.8600e-003		92.5140	92.5140	1.7700e-003	1.7000e-003	93.0638
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
General Office Building	45.281	4.9000e-004	4.4400e-003	3.7300e-003	3.0000e-005		3.4000e-004	3.4000e-004		3.4000e-004	3.4000e-004		5.3272	5.3272	1.0000e-004	1.0000e-004	5.3588
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**8.9700e-003**	**0.0769**	**0.0346**	**4.9000e-004**		**6.2000e-003**	**6.2000e-003**		**6.2000e-003**	**6.2000e-003**		**97.8412**	**97.8412**	**1.8700e-003**	**1.8000e-003**	**98.4226**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Mid Rise	0.786369	8.4800e-003	0.0725	0.0308	4.6000e-004		5.8600e-003	5.8600e-003		5.8600e-003	5.8600e-003		92.5140	92.5140	1.7700e-003	1.7000e-003	93.0638
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
General Office Building	0.045281	4.9000e-004	4.4400e-003	3.7300e-003	3.0000e-005		3.4000e-004	3.4000e-004		3.4000e-004	3.4000e-004		5.3272	5.3272	1.0000e-004	1.0000e-004	5.3588
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**8.9700e-003**	**0.0769**	**0.0346**	**4.9000e-004**		**6.2000e-003**	**6.2000e-003**		**6.2000e-003**	**6.2000e-003**		**97.8412**	**97.8412**	**1.8700e-003**	**1.8000e-003**	**98.4226**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

No Hearths Installed

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	4.8690	0.1832	15.8971	8.4000e-004		0.0878	0.0878		0.0878	0.0878	0.0000	28.6073	28.6073	0.0277	0.0000	29.3008
Unmitigated	4.8690	0.1832	15.8971	8.4000e-004		0.0878	0.0878		0.0878	0.0878	0.0000	28.6073	28.6073	0.0277	0.0000	29.3008

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.1205					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	4.2659					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.4827	0.1832	15.8971	8.4000e-004		0.0878	0.0878		0.0878	0.0878		28.6073	28.6073	0.0277		29.3008
Total	**4.8690**	**0.1832**	**15.8971**	**8.4000e-004**		**0.0878**	**0.0878**		**0.0878**	**0.0878**	**0.0000**	**28.6073**	**28.6073**	**0.0277**	**0.0000**	**29.3008**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.1205					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	4.2659					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.4827	0.1832	15.8971	8.4000e-004		0.0878	0.0878		0.0878	0.0878		28.6073	28.6073	0.0277		29.3008
Total	**4.8690**	**0.1832**	**15.8971**	**8.4000e-004**		**0.0878**	**0.0878**		**0.0878**	**0.0878**	**0.0000**	**28.6073**	**28.6073**	**0.0277**	**0.0000**	**29.3008**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

West Oaks Multi-Family Housing Project

San Diego County APCD Air District, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	2.71	1000sqft	0.06	2,705.00	0
Parking Lot	382.00	Space	3.24	152,800.00	0
City Park	2.93	Acre	2.93	127,630.80	0
Recreational Swimming Pool	1.80	1000sqft	0.04	1,800.00	0
Apartments Mid Rise	192.00	Dwelling Unit	1.63	192,000.00	549

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.6	**Precipitation Freq (Days)**	40
Climate Zone	13			**Operational Year**	2022
Utility Company	San Diego Gas & Electric				
CO2 Intensity (lb/MWhr)	448.3	**CH4 Intensity (lb/MWhr)**	0.018	**N2O Intensity (lb/MWhr)**	0.004

1.3 User Entered Comments & Non-Default Data

Project Characteristics - GHG intensity based on SDG&E energy mix.

Land Use - Based on site plan.

Construction Phase - See Section 7.2.1 for Construction Details.

Off-road Equipment - See Section 2.6.2 for Construction Details.

Off-road Equipment - See Section 7.2.1 for Construction Details.

Off-road Equipment - See Section 7.2.1 for Construction Details.

Off-road Equipment - See Section 7.2.1 for Construction Details.

Off-road Equipment - See Section 7.2.1 for Construction Details.

Off-road Equipment - See Section 7.2.1 for Construction Details.

Off-road Equipment - See Section 7.2.1 for Construction Details.

Trips and VMT - CalEEMod defaults.

On-road Fugitive Dust - CalEEMod defaults.

Demolition - No demolition of structures anticipated for this project.

Grading - See Section 7.2.1 for Construction Details.

Architectural Coating - Applicant specified low-VOC, 5 g/L for interior and 50 g/L for exterior. The paving VOC is in accordance with SDAPCD Rule 67.0.1.

Vehicle Trips - Based on the Traffic Impact Analysis.

Vehicle Emission Factors - CalEEMod defaults.

Vehicle Emission Factors - CalEEMod defaults.

Vehicle Emission Factors - CalEEMod defaults.

Road Dust - CalEEMod defaults.

Woodstoves - There are no wood or natural gas burning stoves or fireplaces.

Consumer Products - CalEEMod defaults.

Area Coating - Applicant specified low-VOC, 5 g/L for interior and 50 g/L for exterior. The paving VOC is in accordance with SDAPCD Rule 67.0.1.

Landscape Equipment - CalEEMod defaults.

Energy Use - Includes electric water heaters and HVAC.

Water And Wastewater - CalEEMod defaults.

Solid Waste - CalEEMod defaults.

Land Use Change - This was calculated outside of CalEEMod.

Sequestration - This was calculated outside of CalEEMod.

Construction Off-road Equipment Mitigation - Fugitive dust mitigation in accordance with SDAPCD Rule 55.

Mobile Land Use Mitigation - Increased density, accessibility, transit accessbility, and below market rate units.

Mobile Commute Mitigation - No commute mitigation.

Area Mitigation - It was conservatively assumed 5 g/L for interior and 50 g/L for exterior.

Energy Mitigation - LED or other efficient lighting in 75% of the luminaires and Energy Star appliances.

Water Mitigation - Low flow fixtures and water-use efficient irrigation.

Waste Mitigation - In accordance with AB 341.

Operational Off-Road Equipment -

Fleet Mix -

Stationary Sources - Emergency Generators and Fire Pumps - This does not apply to this project.

Stationary Sources - Process Boilers - Does not apply to this project.

Stationary Sources - User Defined - Does not apply to this project.

Stationary Sources - Emergency Generators and Fire Pumps EF - This does not apply to this project.

Stationary Sources - Process Boilers EF - Does not apply to this project.

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	EF_Nonresidential_Exterior	250.00	50.00
tblArchitecturalCoating	EF_Nonresidential_Interior	250.00	5.00
tblArchitecturalCoating	EF_Parking	250.00	100.00
tblArchitecturalCoating	EF_Residential_Exterior	250.00	50.00
tblArchitecturalCoating	EF_Residential_Interior	250.00	5.00
tblAreaCoating	Area_EF_Nonresidential_Exterior	250	50
tblAreaCoating	Area_EF_Nonresidential_Interior	250	5
tblAreaCoating	Area_EF_Parking	250	100
tblAreaCoating	Area_EF_Residential_Exterior	250	50
tblAreaCoating	Area_EF_Residential_Interior	250	5
tblAreaMitigation	UseLowVOCPaintNonresidentialInteriorValue	50	5
tblAreaMitigation	UseLowVOCPaintParkingCheck	False	True

tblAreaMitigation	UseLowVOCPaintResidentialExteriorValue	5	50
tblEnergyUse	LightingElect	741.44	0.00
tblEnergyUse	LightingElect	3.81	0.00
tblEnergyUse	NT24E	3,054.10	0.00
tblEnergyUse	NT24E	4.97	0.00
tblEnergyUse	NT24NG	4,180.00	0.00
tblEnergyUse	NT24NG	4.20	0.00
tblEnergyUse	T24E	209.39	7,389.69
tblEnergyUse	T24E	4.66	18.02
tblEnergyUse	T24NG	3,248.74	1,494.92
tblEnergyUse	T24NG	15.99	6.11
tblFireplaces	FireplaceDayYear	82.00	0.00
tblFireplaces	FireplaceHourDay	3.00	0.00
tblFireplaces	FireplaceWoodMass	3,078.40	0.00
tblFireplaces	NumberGas	105.60	0.00
tblFireplaces	NumberNoFireplace	19.20	0.00
tblFireplaces	NumberWood	67.20	0.00
tblLandUse	LandUseSquareFeet	2,710.00	2,705.00
tblLandUse	LotAcreage	3.44	3.24
tblLandUse	LotAcreage	5.05	1.63
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	2.00
tblOffRoadEquipment	UsageHours	6.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00

tblOffRoadEquipment	UsageHours	7.00	8.00
tblProjectCharacteristics	CH4IntensityFactor	0.029	0.018
tblProjectCharacteristics	CO2IntensityFactor	720.49	448.3
tblProjectCharacteristics	N2OIntensityFactor	0.006	0.004
tblTripsAndVMT	VendorTripNumber	67.00	46.00
tblTripsAndVMT	VendorTripNumber	0.00	4.00
tblTripsAndVMT	WorkerTripNumber	258.00	204.00
tblTripsAndVMT	WorkerTripNumber	30.00	16.00
tblTripsAndVMT	WorkerTripNumber	52.00	42.00
tblVehicleTrips	ST_TR	6.39	6.00
tblVehicleTrips	ST_TR	22.75	0.00
tblVehicleTrips	ST_TR	2.46	0.00
tblVehicleTrips	ST_TR	9.10	0.00
tblVehicleTrips	SU_TR	5.86	6.00
tblVehicleTrips	SU_TR	16.74	0.00
tblVehicleTrips	SU_TR	1.05	0.00
tblVehicleTrips	SU_TR	13.60	0.00
tblVehicleTrips	WD_TR	6.65	6.00
tblVehicleTrips	WD_TR	1.89	0.00
tblVehicleTrips	WD_TR	11.03	0.00
tblVehicleTrips	WD_TR	33.82	0.00
tblWoodstoves	NumberCatalytic	9.60	0.00
tblWoodstoves	NumberNoncatalytic	9.60	0.00
tblWoodstoves	WoodstoveDayYear	82.00	0.00
tblWoodstoves	WoodstoveWoodMass	3,019.20	0.00

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	28.2280	50.0535	54.8724	0.1072	18.2141	2.4307	20.2596	9.9699	2.2672	11.8517	0.0000	10,495.4490	10,495.4490	2.1395	0.0000	10,548.9362
Maximum	**28.2280**	**50.0535**	**54.8724**	**0.1072**	**18.2141**	**2.4307**	**20.2596**	**9.9699**	**2.2672**	**11.8517**	**0.0000**	**10,495.4490**	**10,495.4490**	**2.1395**	**0.0000**	**10,548.9362**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2021	28.2280	50.0535	54.8724	0.1072	8.2777	2.4307	10.3232	4.5080	2.2672	6.3899	0.0000	10,495.4490	10,495.4490	2.1395	0.0000	10,548.9362
Maximum	**28.2280**	**50.0535**	**54.8724**	**0.1072**	**8.2777**	**2.4307**	**10.3232**	**4.5080**	**2.2672**	**6.3899**	**0.0000**	**10,495.4490**	**10,495.4490**	**2.1395**	**0.0000**	**10,548.9362**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**54.55**	**0.00**	**49.05**	**54.78**	**0.00**	**46.08**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	4.8690	0.1832	15.8971	8.4000e-004		0.0878	0.0878		0.0878	0.0878	0.0000	28.6073	28.6073	0.0277	0.0000	29.3008
Energy	8.9700e-003	0.0769	0.0346	4.9000e-004		6.2000e-003	6.2000e-003		6.2000e-003	6.2000e-003		97.8412	97.8412	1.8800e-003	1.7900e-003	98.4226
Mobile	1.8483	8.0503	22.0273	0.0762	6.9746	0.0646	7.0391	1.8640	0.0603	1.9243		7,745.5387	7,745.5387	0.4100		7,755.7880
Total	**6.7263**	**8.3104**	**37.9590**	**0.0775**	**6.9746**	**0.1585**	**7.1331**	**1.8640**	**0.1543**	**2.0183**	**0.0000**	**7,871.9872**	**7,871.9872**	**0.4396**	**1.7900e-003**	**7,883.5114**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	4.8690	0.1832	15.8971	8.4000e-004		0.0878	0.0878		0.0878	0.0878	0.0000	28.6073	28.6073	0.0277	0.0000	29.3008
Energy	8.9700e-003	0.0769	0.0346	4.9000e-004		6.2000e-003	6.2000e-003		6.2000e-003	6.2000e-003		97.8412	97.8412	1.8800e-003	1.7900e-003	98.4226
Mobile	1.6220	6.6720	17.1525	0.0552	4.9405	0.0478	4.9883	1.3204	0.0447	1.3650		5,613.3301	5,613.3301	0.3151		5,621.2071
Total	**6.5000**	**6.9322**	**33.0842**	**0.0565**	**4.9405**	**0.1418**	**5.0823**	**1.3204**	**0.1386**	**1.4590**	**0.0000**	**5,739.7785**	**5,739.7785**	**0.3447**	**1.7900e-003**	**5,748.9305**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	3.36	16.58	12.84	27.09	29.16	10.57	28.75	29.16	10.15	27.71	0.00	27.09	27.09	21.59	0.00	27.08

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	1/1/2021	1/14/2021	5	10	
2	Grading	Grading	1/15/2021	2/25/2021	5	30	
3	Trenching	Trenching	2/26/2021	3/11/2021	5	10	
4	Building Construction	Building Construction	3/12/2021	12/16/2021	5	200	
5	Paving	Paving	11/15/2021	12/10/2021	5	20	
6	Architectural Coating	Architectural Coating	11/22/2021	12/17/2021	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 75

Acres of Paving: 3.24

Residential Indoor: 388,800; Residential Outdoor: 129,600; Non-Residential Indoor: 6,758; Non-Residential Outdoor: 2,253; Striped Parking Area: 9,168 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	1	8.00	187	0.41
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Trenching	Excavators	1	8.00	158	0.38
Trenching	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Trenching	Trenchers	1	8.00	78	0.50
Building Construction	Cranes	1	8.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Building Construction	Tractors/Loaders/Backhoes	3	8.00	97	0.37
Building Construction	Welders	1	8.00	46	0.45
Paving	Pavers	3	8.00	130	0.42
Paving	Paving Equipment	3	8.00	132	0.36
Paving	Rollers	3	8.00	80	0.38
Paving	Signal Boards	1	8.00	6	0.82
Paving	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Architectural Coating	Air Compressors	1	8.00	78	0.48

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Trenching	3	8.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	204.00	46.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	12	16.00	4.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	42.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

3.2 Site Preparation - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	3.8882	40.4971	21.1543	0.0380		2.0445	2.0445		1.8809	1.8809		3,685.6569	3,685.6569	1.1920		3,715.4573
Total	**3.8882**	**40.4971**	**21.1543**	**0.0380**	**18.0663**	**2.0445**	**20.1107**	**9.9307**	**1.8809**	**11.8116**		**3,685.6569**	**3,685.6569**	**1.1920**		**3,715.4573**

3.2 Site Preparation - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0706	0.0454	0.4488	1.3800e-003	0.1479	1.0200e-003	0.1489	0.0392	9.4000e-004	0.0402		137.6186	137.6186	3.9500e-003		137.7174
Total	**0.0706**	**0.0454**	**0.4488**	**1.3800e-003**	**0.1479**	**1.0200e-003**	**0.1489**	**0.0392**	**9.4000e-004**	**0.0402**		**137.6186**	**137.6186**	**3.9500e-003**		**137.7174**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.1298	0.0000	8.1298	4.4688	0.0000	4.4688			0.0000			0.0000
Off-Road	3.8882	40.4971	21.1543	0.0380		2.0445	2.0445		1.8809	1.8809	0.0000	3,685.6569	3,685.6569	1.1920		3,715.4573
Total	**3.8882**	**40.4971**	**21.1543**	**0.0380**	**8.1298**	**2.0445**	**10.1743**	**4.4688**	**1.8809**	**6.3497**	**0.0000**	**3,685.6569**	**3,685.6569**	**1.1920**		**3,715.4573**

3.2 Site Preparation - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0706	0.0454	0.4488	1.3800e-003	0.1479	1.0200e-003	0.1489	0.0392	9.4000e-004	0.0402		137.6186	137.6186	3.9500e-003		137.7174
Total	**0.0706**	**0.0454**	**0.4488**	**1.3800e-003**	**0.1479**	**1.0200e-003**	**0.1489**	**0.0392**	**9.4000e-004**	**0.0402**		**137.6186**	**137.6186**	**3.9500e-003**		**137.7174**

3.3 Grading - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.6733	0.0000	8.6733	3.5965	0.0000	3.5965			0.0000			0.0000
Off-Road	4.1912	46.3998	30.8785	0.0620		1.9853	1.9853		1.8265	1.8265		6,007.0434	6,007.0434	1.9428		6,055.6134
Total	**4.1912**	**46.3998**	**30.8785**	**0.0620**	**8.6733**	**1.9853**	**10.6587**	**3.5965**	**1.8265**	**5.4230**		**6,007.0434**	**6,007.0434**	**1.9428**		**6,055.6134**

3.3 Grading - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0785	0.0505	0.4987	1.5300e-003	0.1643	1.1300e-003	0.1654	0.0436	1.0500e-003	0.0446		152.9095	152.9095	4.3900e-003		153.0193
Total	**0.0785**	**0.0505**	**0.4987**	**1.5300e-003**	**0.1643**	**1.1300e-003**	**0.1654**	**0.0436**	**1.0500e-003**	**0.0446**		**152.9095**	**152.9095**	**4.3900e-003**		**153.0193**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					3.9030	0.0000	3.9030	1.6184	0.0000	1.6184			0.0000			0.0000
Off-Road	4.1912	46.3998	30.8785	0.0620		1.9853	1.9853		1.8265	1.8265	0.0000	6,007.0434	6,007.0434	1.9428		6,055.6134
Total	**4.1912**	**46.3998**	**30.8785**	**0.0620**	**3.9030**	**1.9853**	**5.8883**	**1.6184**	**1.8265**	**3.4449**	**0.0000**	**6,007.0434**	**6,007.0434**	**1.9428**		**6,055.6134**

3.3 Grading - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0785	0.0505	0.4987	1.5300e-003	0.1643	1.1300e-003	0.1654	0.0436	1.0500e-003	0.0446		152.9095	152.9095	4.3900e-003		153.0193
Total	**0.0785**	**0.0505**	**0.4987**	**1.5300e-003**	**0.1643**	**1.1300e-003**	**0.1654**	**0.0436**	**1.0500e-003**	**0.0446**		**152.9095**	**152.9095**	**4.3900e-003**		**153.0193**

3.4 Trenching - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.7989	7.5613	8.1384	0.0117		0.4712	0.4712		0.4335	0.4335		1,128.0146	1,128.0146	0.3648		1,137.1351
Total	**0.7989**	**7.5613**	**8.1384**	**0.0117**		**0.4712**	**0.4712**		**0.4335**	**0.4335**		**1,128.0146**	**1,128.0146**	**0.3648**		**1,137.1351**

3.4 Trenching - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0314	0.0202	0.1995	6.1000e-004	0.0657	4.5000e-004	0.0662	0.0174	4.2000e-004	0.0179		61.1638	61.1638	1.7600e-003		61.2077
Total	**0.0314**	**0.0202**	**0.1995**	**6.1000e-004**	**0.0657**	**4.5000e-004**	**0.0662**	**0.0174**	**4.2000e-004**	**0.0179**		**61.1638**	**61.1638**	**1.7600e-003**		**61.2077**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	0.7989	7.5613	8.1384	0.0117		0.4712	0.4712		0.4335	0.4335	0.0000	1,128.0146	1,128.0146	0.3648		1,137.1351
Total	**0.7989**	**7.5613**	**8.1384**	**0.0117**		**0.4712**	**0.4712**		**0.4335**	**0.4335**	**0.0000**	**1,128.0146**	**1,128.0146**	**0.3648**		**1,137.1351**

3.4 Trenching - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0314	0.0202	0.1995	6.1000e-004	0.0657	4.5000e-004	0.0662	0.0174	4.2000e-004	0.0179		61.1638	61.1638	1.7600e-003		61.2077
Total	**0.0314**	**0.0202**	**0.1995**	**6.1000e-004**	**0.0657**	**4.5000e-004**	**0.0662**	**0.0174**	**4.2000e-004**	**0.0179**		**61.1638**	**61.1638**	**1.7600e-003**		**61.2077**

3.5 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.0228	18.7492	17.6706	0.0288		1.0251	1.0251		0.9625	0.9625		2,736.0438	2,736.0438	0.6751		2,752.9212
Total	**2.0228**	**18.7492**	**17.6706**	**0.0288**		**1.0251**	**1.0251**		**0.9625**	**0.9625**		**2,736.0438**	**2,736.0438**	**0.6751**		**2,752.9212**

3.5 Building Construction - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1466	4.6717	1.3292	0.0121	0.3114	0.0102	0.3216	0.0896	9.7900e-003	0.0994		1,305.5688	1,305.5688	0.1017		1,308.1115
Worker	0.8002	0.5146	5.0862	0.0157	1.6758	0.0116	1.6874	0.4445	0.0107	0.4552		1,559.6771	1,559.6771	0.0448		1,560.7973
Total	**0.9468**	**5.1863**	**6.4154**	**0.0278**	**1.9872**	**0.0218**	**2.0090**	**0.5341**	**0.0205**	**0.5546**		**2,865.2458**	**2,865.2458**	**0.1465**		**2,868.9088**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.0228	18.7492	17.6706	0.0288		1.0251	1.0251		0.9625	0.9625	0.0000	2,736.0438	2,736.0438	0.6751		2,752.9212
Total	**2.0228**	**18.7492**	**17.6706**	**0.0288**		**1.0251**	**1.0251**		**0.9625**	**0.9625**	**0.0000**	**2,736.0438**	**2,736.0438**	**0.6751**		**2,752.9212**

3.5 Building Construction - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.1466	4.6717	1.3292	0.0121	0.3114	0.0102	0.3216	0.0896	9.7900e-003	0.0994		1,305.568 8	1,305.568 8	0.1017		1,308.1115
Worker	0.8002	0.5146	5.0862	0.0157	1.6758	0.0116	1.6874	0.4445	0.0107	0.4552		1,559.677 1	1,559.677 1	0.0448		1,560.797 3
Total	**0.9468**	**5.1863**	**6.4154**	**0.0278**	**1.9872**	**0.0218**	**2.0090**	**0.5341**	**0.0205**	**0.5546**		**2,865.245 8**	**2,865.245 8**	**0.1465**		**2,868.908 8**

3.6 Paving - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3152	23.5297	26.8013	0.0411		1.2541	1.2541		1.1549	1.1549		3,961.930 0	3,961.930 0	1.2705		3,993.693 5
Paving	0.4244					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**2.7397**	**23.5297**	**26.8013**	**0.0411**		**1.2541**	**1.2541**		**1.1549**	**1.1549**		**3,961.930 0**	**3,961.930 0**	**1.2705**		**3,993.693 5**

3.6 Paving - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0128	0.4062	0.1156	1.0600e-003	0.0271	8.9000e-004	0.0280	7.8000e-003	8.5000e-004	8.6500e-003		113.5277	113.5277	8.8400e-003		113.7488
Worker	0.0628	0.0404	0.3989	1.2300e-003	0.1314	9.1000e-004	0.1323	0.0349	8.4000e-004	0.0357		122.3276	122.3276	3.5100e-003		122.4155
Total	**0.0755**	**0.4466**	**0.5145**	**2.2900e-003**	**0.1585**	**1.8000e-003**	**0.1603**	**0.0427**	**1.6900e-003**	**0.0444**		**235.8553**	**235.8553**	**0.0124**		**236.1643**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.3152	23.5297	26.8013	0.0411		1.2541	1.2541		1.1549	1.1549	0.0000	3,961.9300	3,961.9300	1.2705		3,993.6935
Paving	0.4244					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**2.7397**	**23.5297**	**26.8013**	**0.0411**		**1.2541**	**1.2541**		**1.1549**	**1.1549**	**0.0000**	**3,961.9300**	**3,961.9300**	**1.2705**		**3,993.6935**

3.6 Paving - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0128	0.4062	0.1156	1.0600e-003	0.0271	8.9000e-004	0.0280	7.8000e-003	8.5000e-004	8.6500e-003		113.5277	113.5277	8.8400e-003		113.7488
Worker	0.0628	0.0404	0.3989	1.2300e-003	0.1314	9.1000e-004	0.1323	0.0349	8.4000e-004	0.0357		122.3276	122.3276	3.5100e-003		122.4155
Total	**0.0755**	**0.4466**	**0.5145**	**2.2900e-003**	**0.1585**	**1.8000e-003**	**0.1603**	**0.0427**	**1.6900e-003**	**0.0444**		**235.8553**	**235.8553**	**0.0124**		**236.1643**

3.7 Architectural Coating - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	21.9867					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2919	2.0358	2.4234	3.9600e-003		0.1255	0.1255		0.1255	0.1255		375.2641	375.2641	0.0258		375.9079
Total	**22.2786**	**2.0358**	**2.4234**	**3.9600e-003**		**0.1255**	**0.1255**		**0.1255**	**0.1255**		**375.2641**	**375.2641**	**0.0258**		**375.9079**

3.7 Architectural Coating - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1647	0.1059	1.0472	3.2200e-003	0.3450	2.3800e-003	0.3474	0.0915	2.2000e-003	0.0937		321.1100	321.1100	9.2300e-003		321.3406
Total	**0.1647**	**0.1059**	**1.0472**	**3.2200e-003**	**0.3450**	**2.3800e-003**	**0.3474**	**0.0915**	**2.2000e-003**	**0.0937**		**321.1100**	**321.1100**	**9.2300e-003**		**321.3406**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	21.9867					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2919	2.0358	2.4234	3.9600e-003		0.1255	0.1255		0.1255	0.1255	0.0000	375.2641	375.2641	0.0258		375.9079
Total	**22.2786**	**2.0358**	**2.4234**	**3.9600e-003**		**0.1255**	**0.1255**		**0.1255**	**0.1255**	**0.0000**	**375.2641**	**375.2641**	**0.0258**		**375.9079**

3.7 Architectural Coating - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.1647	0.1059	1.0472	3.2200e-003	0.3450	2.3800e-003	0.3474	0.0915	2.2000e-003	0.0937		321.1100	321.1100	9.2300e-003		321.3406
Total	**0.1647**	**0.1059**	**1.0472**	**3.2200e-003**	**0.3450**	**2.3800e-003**	**0.3474**	**0.0915**	**2.2000e-003**	**0.0937**		**321.1100**	**321.1100**	**9.2300e-003**		**321.3406**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Increase Density

Improve Destination Accessibility

Increase Transit Accessibility

Integrate Below Market Rate Housing

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	1.6220	6.6720	17.1525	0.0552	4.9405	0.0478	4.9883	1.3204	0.0447	1.3650		5,613.3301	5,613.3301	0.3151		5,621.2071
Unmitigated	1.8483	8.0503	22.0273	0.0762	6.9746	0.0646	7.0391	1.8640	0.0603	1.9243		7,745.5387	7,745.5387	0.4100		7,755.7880

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Mid Rise	1,152.00	1,152.00	1152.00	3,289,309	2,330,010
City Park	0.00	0.00	0.00		
General Office Building	0.00	0.00	0.00		
Parking Lot	0.00	0.00	0.00		
Recreational Swimming Pool	0.00	0.00	0.00		
Total	1,152.00	1,152.00	1,152.00	3,289,309	2,330,010

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
Apartments Mid Rise	10.80	7.30	7.50	41.60	18.80	39.60	86	11	3
City Park	9.50	7.30	7.30	33.00	48.00	19.00	66	28	6
General Office Building	9.50	7.30	7.30	33.00	48.00	19.00	77	19	4
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Recreational Swimming Pool	9.50	7.30	7.30	33.00	48.00	19.00	52	39	9

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Apartments Mid Rise	0.598645	0.040929	0.181073	0.106149	0.015683	0.005479	0.016317	0.023976	0.001926	0.001932	0.006016	0.000753	0.001122
City Park	0.598645	0.040929	0.181073	0.106149	0.015683	0.005479	0.016317	0.023976	0.001926	0.001932	0.006016	0.000753	0.001122
General Office Building	0.598645	0.040929	0.181073	0.106149	0.015683	0.005479	0.016317	0.023976	0.001926	0.001932	0.006016	0.000753	0.001122
Parking Lot	0.598645	0.040929	0.181073	0.106149	0.015683	0.005479	0.016317	0.023976	0.001926	0.001932	0.006016	0.000753	0.001122
Recreational Swimming Pool	0.598645	0.040929	0.181073	0.106149	0.015683	0.005479	0.016317	0.023976	0.001926	0.001932	0.006016	0.000753	0.001122

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

Install High Efficiency Lighting

Install Energy Efficient Appliances

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	8.9700e-003	0.0769	0.0346	4.9000e-004		6.2000e-003	6.2000e-003		6.2000e-003	6.2000e-003		97.8412	97.8412	1.8800e-003	1.7900e-003	98.4226
NaturalGas Unmitigated	8.9700e-003	0.0769	0.0346	4.9000e-004		6.2000e-003	6.2000e-003		6.2000e-003	6.2000e-003		97.8412	97.8412	1.8800e-003	1.7900e-003	98.4226

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Mid Rise	786.369	8.4800e-003	0.0725	0.0308	4.6000e-004		5.8600e-003	5.8600e-003		5.8600e-003	5.8600e-003		92.5140	92.5140	1.7700e-003	1.7000e-003	93.0638
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
General Office Building	45.281	4.9000e-004	4.4400e-003	3.7300e-003	3.0000e-005		3.4000e-004	3.4000e-004		3.4000e-004	3.4000e-004		5.3272	5.3272	1.0000e-004	1.0000e-004	5.3588
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**8.9700e-003**	**0.0769**	**0.0346**	**4.9000e-004**		**6.2000e-003**	**6.2000e-003**		**6.2000e-003**	**6.2000e-003**		**97.8412**	**97.8412**	**1.8700e-003**	**1.8000e-003**	**98.4226**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
Apartments Mid Rise	0.786369	8.4800e-003	0.0725	0.0308	4.6000e-004		5.8600e-003	5.8600e-003		5.8600e-003	5.8600e-003		92.5140	92.5140	1.7700e-003	1.7000e-003	93.0638
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
General Office Building	0.045281	4.9000e-004	4.4400e-003	3.7300e-003	3.0000e-005		3.4000e-004	3.4000e-004		3.4000e-004	3.4000e-004		5.3272	5.3272	1.0000e-004	1.0000e-004	5.3588
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Recreational Swimming Pool	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**8.9700e-003**	**0.0769**	**0.0346**	**4.9000e-004**		**6.2000e-003**	**6.2000e-003**		**6.2000e-003**	**6.2000e-003**		**97.8412**	**97.8412**	**1.8700e-003**	**1.8000e-003**	**98.4226**

6.0 Area Detail

6.1 Mitigation Measures Area

Use Low VOC Paint - Residential Interior

Use Low VOC Paint - Residential Exterior

Use Low VOC Paint - Non-Residential Interior

Use Low VOC Paint - Non-Residential Exterior

No Hearths Installed

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	4.8690	0.1832	15.8971	8.4000e-004		0.0878	0.0878		0.0878	0.0878	0.0000	28.6073	28.6073	0.0277	0.0000	29.3008
Unmitigated	4.8690	0.1832	15.8971	8.4000e-004		0.0878	0.0878		0.0878	0.0878	0.0000	28.6073	28.6073	0.0277	0.0000	29.3008

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.1205					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	4.2659					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.4827	0.1832	15.8971	8.4000e-004		0.0878	0.0878		0.0878	0.0878		28.6073	28.6073	0.0277		29.3008
Total	**4.8690**	**0.1832**	**15.8971**	**8.4000e-004**		**0.0878**	**0.0878**		**0.0878**	**0.0878**	**0.0000**	**28.6073**	**28.6073**	**0.0277**	**0.0000**	**29.3008**

6.2 Area by SubCategory

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.1205					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	4.2659					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Hearth	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.4827	0.1832	15.8971	8.4000e-004		0.0878	0.0878		0.0878	0.0878		28.6073	28.6073	0.0277		29.3008
Total	**4.8690**	**0.1832**	**15.8971**	**8.4000e-004**		**0.0878**	**0.0878**		**0.0878**	**0.0878**	**0.0000**	**28.6073**	**28.6073**	**0.0277**	**0.0000**	**29.3008**

7.0 Water Detail

7.1 Mitigation Measures Water

Install Low Flow Bathroom Faucet

Install Low Flow Kitchen Faucet

Install Low Flow Toilet

Install Low Flow Shower

Use Water Efficient Irrigation System

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

APPENDIX B

Supplemental LOS Analysis

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SUPPLEMENTAL LEVEL OF SERVICE ANALYSIS

WEST OAKS

Carlsbad, California
October 28, 2020

LLG Ref. 3-16-2672

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SUPPLEMENTAL LEVEL OF SERVICE ANALYSIS

WEST OAKS

Carlsbad, California
October 28, 2020

1.0 INTRODUCTION

1.1 Project Description

The Project site is west of Palomar Oaks Way, south of Palomar Airport Road, and proposes to develop 192 multi-family residential units both north and south of West Oaks Way. West Oaks Way is a local road terminating in a cul-de-sac west of Palomar Oaks Way that is constructed but not open to traffic, with a gate and temporary barrier erected at its intersection with Palomar Oaks Way.

Project access is proposed via West Oaks Way from Palomar Oaks Way. A roundabout control is proposed for the project access intersection at West Oaks Way/ Palomar Oaks Way. Onsite pedestrian and bicycle circulation is proposed to connect with the existing pedestrian sidewalk on the south side of Palomar Airport Road at both the east and west ends of West Oaks Way. At the west end of West Oaks Way, a new emergency vehicular access bridge to Palomar Airport Road is proposed which will provide bicycle and pedestrian connectivity at the west end of the site. Bicycle racks and lockers are also proposed.

Figure 1–1 shows the vicinity map. ***Figure 1–2*** shows a more detailed Project area map. ***Figure 1–3*** shows the Project site plan.

1.2 Project Analysis

The auto LOS analysis is provided here for informational purposes only relative to transportation, though in support of other technical analyses required by CEQA (e.g., air quality). For roadway segment analysis, capacity is evaluated using the City of Carlsbad Roadway Capacity Tables. Intersection and roadway segment LOS are evaluated based on the most recent version of the *Highway Capacity Manual* (HCM) methodology.

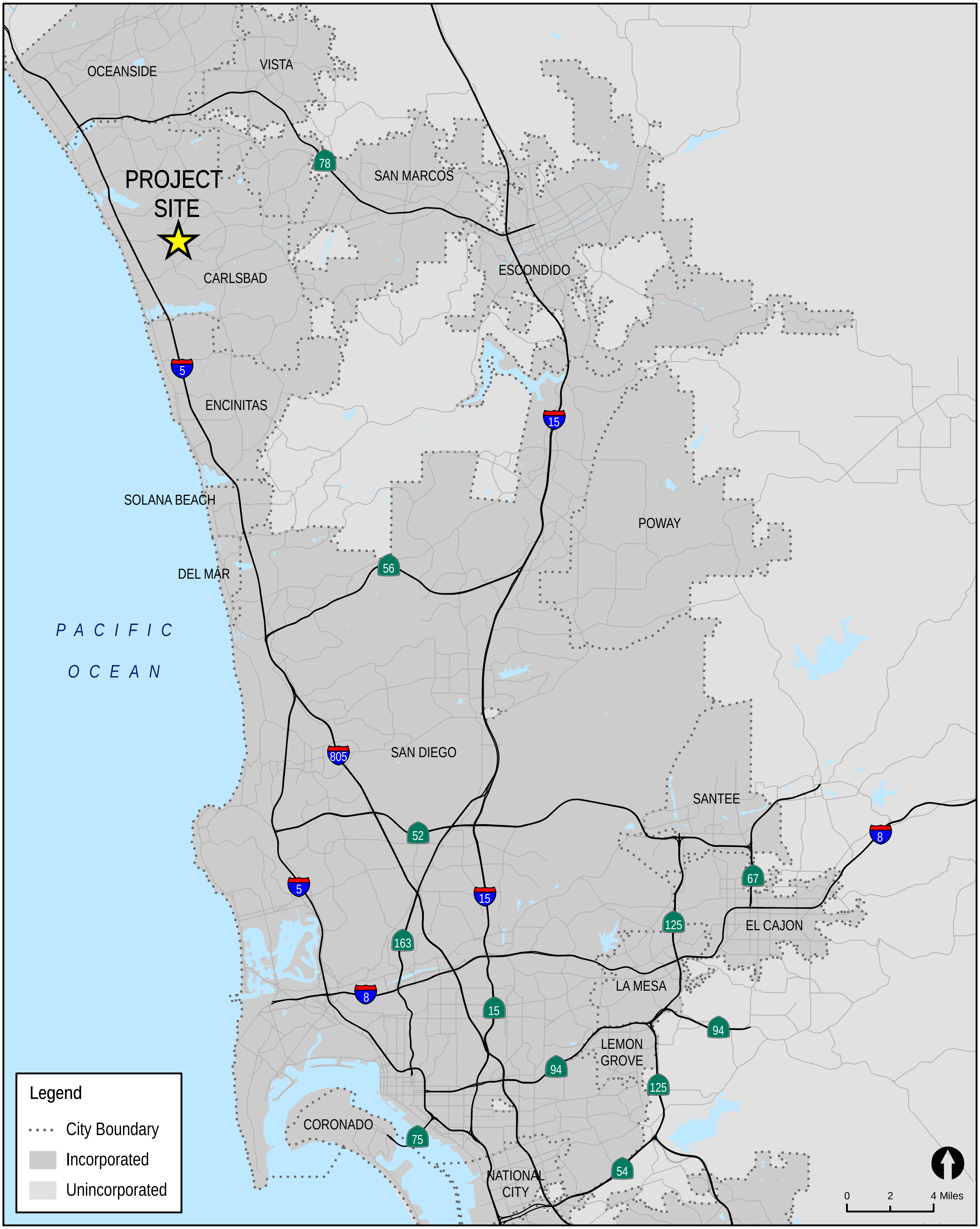

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Figure 1-1

Vicinity Map

West Oaks Property

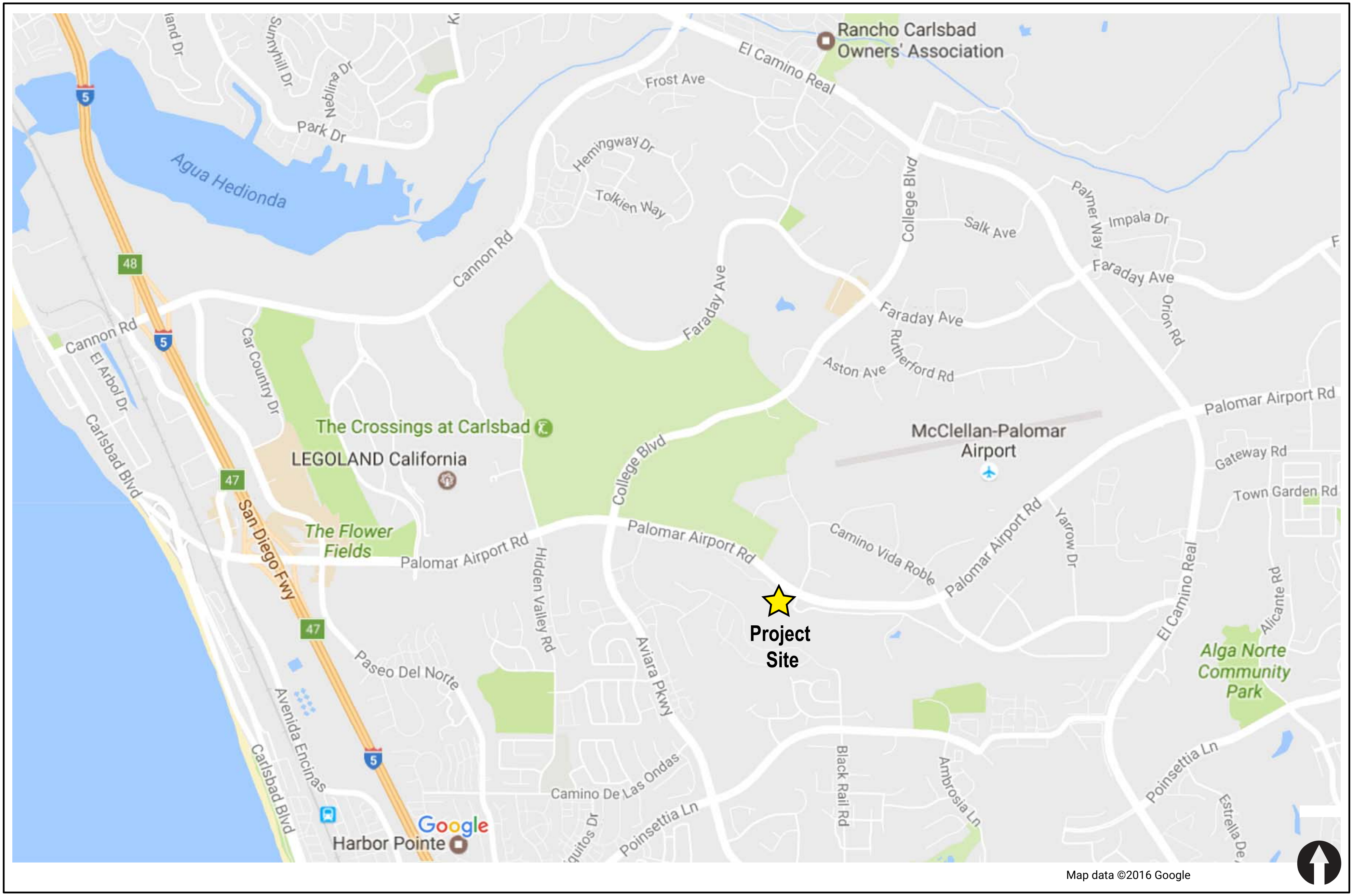

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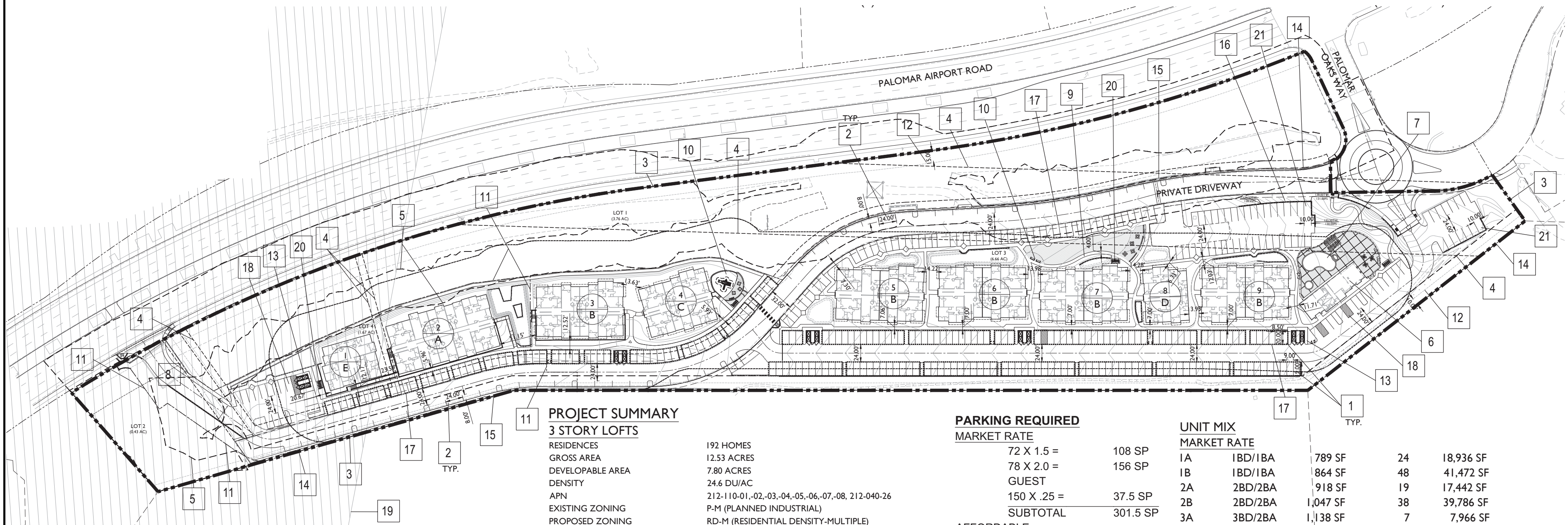
Figure 1-2

Project Area Map

West Oaks Property



PROJECT SUMMARY

3 STORY LOFTS

RESIDENCES	192 HOMES
GROSS AREA	12.53 ACRES
DEVELOPABLE AREA	7.80 ACRES
DENSITY	24.6 DU/AC
APN	212-110-01,-02,-03,-04,-05,-06,-07,-08, 212-040-26
EXISTING ZONING	P-M (PLANNED INDUSTRIAL)
PROPOSED ZONING	RD-M (RESIDENTIAL DENSITY-MULTIPLE)
EXISTING LAND USE	PI (PLANNED INDUSTRIAL)
PROPOSED LAND USE	R-30 (RESIDENTIAL)
LOCAL COASTAL PROGRAM	MELLO II SEGMENT
LOTS PROPOSED	4 LOTS
UNDEVELOPABLE AREA	4.73 AC
PARKING	384 SPACES
BLDG COVERAGE	12.8%
LANSCAPE AREA	23%
STORAGE	18,000 CUBIC FEET
WATER & SEWER DISTRICT	CARLSBAD MUNICIPAL WATER DISTRICT
SCHOOL DISTRICT	CARLSBAD UNIFIED SCHOOL DISTRICT
DRAINAGE DISCHARGE	73 CFS
MASTER DRAINAGE BASIN	ENCINAS

LEGAL DESCRIPTION:

LOTS 1 THROUGH 7 OF CARLSBAD TRACT NO. 82-04 PALOMAR OAKS. IN THE CITY OF CARLSBAD, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, ACCORDING TO MAP THEREOF NO. 11358, FILED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY, OCTOBER 23, 1985.

IN ADDITION, THAT PORTION OF THAT CERTAIN PARCEL OF LAND SHOWN AND DESIGNATED AS "DESCRIPTION NO. 3, 78.07 ACRES" ON RECORD OF SURVEY MAP NO. 5715, FILED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY, DECEMBER 19, 1960, BEING A PORTION OF LOT "G" OF THE RANCHO AGUA HEDIONDA, IN THE CITY OF CARLSBAD, COUNTY OF SAN DIEGO, STATE OF CALIFORNIA, ACCORDING TO MAP NO. 823, FILED IN THE OFFICE OF THE COUNTY RECORDER OF SAN DIEGO COUNTY, NOVEMBER 16 1896.

PARKING REQUIRED

MARKET RATE		
	72 X 1.5 =	108 SP
	78 X 2.0 =	156 SP
	GUEST	
	150 X .25 =	37.5 SP
	SUBTOTAL	301.5 SP
AFFORDABLE		
	24 X 1.5 =	36 SP
	18 X 2.0 =	36 SP
	GUEST	
	42 X .25 =	10.5 SP
	SUBTOTAL	82.5 SP
TOTAL REQUIRED		384 SP
		(192 COVERED)

PARKING PROVIDED

MARKET RATE		
	PERPENDICULAR	285 SP
	PARALLEL	16 SP
	SUBTOTAL	301 SP
AFFORDABLE		
	PERPENDICULAR	54 SP
	PARALLEL	29 SP
	SUBTOTAL	83 SP*
TOTAL		384 SP
		(203 COVERED)

*AFFORDABLE CONCESSION:
42 SP < 150' WALKING DISTANCE
41 SP > 300' WALKING DISTANCE

UNIT MIX

MARKET RATE				
1A	1BD/1BA	789 SF	24	18,936 SF
1B	1BD/1BA	864 SF	48	41,472 SF
2A	2BD/2BA	918 SF	19	17,442 SF
2B	2BD/2BA	1,047 SF	38	39,786 SF
3A	3BD/2BA	1,138 SF	7	7,966 SF
3B	3BD/2BA	1,243 SF	14	17,402 SF
	SUBTOTAL		150	143,004 SF
AFFORDABLE				
	1BD/1BA	550 SF	24	13,200 SF
	2BD/2BA	750 SF	12	9,000 SF
	3BD/2BA	1,020 SF	6	6,120 SF
	SUBTOTAL		42	28,320 SF
TOTAL			192	171,324 SF

BUILDING MIX / COVERAGE AREA

			GROSS SF	OCC. / CONST.
BLDG A	10,235 GSF	1	10,235 GSF	R-2/ VA
BLDG B	8,652 GSF	5	43,260 GSF	R-2 / VA
BLDG C	6,564 GSF	1	6,564 GSF	R-2 / VA
BLDG D	4,291 GSF	1	8,582 GSF	R-2 / VA
BLDG E	4,291 GSF	1	8,582 GSF	R-2 / VA
LEASING	2,705 GSF	1	2,705 GSF	B / VB
TOTAL		11	71,346 GSF	

TRASH ENCLOSURES

1 BIN/10 DU = 20 BINS FOR 200 DU
4 BINS PER ENCLOSURE = 5 TOTAL TRASH ENCLOSURES

LEGEND

BUILDING NUMBER — 7
BUILDING TYPE — B

SITE PLAN KEYNOTES

1	TYP. PARKING STALL(9' X 19' or 8.5' X 20')	11	LOT LINE
2	PARALLEL PARKING STALL(8' X 24')	12	SETBACK LINE
3	PROPERTY LINE	13	TRASH ENCLOSURE
4	SDG&E EASEMENT	14	SITE FENCE
5	RIPARIAN BUFFER	15	EXISTING RETAINING WALL
6	REC / LEASING BUILDING	16	PROPOSED RETAINING WALL
7	POOL	17	CARPORTS
8	EMERGENCY ACCESS	18	ACCESSIBLE PARKING STALL
9	HARDSCAPE PATHWAYS	19	AIRPORT SAFETY ZONE
10	REC AREA	20	BIKE RACK
		21	10' WIDE STALL NEXT TO WALLS

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Figure 1-3

Site Plan

WEST OAKS PROPERTY

2.0 ANALYSIS APPROACH & METHODOLOGY

This analysis based on auto delay and capacity is provided for informational purposes relative to transportation though to support other technical analyses required by CEQA (e.g., air quality). No determinations of significance relative to transportation are made based on this analysis. Traffic analysis for CEQA purposes using vehicle miles traveled (VMT) was conducted by Fehr & Peers and is provided under separate cover.

2.1 Study Area

The study area for Auto LOS analysis was determined per the SANTEC/ITE Guidelines for Traffic Impact Studies in the San Diego Region. Per SANTEC/ITE Guidelines, the study area must include:

- All local roadway segments (including all State surface routes), intersections, and mainline freeway locations where the proposed project will add 50 or more peak hour trips in either direction to the existing roadway traffic.
- All freeway entrance and exit ramps where the proposed project will add 20 or more peak hour trips.

Based on the Project's trip generation and distribution (*Section 4.0*), the following locations are included in the Project study area for Auto LOS Analysis:

Intersections

- Palomar Airport Road / Palomar Oaks Way
- Palomar Oaks Way / West Oaks Way

Street Segments

Palomar Oaks Way

- Palomar Airport Road to West Oaks Way

2.2 Signalized Intersection Methodology

Signalized intersections were analyzed under AM and PM peak hour conditions. Average vehicle delay was determined utilizing the methodology found in Chapter 19 of the *Highway Capacity Manual 6th Edition (HCM 6),* with the assistance of the *Synchro 10* computer software. The delay values (represented in seconds) are presented for the pre-and-post Project conditions. A more detailed explanation of the methodology is attached in ***Appendix B***.

2.3 Unsignalized Intersection Methodology

Unsignalized intersections were analyzed under AM and PM peak hour conditions. Average vehicle delay was determined based upon the procedures found in Chapter 20 and Chapter 21 of the *HCM 6* with the assistance of the *Synchro 10* computer software. A more detailed explanation of the methodology is also attached in *Appendix B.*

2.4 Roadway Segment Methodology

The City of Carlsbad has historically evaluated street segment LOS by evaluating the volume-to-capacity ratio for peak hour traffic for each direction of travel.

The City has updated the capacity table utilized for the "Volume/Capacity", or "V/C" method with development of the recent *City of Carlsbad Segment LOS Capacity Threshold* table. ***Appendix A*** contains the City of Carlsbad Segment LOS Capacity Threshold table.

3.0 EXISTING CONDITIONS

This section presents existing transportation conditions for street system components identified for analysis.

3.1 Existing Street Network

The following is a description of the major roadways within the study area. ***Figure 3–1*** illustrates existing conditions in the study area in terms of traffic lanes and intersection controls.

Palomar Airport Road is classified as an Arterial Street on the *City of Carlsbad Mobility Element*. Within the study area, Palomar Airport Road is a six-lane divided roadway with Class II bicycle lanes in both directions of travel. The posted speed limit is 35 to 55 mph. On-street parking is not allowed.

Palomar Oaks Way is classified as a Local/Neighborhood Street on the *City of Carlsbad Mobility Element*. Palomar Oaks Way is a private street open to public circulation, and currently constructed as a two-lane undivided roadway. On-street parking is prohibited and there are no bicycle lanes or bus stops.

West Oaks Way is classified as a Local/Neighborhood Street the *City of Carlsbad Mobility Element*. West Oaks Way is constructed as a two-lane undivided roadway but is currently gated and not open to general traffic.

3.2 Existing Traffic Volumes

AM/PM peak hour intersection counts at all study area intersections were commissioned on Wednesday, November 30, 2016 while schools in the area were in session. Peak hour roadway segments volumes were derived from these counts as needed. As noted above, West Oaks Way is constructed but not open to traffic and Palomar Oaks Way / West Oaks Way is not an existing operational intersection. Existing trips on Palomar Oaks Way for analysis of "with Project" scenarios were taken from the count conducted at the adjacent intersection.

Figure 3–2 shows the Existing Traffic Volumes. ***Appendix C*** contains the unadjusted count sheets.

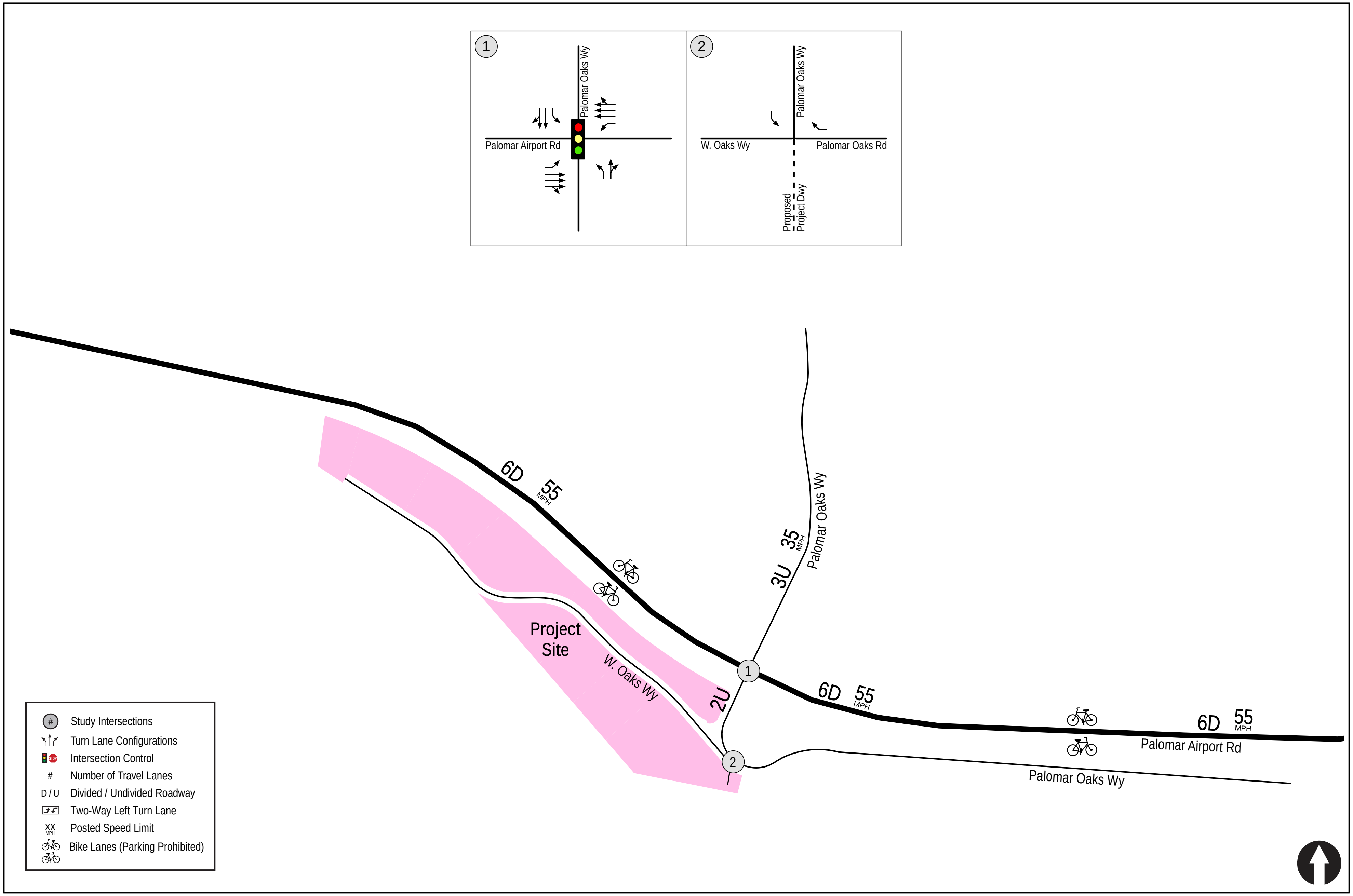

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Figure 3-1

Existing Conditions Diagram

WEST OAKS PROPERTY

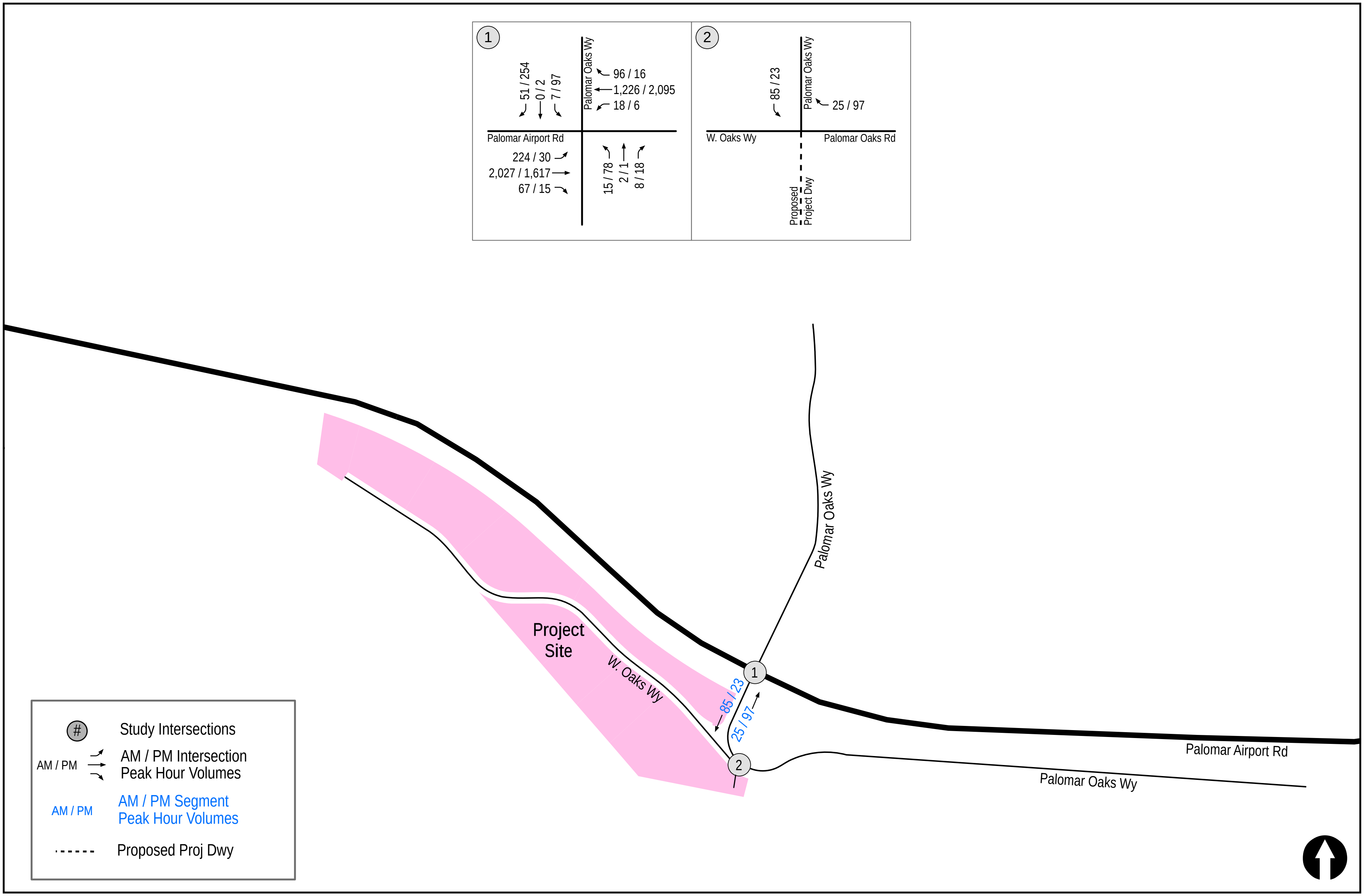

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Figure 3-2

Existing Traffic Volumes

WEST OAKS PROPERTY

4.0 PROPOSED PROJECT

4.1 Trip Generation

The Project proposes the construction of 192 multi-family residential dwelling units. Trip generation estimates for the proposed project were based on the SANDAG's *Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region* (April 2002). Based on the Project's density, the SANDAG "Apartment" rate for multi-family units more than 20 DU/ acre was used.

Table 4–1 tabulates the Project traffic generation. The Project is calculated to generate 1,152 ADT with 18 inbound / 74 outbound trips during the AM peak hour and 73 inbound / 31 outbound trips during the PM peak hour.

TABLE 4–1
PROJECT TRIP GENERATION SUMMARY

Land Use	Quantity	Daily Driveway Trips (ADT)		AM Peak Hour					PM Peak Hour				
		Rate	Volume	Rate	In:Out Split	Volume			Rate	In:Out Split	Volume		
						In	Out	Total			In	Out	Total
Apartment [a]	192 DU	6/DU	1,152	8%	20:80	18	74	92	9%	70:30	73	31	104

Source: *SANDAG (Not So) Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region (April 2002).*

Footnotes:
a. Apartment rate applied to "any multi-family units more than 20 units/acre".

General Notes:
1. ADT = Average Daily Trips

4.2 Trip Distribution

Project traffic was distributed to the street system based on discussions with City staff, using existing traffic counts and other factors such as project access, the proximity of the project to Interstate 5, and potential recreation and retail opportunities.

4.3 Trip Assignment

The Project traffic generation in *Table 4–1* was assigned to the street system based on the trip distribution presented in ***Figure 4–1.*** The resulting assignment of AM/PM peak hour Project volumes is shown on ***Figure 4–2***. Existing + Project traffic volumes are presented on ***Figure 4–3***.

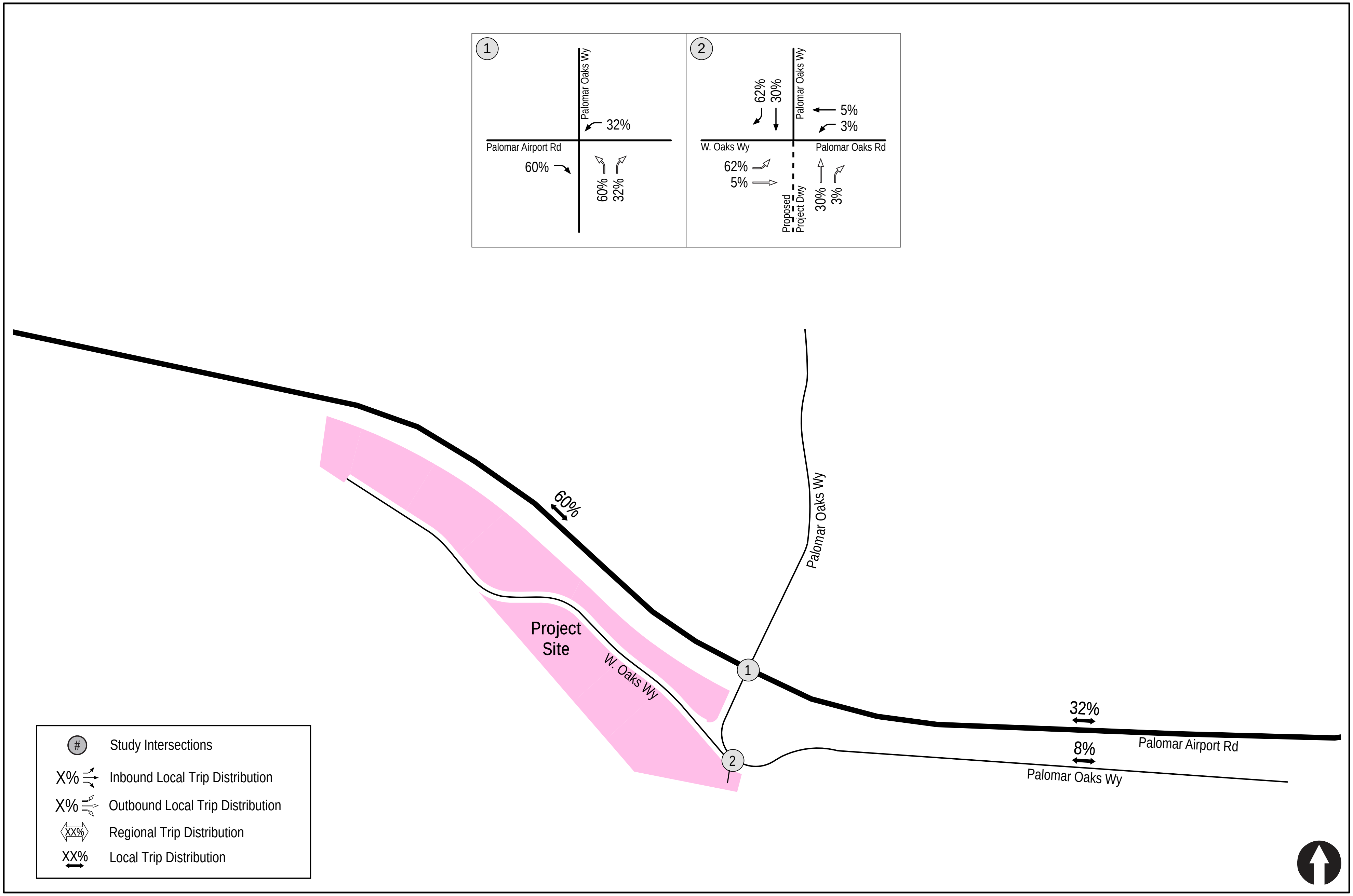

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Figure 4-1

Project Traffic Distribution

WEST OAKS PROPERTY

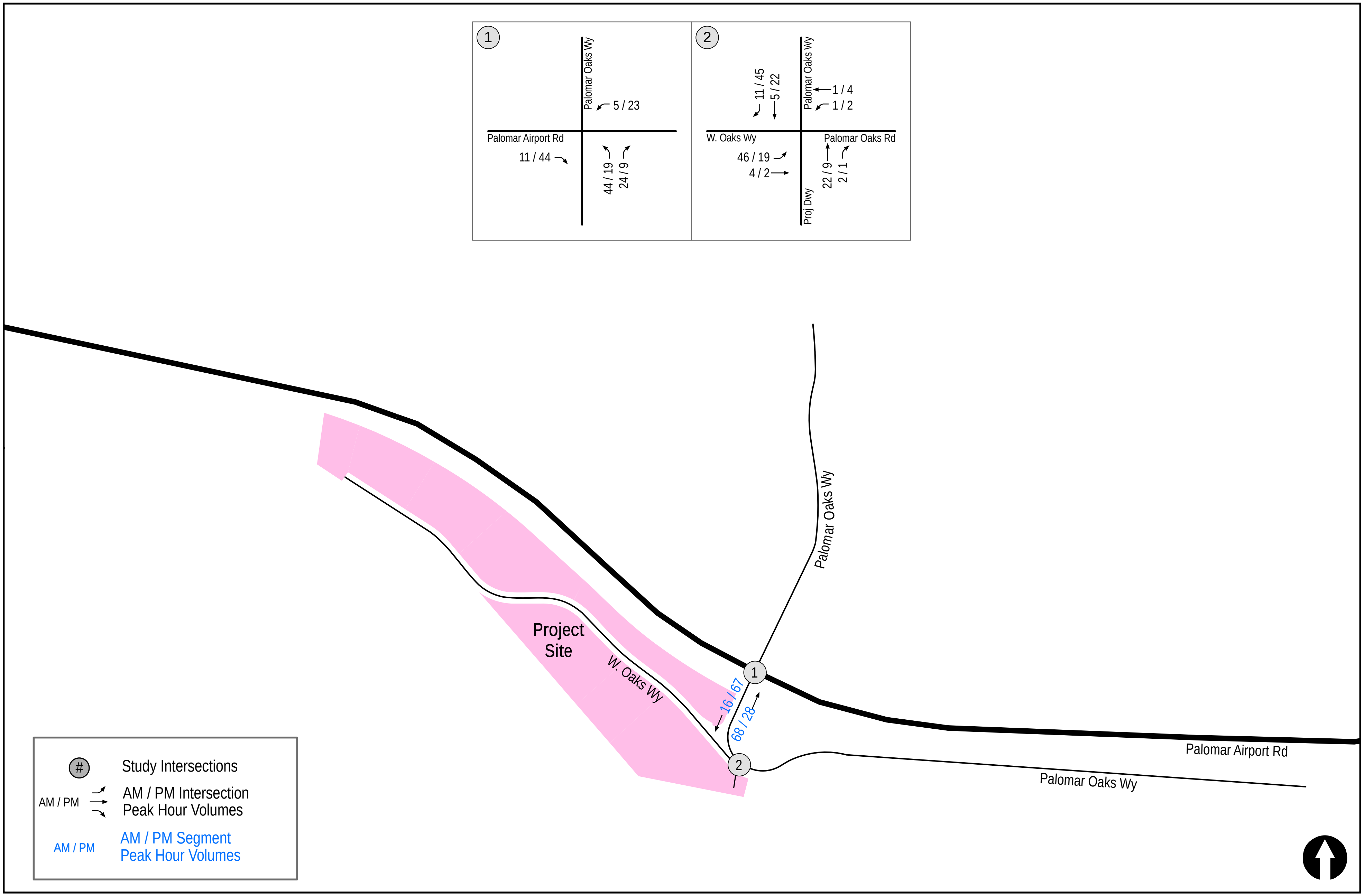

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Figure 4-2

Project Traffic Volumes

WEST OAKS PROPERTY

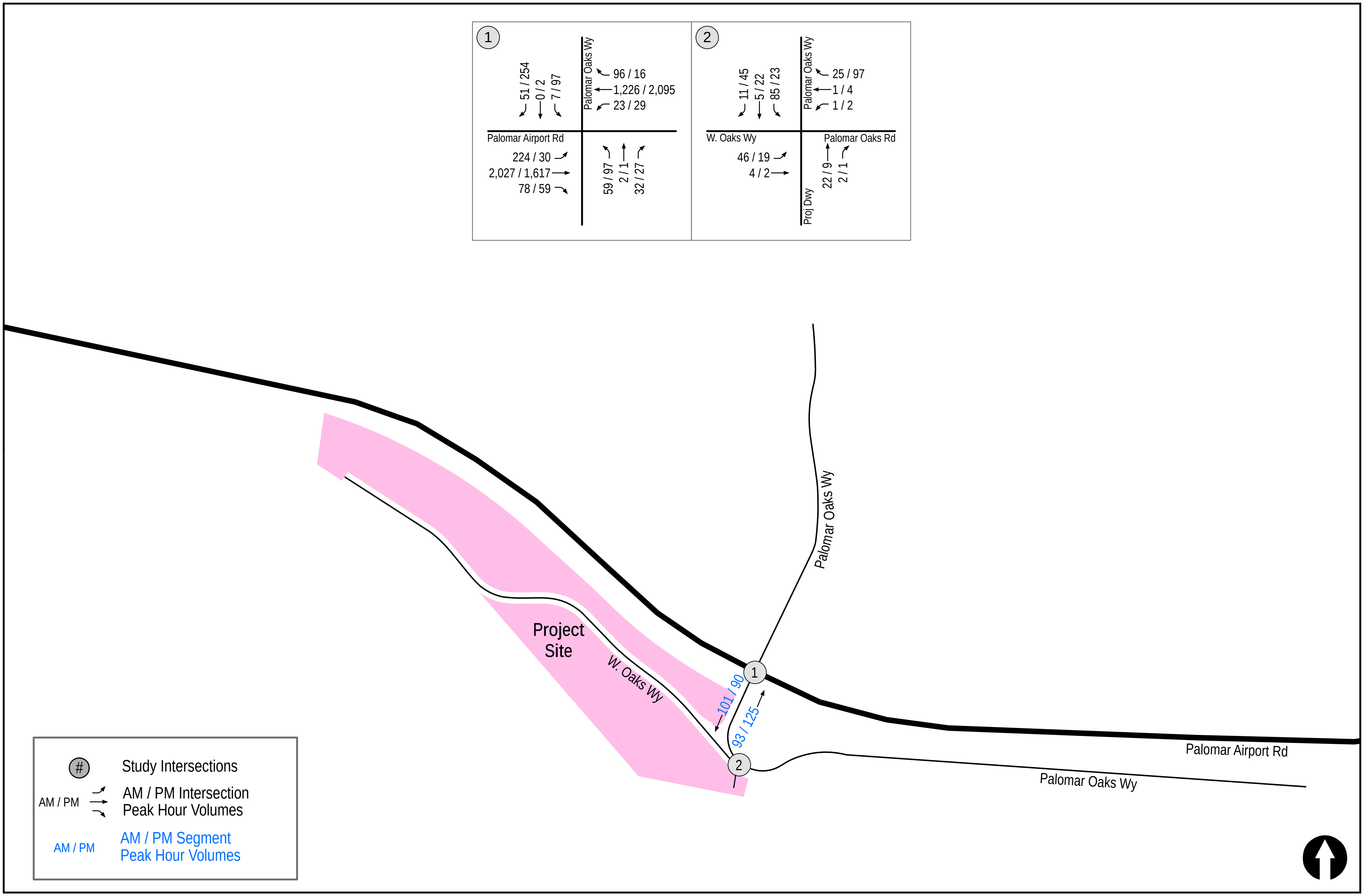

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Figure 4-3

Existing + Project Traffic Volumes

West Oaks Property

5.0 CUMULATIVE CONDITIONS

5.1 Cumulative Projects

To determine Near-Term (Existing + Cumulative) conditions, LLG coordinated with the City of Carlsbad to identify approved or pending projects that will add traffic to the Project study area in the near-term (Project opening day) condition. The following thirteen (13) cumulative projects were identified for inclusion in Near-Term conditions. ***Table 5–1*** lists and describes each cumulative project.

Figure 5–1 shows the total cumulative projects peak hour traffic volumes. ***Figure 5–2*** shows the peak hour traffic volumes for the “Existing + Cumulative Projects” scenario. ***Figure 5–3*** shows the peak hour traffic volumes for the “Existing + Cumulative Projects + Project” scenario.

Individual cumulative project assignments completed by LLG based on available information, as well as supporting information, including cumulative project trip generation and distribution, where available, is included in ***Appendix D***.

TABLE 5–1
CUMULATIVE PROJECTS LIST

Project Name	Description
Robertson Ranch West Village	308 single-family and 322 multi-family dwelling units, 9 acres commercial, 5 acres community facilities
Cantarini Ranch [a, b]	105 single-family and 81 multi-family dwelling units
Holly Springs [a, b]	43 single family dwelling units
Encinas Creek Apartments [a, b]	127 apartments
Quarry Creek	119 single family, 537 multi-family dwelling units
Dos Colinas [a, b]	228 retirement community units, 8 congregate care units, 29 multi-family dwelling units
Bressi Ranch Hotels	239 business hotel rooms
La Costa Town Square	284,400 sf of community shopping center, 129 condo dwelling units, 64 single family dwelling units, 55,000 sf office
Westin Hotel & Timeshare	71 hotel units and 36 timeshare units
Uptown Bressi	90,267 sf commercial buildings and 125 residential units
Aviara Apartments	329-unit apartment complex
Legoland Hotel Phase 2	250-room resort hotel
Marja Acres [a]	252 condos, 46 senior units, 6,000 sf retail, 4,000 sf restaurant

Footnotes:

a. Cumulative project was evaluated and is not expected to contribute a measurable number of trips to the Project study area.
b. Cumulative project requires construction of College Boulevard extension between Cannon Road and El Camino Real.

5.2 Network Conditions

No improvements or changes to study area street facilities are assumed for Near-Term (Existing + Cumulative) conditions. Some of the cumulative projects listed above will require the construction of the planned College Boulevard extension between Cannon Road and El Camino Real. This planned network improvement is located approximately three miles from the Project study area and is anticipated to primarily affect local traffic patterns in the vicinity of College Boulevard, El Camino Real, and Cannon Road. The College Boulevard extension is not expected to have a notable effect on traffic patterns within the study area.

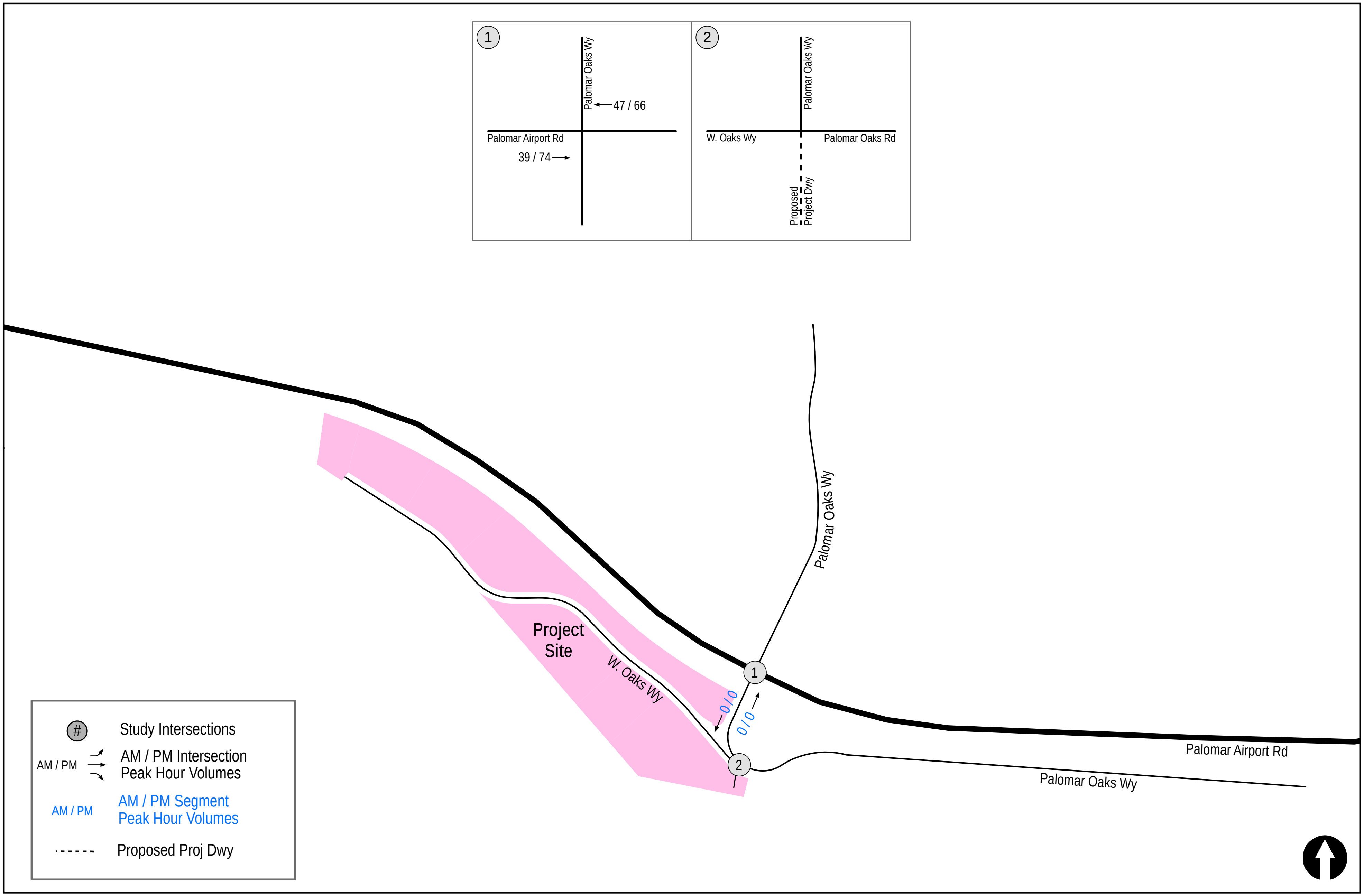

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Figure 5-1

Cumulative Projects Traffic Volumes

WEST OAKS PROPERTY

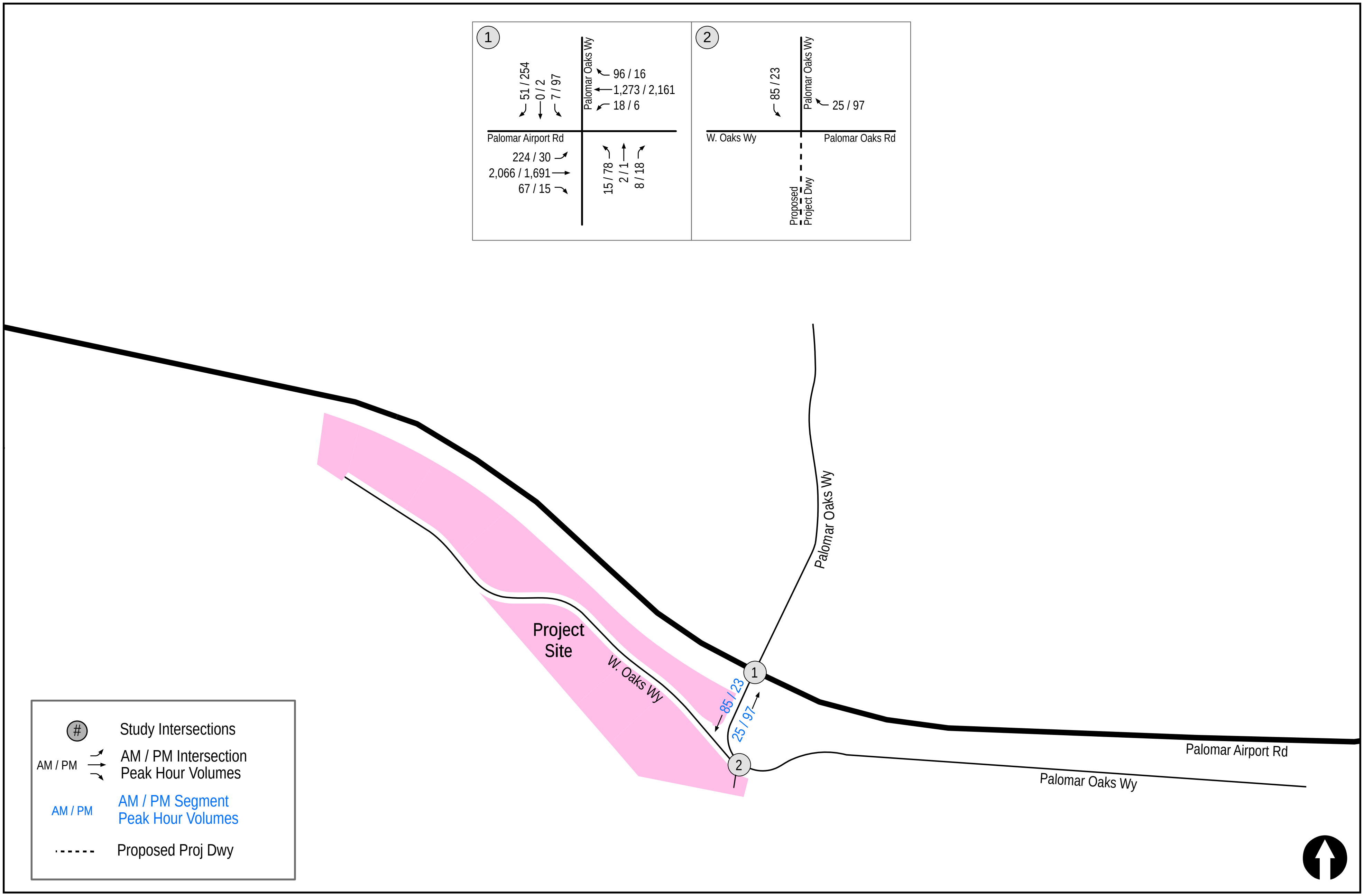

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Figure 5-2

Existing + Cumulative Projects Traffic Volumes

WEST OAKS PROPERTY

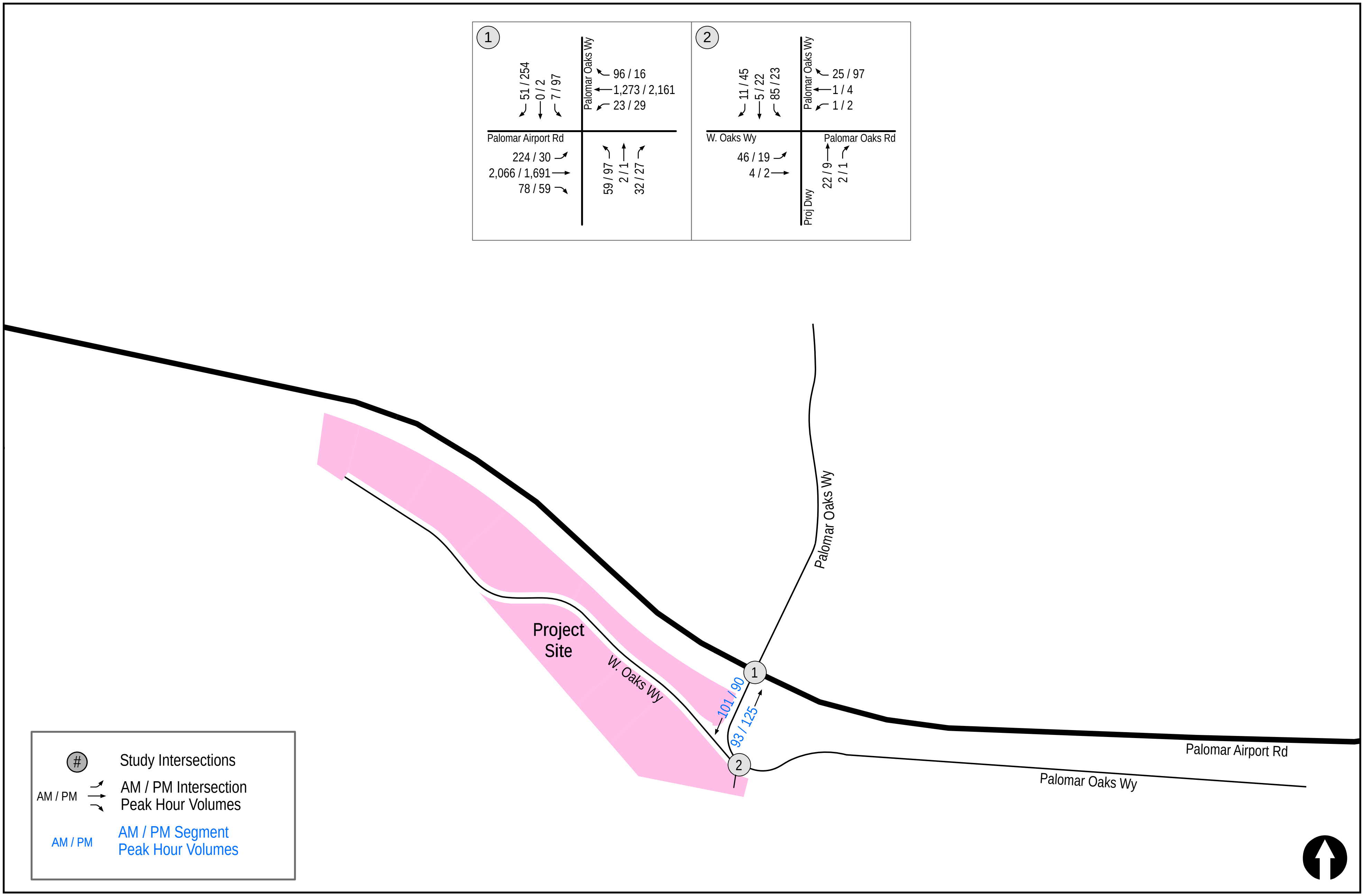

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Figure 5-3

Existing + Cumulative Projects + Project Traffic Volumes

WEST OAKS PROPERTY

6.0 YEAR 2035 CONDITIONS

6.1 Year 2035 Traffic Volumes

Year 2035 traffic volumes along the Palomar Airport Road corridor were forecasted based on the SANDAG Series 12 Traffic Forecast Model developed by Fehr & Peers for use in the Agua Hedionda South Shore Specific Plan traffic study. LLG confirmed with City staff that this model generally contains the most up to date land use forecast within the City of Carlsbad. As the study area for the Agua Hedionda South Shore Specific Plan overlaps with the Project, Year 2035 peak hour volumes were taken directly from the Transportation Impact Analysis, also prepared by Fehr & Peers. These volumes exclude the proposed Agua Hedionda plan itself, which was rejected by ballot measure within the City of Carlsbad. Year 2035 volumes on West Oaks Way and Palomar Oaks Way, south of Palomar Airport Road, were not included in the Agua Hedionda South Shore Specific Plan. These were estimated based on regional growth along Palomar Airport, applied to existing volumes on West Oaks Way.

Figure 6–1 shows the Year 2035 traffic volumes and ***Figure 6–2*** shows the Year 2035 + Project traffic volumes.

Appendix E contains the excerpts from the Fehr & Peers study depicting Year 2035 traffic volumes.

6.2 Year 2035 Roadway Network

The City's planned circulation system includes the following roadway improvements that are expected to be completed by the Year 2035. Although they are not within the Project study area and do not affect the intersection or roadway geometry of study area facilities, they are noted for the broader effect on forecasted traffic volumes for Year 2035.

- College Boulevard Extension – connect roadway from El Camino Real to Cannon Road
- Poinsettia Lane Extension – connect roadway between Cassia Road and El Camino Real
- El Camino Real Widening at Cannon Road – widen intersection to include three northbound through lanes and a separate northbound right-turn lane

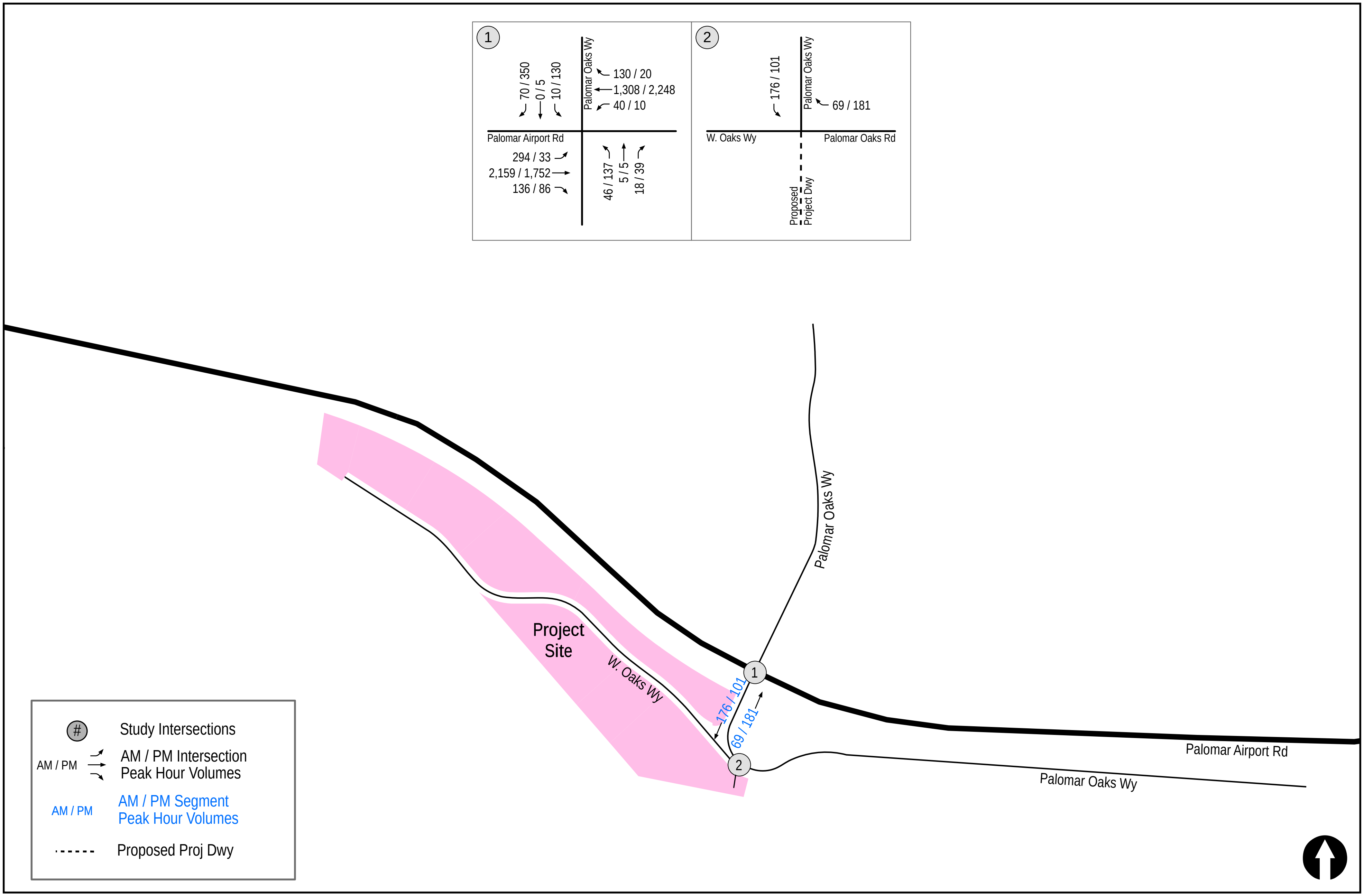

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Figure 6-1

Year 2035 Traffic Volumes

West Oaks Property

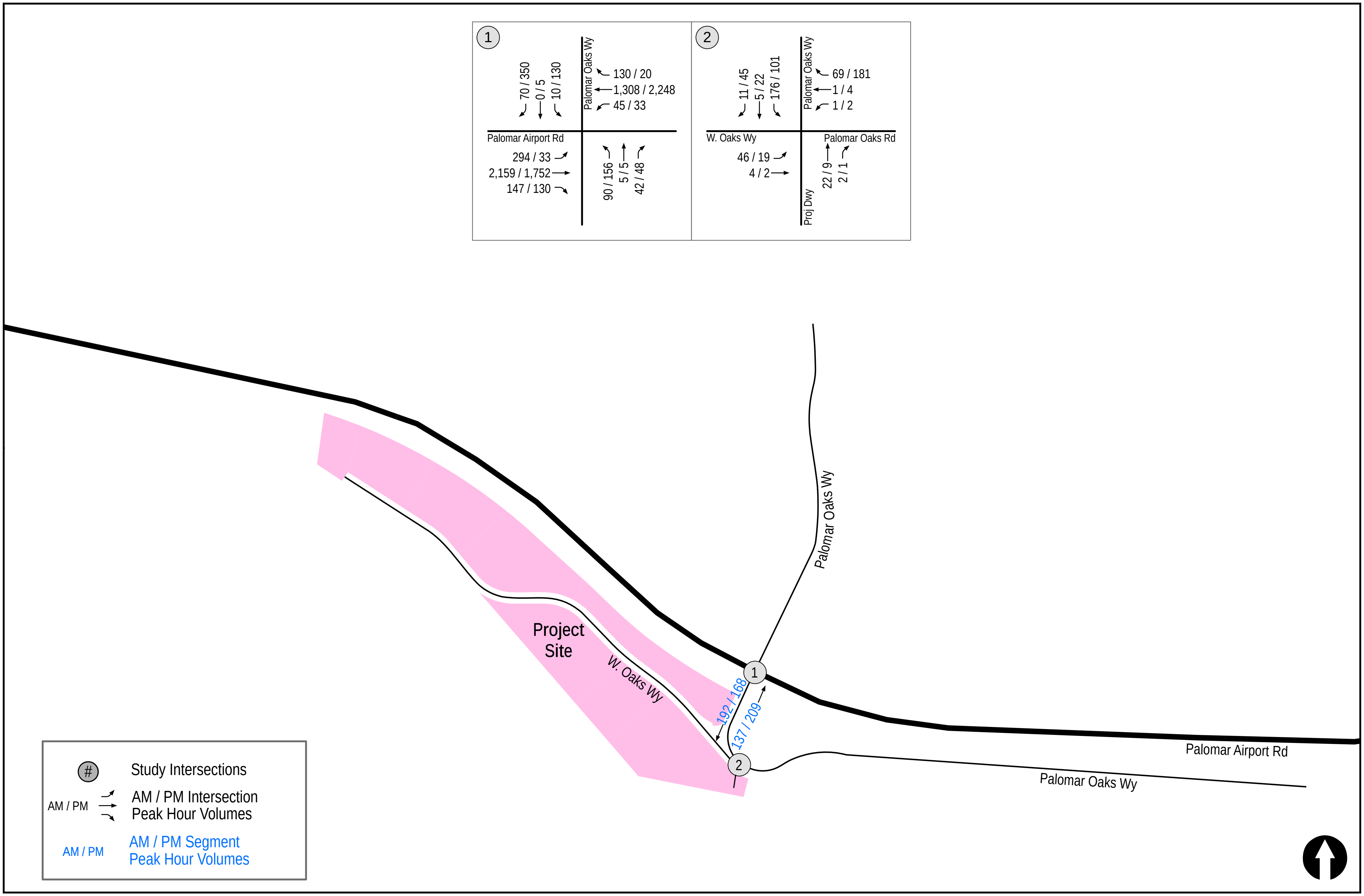

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Figure 6-2

Year 2035 + Project Traffic Volumes

WEST OAKS PROPERTY

7.0 AUTO ANALYSIS PER SANTEC/ITE GUIDELINES (CEQA)

7.1 Background

Based on the approach and methodologies described in *Section 2.0* for the CEQA analysis, the following is an evaluation of the one (1) signalized intersection, one (1) unsignalized intersection, and the one (1) street segment. This analysis is provided for informational purposes only to support other technical studies required by CEQA. West Oaks Way is constructed but gated and not open to traffic. Therefore there are no conflicting turning movements or delay at Palomar Oaks Way / West Oaks Way prior to the Project's opening. This location is evaluated for "with Project" scenarios only.

7.2 Analysis of Existing Conditions

7.2.1 *Signalized and Unsignalized Intersection Analysis*

Table 7–1 shows the results of the intersection capacity analyses conducted for the study intersections under Existing and Existing + Project conditions during the AM and PM peak hours.

Appendix F contains the intersection analysis worksheets for the Existing scenario. ***Appendix G*** contains the intersection analysis worksheets for the Existing + Project scenario.

TABLE 7–1
EXISTING CONDITIONS
INTERSECTION ANALYSIS

Intersection	Control Type	Peak Hour	Existing	Existing + Project	
			Delay[a]	Delay	Δ[b]
1. Palomar Airport Road/ Palomar Oaks Way	Signal	AM PM	9.3 16.9	11.8 18.3	2.5 1.4
2. Palomar Oaks Way/ West Oaks Way	Roundabout	AM PM	—[c] —[c]	3.3 3.3	— —

Footnotes:

a. Average delay expressed in seconds per vehicle.

b. Δ denotes Project induced delay increase.

c. Intersection does not exist without Project. West Oaks Way is constructed but not open to traffic.

SIGNALIZED Delay	SIGNALIZED LOS	UNSIGNALIZED Delay	UNSIGNALIZED LOS
0.0 ≤ 10.0	A	0.0 ≤ 10.0	A
10.1 to 20.0	B	10.1 to 15.0	B
20.1 to 35.0	C	15.1 to 25.0	C
35.1 to 55.0	D	25.1 to 35.0	D
55.1 to 80.0	E	35.1 to 50.0	E
≥ 80.1	F	≥ 50.1	F

7.2.2 *Roadway Segment Analysis*

***Table** 7–2* summarizes the street segment operations under Existing and Existing + Project conditions.

As shown in *Table 7–2,* with the addition of Project traffic Palomar Oaks Way is calculated to continue to operate at acceptable LOS D or better.

Appendix F and *Appendix G* also show peak hour roadway segment volumes for an expanded area used to support other technical studies required by CEQA.

TABLE 7–2
EXISTING CONDITIONS
SEGMENT ANALYSIS

Segment	Capacity [a]	Dir.	Peak Hour	Existing			Existing + Project			
				Volume	LOS[b]	V/C[c]	Volume	LOS	V/C	Δ[d]
Palomar Oaks Way										
Palomar Airport Road to West Oaks Way	560	SB	AM	85	C	0.152	101	C	0.180	0.028
			PM	23	A	0.041	90	C	0.161	0.120
		NB	AM	25	C	0.045	93	C	0.166	0.121
			PM	97	C	0.173	125	D	0.223	0.050

Footnotes:

a. Hourly two-way capacities based on City of Carlsbad Segment LOS Capacity Thresholds.
b. Level of Service
c. Volume to Capacity
d. Δ denotes project induced V/C increase.

LOS	Peak Hour Volume
A	N/A
B	N/A
C	<110
D	<450
E	<560
F	>560

7.3 Analysis of Cumulative Conditions

7.3.1 *Signalized and Unsignalized Intersection Analysis*

Table 7–3 reports the Existing + Cumulative and Existing + Cumulative Projects + Project intersection operations during the AM and PM peak hours.

Appendix H contains the intersection analysis worksheets for the Existing + Cumulative Projects scenario. ***Appendix I*** contains the intersection analysis worksheets for the Existing + Cumulative Projects + Project scenario.

TABLE 7–3
CUMULATIVE CONDITIONS
INTERSECTION ANALYSIS

Intersection	Control Type	Peak Hour	Existing + Cumulative Projects	Existing + Cumulative Projects + Project	
			Delay[a]	Delay	Δ[b]
1. Palomar Airport Road/ Palomar Oaks Way	Signal	AM PM	9.4 17.3	11.9 18.9	2.5 1.6
2. Palomar Oaks Way/ West Oaks Way	Roundabout	AM PM	—[c] —[c]	3.3 3.3	— —

Footnotes:

a. Average delay expressed in seconds per vehicle.
b. Δ denotes Project induced delay increase.
c. Intersection does not exist without Project. West Oaks Way is constructed but not open to traffic.

SIGNALIZED Delay	SIGNALIZED LOS	UNSIGNALIZED Delay	UNSIGNALIZED LOS
0.0 ≤ 10.0	A	0.0 ≤ 10.0	A
10.1 to 20.0	B	10.1 to 15.0	B
20.1 to 35.0	C	15.1 to 25.0	C
35.1 to 55.0	D	25.1 to 35.0	D
55.1 to 80.0	E	35.1 to 50.0	E
≥ 80.1	F	≥ 50.1	F

7.3.2 *Roadway Segment Analysis*

Table 7–4 summarizes the street segment operations under Existing + Cumulative and Existing + Cumulative + Project conditions.

As shown in *Table 7–4,* with the addition of Project traffic Palomar Oaks Way is calculated to continue to operate at acceptable LOS D or better during peak hours.

Appendix H and *Appendix I* also show peak hour roadway segment volumes for an expanded area to support other technical studies required by CEQA.

TABLE 7–4
CUMULATIVE CONDITIONS
SEGMENT ANALYSIS

Segment	Capacity [a]	Dir.	Peak Hour	Existing + Cumulative Projects			Existing + Cumulative Projects + Project			
				Volume	LOS[b]	V/C[c]	Volume	LOS	V/C	Δ[d]
Palomar Oaks Way										
Palomar Airport Road to West Oaks Way	560	SB	AM	85	C	0.152	101	C	0.180	0.028
			PM	23	C	0.041	90	C	0.161	0.120
		NB	AM	25	C	0.045	93	C	0.166	0.121
			PM	97	C	0.173	125	D	0.223	0.050

Footnotes:

a. Hourly two-way capacities based on City of Carlsbad Segment LOS Capacity Thresholds.
b. Level of Service
c. Volume to Capacity.
d. Δ denotes project induced V/C increase.

LOS	Peak Hour Volume
A	N/A
B	N/A
C	<110
D	<450
E	<560
F	>560

7.4 Analysis of Year 2035 Conditions

7.4.1 *Signalized and Unsignalized Intersection Analysis*

Table 7–5 reports the Year 2035 and Year 2035 + Project intersection operations during the AM and PM peak hours.

Appendix J contains the intersection analysis worksheets for the Year 2035 scenario. ***Appendix K*** contains the intersection analysis worksheets for the Year 2035 + Project scenario.

TABLE 7–5
YEAR 2035 CONDITIONS
INTERSECTION ANALYSIS

Intersection	Control Type	Peak Hour	Year 2035	Year 2035 + Project	
			Delay[a]	Delay	Δ[b]
1. Palomar Airport Road/ Palomar Oaks Way	Signal	AM PM	13.5 27.0	16.4 30.4	2.9 3.4
2. Palomar Oaks Way/ West Oaks Way	Roundabout	AM PM	—[c] —[c]	3.7 3.8	— —

Footnotes:

a. Average delay expressed in seconds per vehicle.
b. Δ denotes Project induced delay increase.
c. Intersection does not exist without Project. West Oaks Way is constructed but not open to traffic.

SIGNALIZED Delay	SIGNALIZED LOS	UNSIGNALIZED Delay	UNSIGNALIZED LOS
0.0 ≤ 10.0	A	0.0 ≤ 10.0	A
10.1 to 20.0	B	10.1 to 15.0	B
20.1 to 35.0	C	15.1 to 25.0	C
35.1 to 55.0	D	25.1 to 35.0	D
55.1 to 80.0	E	35.1 to 50.0	E
≥ 80.1	F	≥ 50.1	F

7.4.2 *Roadway Segment Analysis*

Table 7–6 summarizes the street segment operations under Year 2035 and Year 2035 + Project conditions.

As shown in *Table 7–6,* with the addition of Project traffic Palomar Oaks Way is calculated to continue to operate at acceptable LOS D.

Appendix J and *Appendix K* also show peak hour roadway segment volumes for an expanded area to support other technical studies required by CEQA.

TABLE 7–6
YEAR 2035 CONDITIONS
SEGMENT ANALYSIS

Segment	Capacity [a]	Dir.	Peak Hour	Year 2035			Year 2035 + Project			
				Volume	LOS[b]	V/C[c]	Volume	LOS	V/C	Δ[d]
Palomar Oaks Way										
Palomar Airport Road to West Oaks Way	560	SB	AM	176	D	0.314	192	D	0.343	0.029
			PM	101	C	0.180	168	D	0.300	0.120
		NB	AM	69	C	0.123	137	D	0.245	0.122
			PM	181	D	0.323	209	D	0.373	0.050

Footnotes:

a. Hourly two-way capacities based on City of Carlsbad Segment LOS Capacity Thresholds.
b. Level of Service
c. Volume to Capacity.
d. Δ denotes project induced V/C increase.

LOS	Peak Hour Volume
A	N/A
B	N/A
C	<110
D	<450
E	<560
F	>560

8.0 PROJECT ACCESS ALTERNATIVE

8.1 Roundabout (Proposed)

Project access will be via W. Oaks Way, which is the existing west leg of the Palomar Oaks Way/ W. Oaks Way unsignalized tee-intersection. Currently, this west leg is closed via a physical barricade, and the balance of the intersection functions as a defacto curve. The Project proposes to control the tee-intersection with a roundabout. This would be a one-lane roundabout with an approximate inscribed diameter of 100'. Each of the four legs would provide a single lane entry, with design speeds of 25 MPH. A second Project access driveway will form the south leg of the intersection. ***Table 8–1*** restates the near-term and long-term "plus Project" results from *Table 7–3* and *Table 7–5* with the proposed roundabout control.

TABLE 8–1
"PLUS PROJECT" INTERSECTION OPERATIONS
PROPOSED ROUNDABOUT CONTROL

Intersection	Control Type	Peak Hour	Existing + Cumulative + Project		Year 2035 + Project	
			Delay [a]	LOS [b]	Delay	LOS
2. Palomar Oaks Way/ West Oaks Way [c]	Roundabout	AM PM	3.3 3.3	A A	3.7 3.8	A A

Footnotes:

a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. Intersection does not exist without Project. West Oaks Way is constructed but not open to traffic.

UNSIGNALIZED DELAY/LOS THRESHOLDS	
Delay	LOS
0.0 ≤ 10.0	A
10.1 to 15.0	B
15.1 to 25.0	C
25.1 to 35.0	D
35.1 to 50.0	E
≥ 50.1	F

Based on these results, no queuing issues would occur with peak southbound traffic from Palomar Airport Road to Palomar Oaks Way. The maximum AM southbound volumes would be 192 vehicles in one hour (Year 2035 + Project), which averages 3.2 vehicles/minute.

Installation of a roundabout at this intersection provides a range of benefits and is consistent with the goals and policies of the City of Carlsbad Mobility Element, which suggests the use of "innovative design solutions" such as roundabouts to meet mobility, efficiency, connectivity, and safety goals of the transportation system. As compared to the all-way stop-control alternative, discussed below, a roundabout minimizes both overall vehicular delay and prevents unnecessary stops for vehicles on Palomar Oaks Way. This may reduce noise and air quality impacts and fuel consumption by reducing the number of acceleration/deceleration cycles and as such is consistent with the City's Climate Action Plan. The roundabout also provides positive geometric features to manage vehicle speeds as they transition from the higher speed arterial on Palomar Airport Road to the lower speed Palomar Oaks Way.

8.2 All-Way Stop Control (Alternative)

All-way stop-control at Palomar Oaks Way / West Oaks Way was considered as an alternative to the roundabout, although the minor street volumes from the Project would not meet minimum volume warrants. However, the primary movements through the intersection are to/from the adjacent north and east legs, and providing stops signs only on the Project driveways (west and south legs) would be unconventional and not recommended. All-way stop-control of the intersection control would provide a single lane at each approach. ***Table 8–2*** shows a summary of the all-way stop control operations for the same "plus Project" conditions shown above in *Table 8–1* for the roundabout alternative.

TABLE 8–2
"PLUS PROJECT" INTERSECTION OPERATIONS
ALTERNATIVE ALL-WAY STOP CONTROL

Intersection	Control Type	Peak Hour	Existing + Cumulative + Project		Year 2035 + Project	
			Delay [a]	LOS [b]	Delay	LOS
2. Palomar Oaks Way/ West Oaks Way [c]	AWSC [d]	AM PM	7.7 7.3	A A	8.4 8.2	A A

Footnotes:

a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. Intersection does not exist without Project. West Oaks Way is constructed but not open to traffic.
d. AWSC – All-Way Stop Control.

UNSIGNALIZED

DELAY/LOS THRESHOLDS

Delay	LOS
0.0 ≤ 10.0	A
10.1 to 15.0	B
15.1 to 25.0	C
25.1 to 35.0	D
35.1 to 50.0	E
≥ 50.1	F

This table shows that the all-way stop control alternative would also provide a Level of Service of A during both peak hours in both the near-term and long-term conditions with Project traffic volumes. All-way stop control LOS calculations are shown in ***Appendix L.***

8.3 Summary

The Project proposes to serve the Palomar Oaks Way/ West Oaks Way intersection with a roundabout. This results in LOS A operations during peak hours for both near-term and long-term "plus Project" volumes conditions. The proposed roundabout assumes an inscribed diameter of approximately 100-feet. Splitters and lane deflection would be required on each leg, which would result in crosswalks being set back on these legs from the circulatory roadway. Bicycle circulation through the roundabout would occur in the circulatory roadway with bicyclists needing to "take the lane" through the circulatory roadway.

The alternative intersection control evaluated is a conventional all-way stop-control. This allows for a smaller intersection footprint as compared to the roundabout, and provides positive stop control on all approaches for each vehicle. This intersection control also results in LOS A operations during both peak hours for both near-term and long-term "plus Project" volumes conditions. No queuing issues would occur during the AM peak hour with southbound entering vehicles from Palomar Airport Road stopping at Palomar Oaks Way. Pedestrians will have ADA-compliant service at the intersection curb returns, and bicycles will circulate within the roadway. This control type would not meet minimum volume warrants, but would still be recommended as compared to only providing stop-control on the adjacent driveway legs.

End of Report

LINSCOTT LAW & GREENSPAN engineers

TECHNICAL APPENDICES
WEST OAKS

Carlsbad, California
October 28, 2020

LLG Ref. 3-16-2672

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APPENDIX A

CITY OF CARLSBAD SEGMENT LOS CAPACITY THRESHOLD TABLE

City of Carlsbad Segment LOS Capacity Threshold

Segment Capacity Threshold for Arterial Streets

Hourly Volume in Peak Direction

Lanes	Speed Limit	Median	B	C	D	E
1	35	Undivided	**	180	590	740
	35	Divided	**	190	630	780
2	35	Divided	**	520	1390	1540
	45	Divided	**	600	1560	1760
	50	Divided	**	850	1690	1820
	55	Divided	**	1050	1800	1890
3	35	Divided	**	680	2230	2540
	45	Divided	**	2040	2660	2700
	50	Divided	**	2360	2760	2800
	55	Divided	390	2600	2870	2900
4	45	Divided	**	2780	3560	3620

Hourly Volume in Both Direction

Lanes	Speed Limit	Median	B	C	D	E
2	35	Undivided	**	340	1100	1380
	35	Divided	**	360	1170	1450
4	35	Divided	**	970	2580	2860
	45	Divided	**	1120	2890	3260
	50	Divided	**	1580	3130	3380
	55	Divided	**	1950	3340	3500
5	55	Divided	**	3395	4343	4455
6	35	Divided	**	1260	4130	4720
	50	Divided	**	4380	5120	5180
	55	Divided	730	4820	5320	5360
7	45	Divided	**	4483	5785	5878

Annual Average Daily Traffic

Lanes	Speed Limit	Median	B	C	D	E
2	35	Undivided	**	4200	13700	17200
	35	Divided	**	4400	14600	18100
4	35	Divided	**	12100	32200	35800
	45	Divided	**	13900	36200	40800
	50	Divided	**	19700	39200	42200
	55	Divided	**	24400	41700	43800
6	35	Divided	**	15800	51700	59000
	50	Divided	**	54700	63900	64800
	55	Divided	9100	60200	66500	67000

Segment Capacity Threshold for Industrial Streets

Hourly Volume in Peak Direction

Lanes	Speed Limit	Median	B	C	D	E
1	25	Undivided	**	110	450	560
	25	Divided	**	140	610	720
	35	Undivided	**	180	590	740
	35	Divided	**	190	630	780
	40	Undivided	**	216	708	888
	40	Divided	**	228	756	936

Hourly Volume in Both Direction

Lanes	Speed Limit	Median	B	C	D	E
2	25	Undivided	**	200	800	990
	25	Divided	**	250	1080	1270
	35	Undivided	**	340	1100	1380
	35	Divided	**	360	1170	1450
	40	Undivided	**	408	1320	1656
	40	Divided	**	432	1404	1740

Annual Average Daily Traffic

Lanes	Speed Limit	Median	B	C	D	E
2	25	Undivided	**	2200	8900	11000
	25	Divided	**	2800	12000	14100
	35	Undivided	**	4200	13700	17200
	35	Divided	**	4400	14600	18100
	40	Undivided	**	5040	16440	20640
	40	Divided	**	5280	17520	21720

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APPENDIX B

INTERSECTION ANALYSIS METHODOLOGY

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HIGHWAY CAPACITY 6th EDITION MANUAL
LEVEL OF SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS

In the Highway Capacity Manual 6th Edition (HCM 6), Level of Service for signalized intersections is defined in terms of delay. Delay is a measure of driver discomfort, frustration, fuel consumption, and lost travel time. Specifically, Level of Service criteria are stated in terms of the average control delay per vehicle for a 15-minute analysis period. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay.

Delay is a complex measure, and is dependent on a number of variables, including the quality of progression, the cycle length, the green ratio, and the v/c ratio for the lane group or approach in question.

LEVEL OF SERVICE	CONTROLLED DELAY PER VEHICLE (SEC)		
A		≤	10.0
B	10.1	to	20.0
C	20.1	to	35.0
D	35.1	to	55.0
E	55.1	to	80.0
F		>	80.0

Level of Service A describes operations with very low delay, (i.e. less than 10.0 seconds per vehicle). This occurs when progression is extremely favorable, and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.

Level of Service B describes operations with delay in the range of 10.1 to 20.0 seconds per vehicle. This generally occurs with good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average delay.

Level of Service C describes operations with delay in the range of 20.1 to 35.0 seconds per vehicle. These higher delays may result from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear in the level. The number of vehicles stopping is significant at this level, although many still pass through the intersections without stopping.

Level of Service D describes operations with delay in the range of 35.1 to 55.0 seconds per vehicle. At Level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high v/c ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.

Level of Service E describes operations with delay in the range of 55.1 to 80.0 seconds per vehicle. This is considered to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures are frequent occurrences.

Level of Service F describes operations with delay in excess of 80.0 seconds per vehicle. This is considered to be unacceptable to most drivers. This condition often occurs with over-saturation (i.e. when arrival flow rates exceed the capacity of the intersection). It may also occur at high v/c ratios below 1.00 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.

HIGHWAY CAPACITY 6th EDITION MANUAL
LEVEL OF SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS

In the Highway Capacity Manual 6th Edition (HCM 6), Level of Service for unsignalized intersections is determined by the computed or measured control delay and is defined for each minor movement. Level of Service is not defined for the intersection as a whole. Delay is a measure of driver discomfort, frustration, fuel consumption, and lost travel time. The criteria are given in the following the table, and are based on the average control delay for any particular minor movement.

LEVEL OF SERVICE	AVERAGE CONTROL DELAY SEC/VEH			EXPECTED DELAY TO MINOR STREET TRAFFIC
A	0.0	≤	10.0	Little or no delay
B	10.1	to	15.0	Short traffic delays
C	15.1	to	25.0	Average traffic delays
D	25.1	to	35.0	Long traffic delays
E	35.1	to	50.0	Very long traffic delays
F		>	50.0	Severe congestion

Level of Service F exists when there are insufficient gaps of suitable size to allow a side street demand to safely cross through a major street traffic stream. This Level of Service is generally evident from extremely long control delays experienced by side-street traffic and by queuing on the minor-street approaches. The method, however, is based on a constant critical gap size; that is, the critical gap remains constant no matter how long the side-street motorist waits. LOS F may also appear in the form on side-street vehicles selecting smaller-than-usual gaps. In such cases, safety may be a problem, and some disruption to the major traffic stream may result. It is important to note that LOS F may not always result in long queues but may result in adjustments to normal gap acceptance behavior, which are more difficult to observe in the field than queuing.

In most cases at Two-Way Stop Controlled (TWSC) intersections, the critical movement is the minor-street left-turn movement. As such, the minor-street left-turn movement can generally be considered the primary factor affecting overall intersection performance. The lower threshold for LOS F is set at 50 seconds of delay per vehicle. There are many instances, particularly in urban areas, in which the delay equations will predict delays of 50 seconds (LOS F) or more for minor-street movements under very low volume conditions on the minor street (less than 25 vehicle/hour). Since the first term of the equation is a function only of the capacity, the LOS F threshold of 50 sec/vehicle is reached with a movement capacity of approximately 85 vehicle/hour or less.

This procedure assumes random arrivals on the major street. For a typical four-lane arterial with average daily traffic volumes in the range of 15,000 to 20,000 vehicles per day (peak hour, 1,500 to 2,000 vehicle/hour), the delay equation used in the TWSC capacity analysis procedure will predict 50 seconds of delay or more (LOS F) for many urban TWSC intersections that allow minor-street left-turn movements. **The LOS F threshold will be reached regardless of the volume of minor-street left-turn traffic.** Not-withstanding this fact, most low-volume minor-street approaches would not meet any of the volume or delay warrants for signalization of the *Manual on Uniform Traffic Control Devices* (MUTCD) since the warrants define an asymptote at 100 vehicle/hour on the minor approach. As a result, many public agencies that use the HCM 6 Level of Service thresholds to determine the design adequacy of TWSC intersections may be forced to eliminate the minor-street left-turn movement, even when the movement may not present any operational problem, such as the formation of long queues on the minor street or driveway approach.

APPENDIX C

EXISTING TRAFFIC COUNT SHEETS

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Turn Count Summary

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

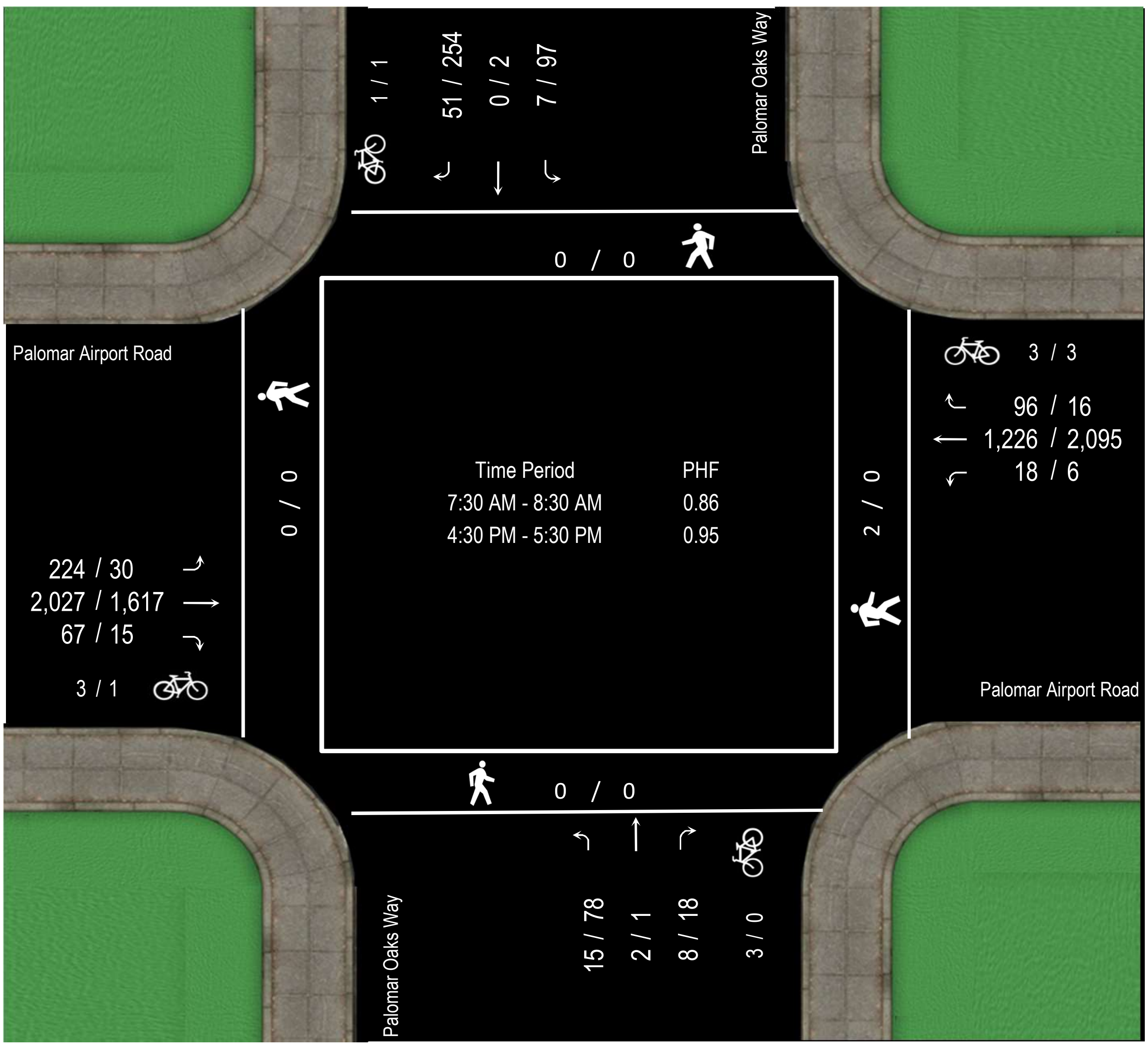
Location: Palomar Airport Road @ Palomar Oaks Way

Date of Count: *Wednesday, November 30, 2016*

Analysts: *LV/CD*

Weather: *Sunny*

AVC Proj No: *16-0598*



Linscott Law & Greenspan engineers

Vehicular Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136

Location: Palomar Airport Road @ Palomar Oaks Way

AM Period (7:00 AM - 9:00 AM)

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
7:00 AM	7	0	4	16	234	6	3	1	4	10	274	41	600
7:15 AM	9	0	1	21	234	3	3	1	1	10	369	46	698
7:30 AM	8	0	2	19	279	3	2	0	5	10	460	44	832
7:45 AM	12	0	2	28	334	9	1	1	4	21	601	79	1,092
8:00 AM	20	0	2	24	299	3	3	1	4	19	515	56	946
8:15 AM	11	0	1	25	314	3	2	0	2	17	451	45	871
8:30 AM	12	0	5	25	280	3	2	1	1	8	438	53	828
8:45 AM	8	2	5	22	312	2	1	2	3	11	401	45	814
Total	87	2	22	180	2,286	32	17	7	24	106	3,509	409	6,681

AM Intersection Peak Hour : **7:30 AM - 8:30 AM** Intersection PHF : **0.86**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	51	0	7	96	1,226	18	8	2	15	67	2,027	224	3,741
PHF	0.64	#####	0.88	0.86	0.92	0.50	0.67	0.50	0.75	0.80	0.84	0.71	0.86
Movement PHF		0.66			0.90			0.78			0.83		0.86

PM Period (4:00 PM - 6:00 PM)

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
4:00 PM	69	0	22	3	470	1	4	0	18	3	390	12	992
4:15 PM	49	2	13	4	457	1	3	2	9	3	332	13	888
4:30 PM	70	0	23	4	533	2	7	0	16	3	410	8	1,076
4:45 PM	63	2	19	6	476	3	3	1	20	3	428	9	1,033
5:00 PM	90	0	32	4	554	1	7	0	24	6	390	9	1,117
5:15 PM	31	0	23	2	532	0	1	0	18	3	389	4	1,003
5:30 PM	30	0	16	0	396	1	4	0	11	1	340	5	804
5:45 PM	24	0	9	1	380	3	1	0	12	2	314	6	752
Total	426	4	157	24	3,798	12	30	3	128	24	2,993	66	7,665

PM Intersection Peak Hour : **4:30 PM - 5:30 PM** Intersection PHF : **0.95**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	254	2	97	16	2095	6	18	1	78	15	1617	30	4229
PHF	0.71	0.25	0.758	0.667	0.945	0.5	0.643	0.25	0.813	0.625	0.945	0.833	0.95
Movement PHF		0.72			0.95			0.78			0.94		0.95

APPENDIX D

CUMULATIVE PROJECTS TRAFFIC VOLUMES AND INFORMATION

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INTERSECTION	DIRECTION	TOTAL CUMULATIVE						Agua Hedionda NT Projects [1]						Westin Hotel LLG #2418					
		Ram	**R**pm	**T**am	**T**pm	**L**am	**L**pm	**R**am	**R**pm	**T**am	**T**pm	**L**am	**L**pm	**R**am	**R**pm	**T**am	**T**pm	**L**am	**L**pm
7 Palomar Airport Rd / Palomar Oaks Way	**S**b	0	0	0	0	0	0												
	Wb	0	0	47	66	0	0			26	25					3	4		
	Nb	0	0	0	0	0	0												
	Eb	0	0	39	74	0	0			18	28					2	4		
8 Palomar Oaks Way / W Oaks Way	**S**b	0	0	0	0	0	0			0	0					0	0		
	Wb	0	0	0	0	0	0												
	Nb	0	0	0	0	0	0			0	0					0	0		
	Eb	0	0	0	0	0	0												

1. Includes the following developments
Robertson Ranch
Cantarini Ranch
Holly Springs
Quarry Creek
Dos Colinas
North 40
Bressi Ranch Hotels
La Costa Town Square

INTERSECTION	DIRECTION	Uptown Bressi						Legoland Hotel 2						Marja Acres					
		Ram	Rpm	Tam	Tpm	Lam	Lpm	Ram	Rpm	Tam	Tpm	Lam	Lpm	Ram	Rpm	Tam	Tpm	Lam	Lpm
7 Palomar Airport Rd / Palomar Oaks Way	Sb							0	0	0	0	0	0						
	Wb			15	34			0	0	3	3	0	0						
	Nb							0	0	0	0	0	0						
	Eb			17	38			0	0	2	4	0	0						

No trips to study area

8 Palomar Oaks Way / W Oaks Way	Sb			0	0					0	0								
	Wb																		
	Nb			0	0					0	0								
	Eb																		

1. Includes the following developments
Robertson Ranch
Cantarini Ranch
Holly Springs
Quarry Creek
Dos Colinas
North 40
Bressi Ranch Hotels
La Costa Town Square

4 PROJECT DESCRIPTION

Merlin Entertainment Group operates LEGOLAND California and LEGOLAND Hotel in the City of Carlsbad. Merlin Entertainment Group is proposing to construct a 250 room hotel on the existing parking lot adjacent to the Sea Life Aquarium. The project site plan is provided in **Figure 4-1a** and **Figure 4-1b.**

Parking for the new LEGOLAND Hotel will be provided in a dedicated parking lot located within the existing ADA parking lot. The existing ADA parking lot will be relocated. A detailed assessment of existing hotel parking demand determined sufficient capacity is available to meet the future demand of the new hotel. Details of the parking assessment is provided in Chapter 9 of this report. Access to the new hotel will be provided either through the main park gates from LEGOLAND Drive or through the hotel access road off The Crossings. Parking and circulation patterns for the new hotel are illustrated in **Figure 4-2**.

4.1 Trip Generation

To determine the trips forecast to be generated by the proposed hotel land use, SANDAG trip generations rates (April 2002) were utilized in accordance with SANTEC/ITE Traffic Study Guidelines. **Table 4-1** represents the trip generation rates used for the proposed hotel and summarizes the forecast generated by the proposed project.

As shown on Table 4-1, a typical 250 room resort hotel is forecast to generate approximately 2,000 daily trips, which includes approximately 100 AM peak hour trips and approximately 140 PM peak hour trips.

TABLE 4-1: FORECAST PROJECT GENERATED TRIPS

	Daily Trips	AM Peak Hour (7:30 to 8:30)			PM Peak Hour (4:15-5:15)		
		Total	Inbound	Outbound	Total	Inbound	Outbound
Trip Rates							
Resort Hotel	8/Room	5%	60%	40%	7%	40%	60%
Forecast Trips							
250 Room Resort Hotel	2,000	100	60	40	140	56	84

Source: *SANDAG "Not so Brief Guide" – April 2002*

It should be noted that co-locating the hotel on site with the theme park will result in lower trip generation rates than similar resort hotels in the Carlsbad area. Guests of the LEGOLAND Hotel choose to stay at the resort for the convenience and LEGOLAND experience. Therefore, most visitors do not leave the hotel or park during the day to travel to other destinations. The presence of the hotel also reduces the number of park trips as those who would typically choose to stay at other hotels in the area choose to stay at the LEGOLAND Hotel instead.

Legoland Hotel 2

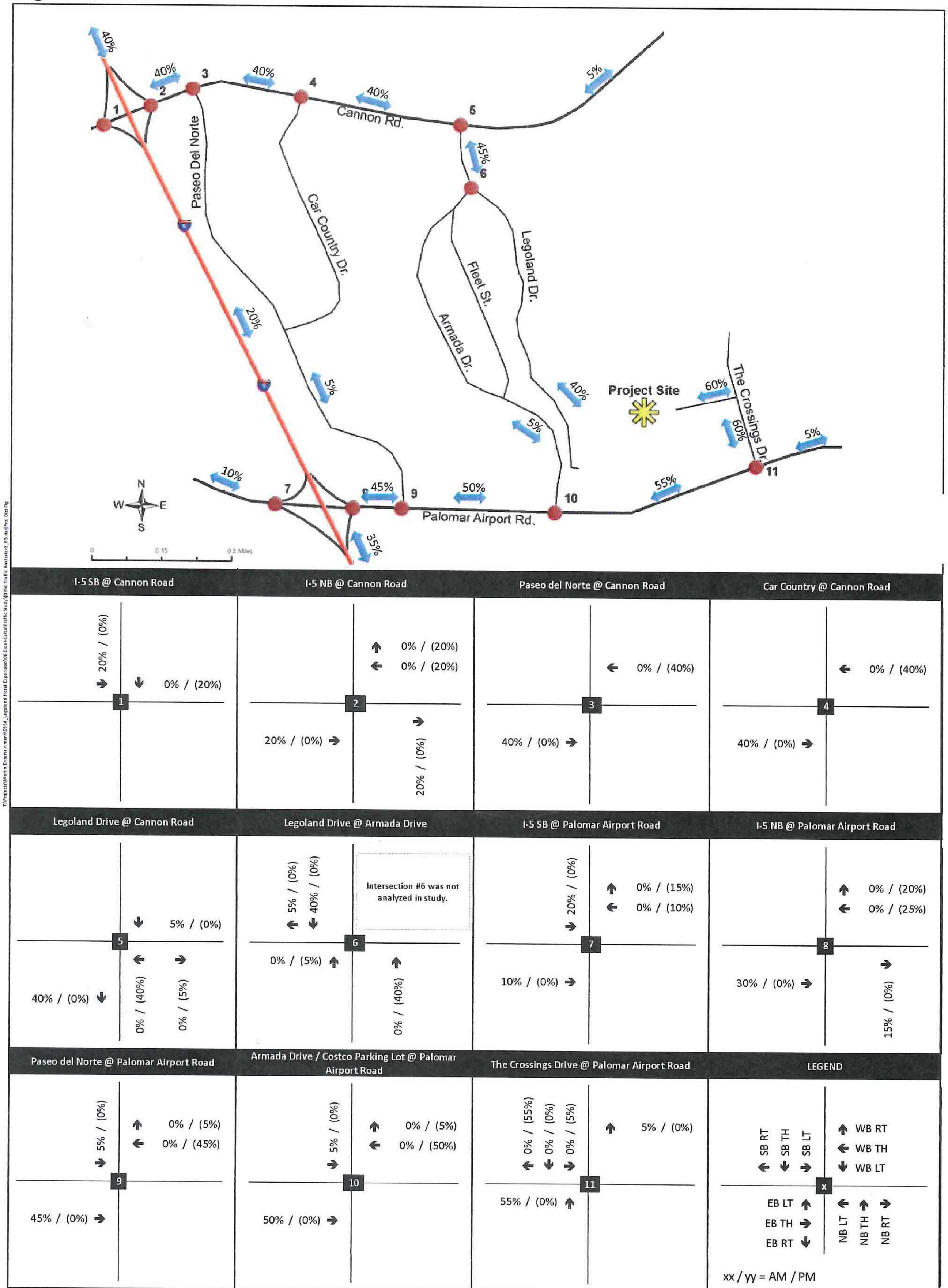


Figure 4-3
Project Trip Distribution

TABLE 3-1

Project Trip Generation Table

PROPOSED RESIDENTIAL

Use	Amount	Trip Rate*	ADT	AM						PM					
				Peak %	Vol.	In %	Out%	In	Out	Peak %	Vol.	In %	Out%	In	Out
Condominiums	125 DU	8 /DU	**1,000**	8%	**80**	20%	80%	**16**	**64**	10%	**100**	70%	30%	**70**	**30**

*Sandag Traffic Generation Rates, April 2002

Note:
DU= Dwelling Unit
ADT = Average Daily Traffic

PROPOSED RETAIL

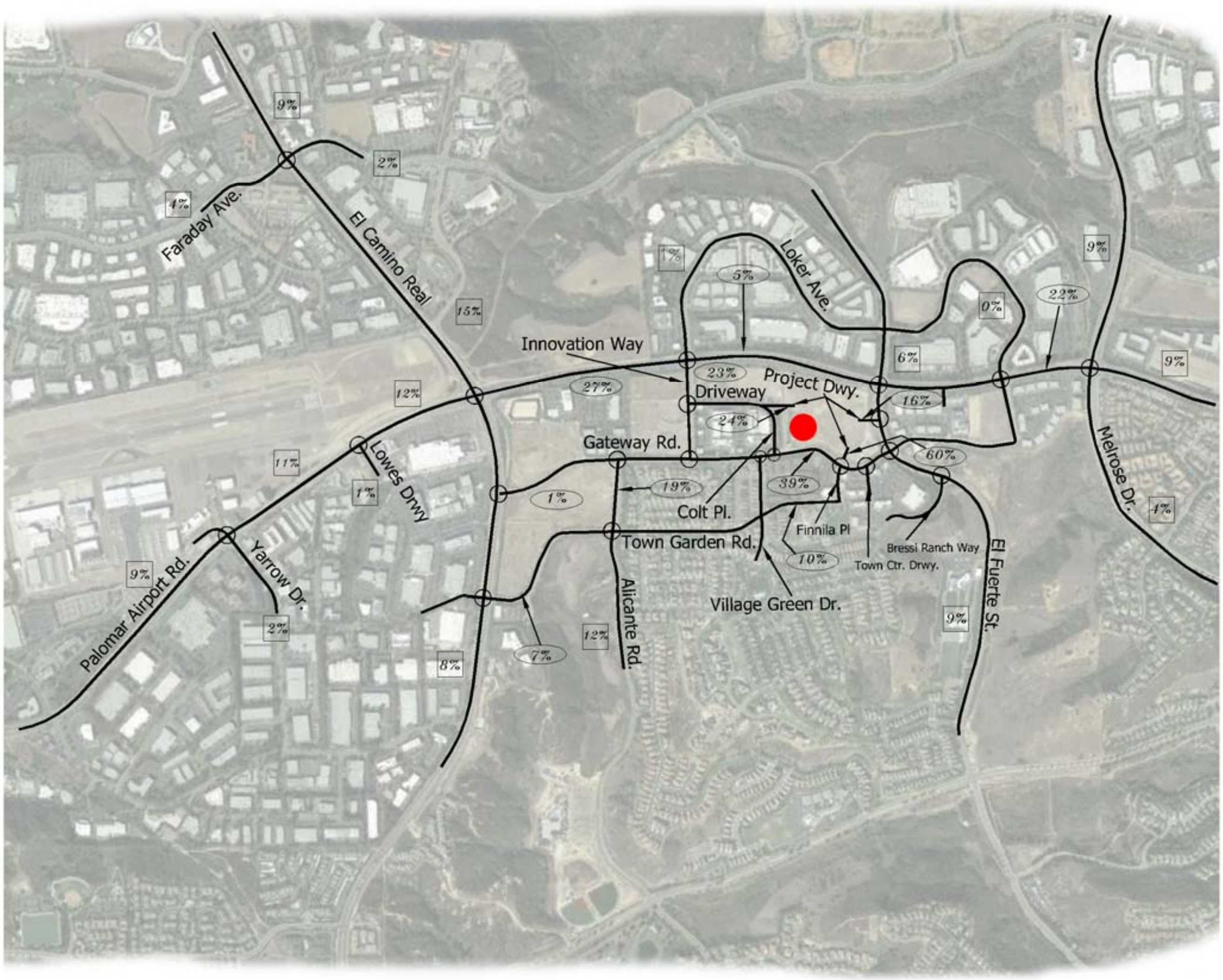
Use	Amount	Trip Rate*	ADT	AM						PM					
				Peak %	Vol.	In %	Out%	In	Out	Peak %	Vol.	In %	Out%	In	Out
Community Shopping Center	100,174 KSF	80 /KSF	**8,014**	4%	**321**	60%	40%	**192**	**128**	10%	**801**	50%	50%	**401**	**401**
Retail Total			**8,014**		**321**			**192**	**128**		**801**			**401**	**401**

*Sandag Traffic Generation Rates, April 2002

Note:
KSF=1,000 Square Feet

COMBINED TRIP GENERATION

Project	ADT	AM					PM				
			Vol.		In	Out		Vol.		In	Out
TOTAL PROPOSED RESIDENTIAL	**1,000**		**80**		**16**	**64**		**100**		**70**	**30**
TOTAL PROPOSED RETAIL	**8,014**		**321**		**192**	**128**		**801**		**401**	**401**
COMBINED TOTAL	**9,014**		**401**		**208**	**192**		**901**		**471**	**431**



#% = Cordon Count Adds to 85% External Trips. 15% Internal to Bressi Ranch Planned Industrial and Mixed Use.

#% = Project Only Internal Percentages within Cordon, do not add to 85%

= Project Site

N
NO SCALE

FIGURE 3-2

Project Distribution Percentages

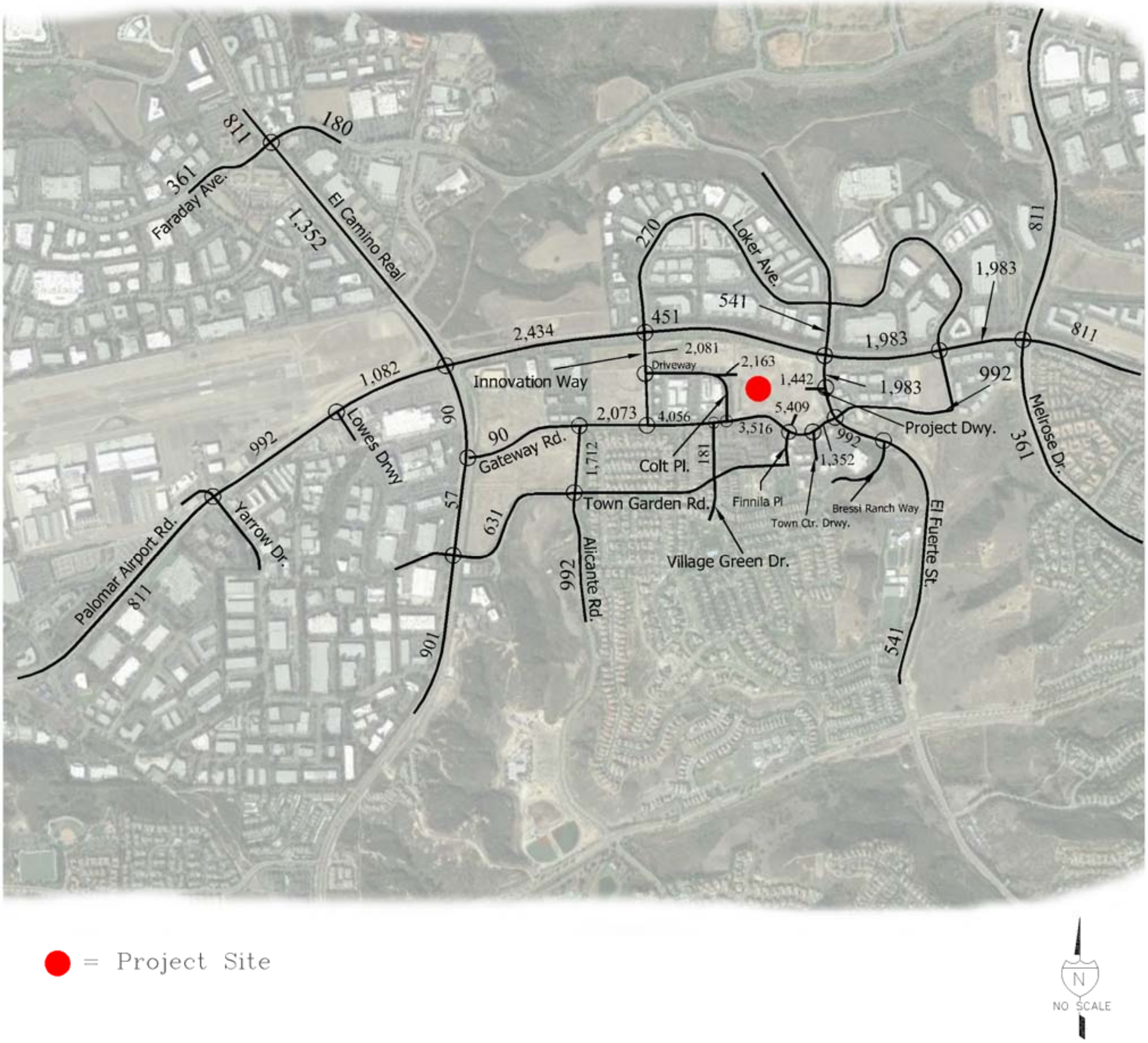


FIGURE 3-3

Project Only Average Daily Traffic

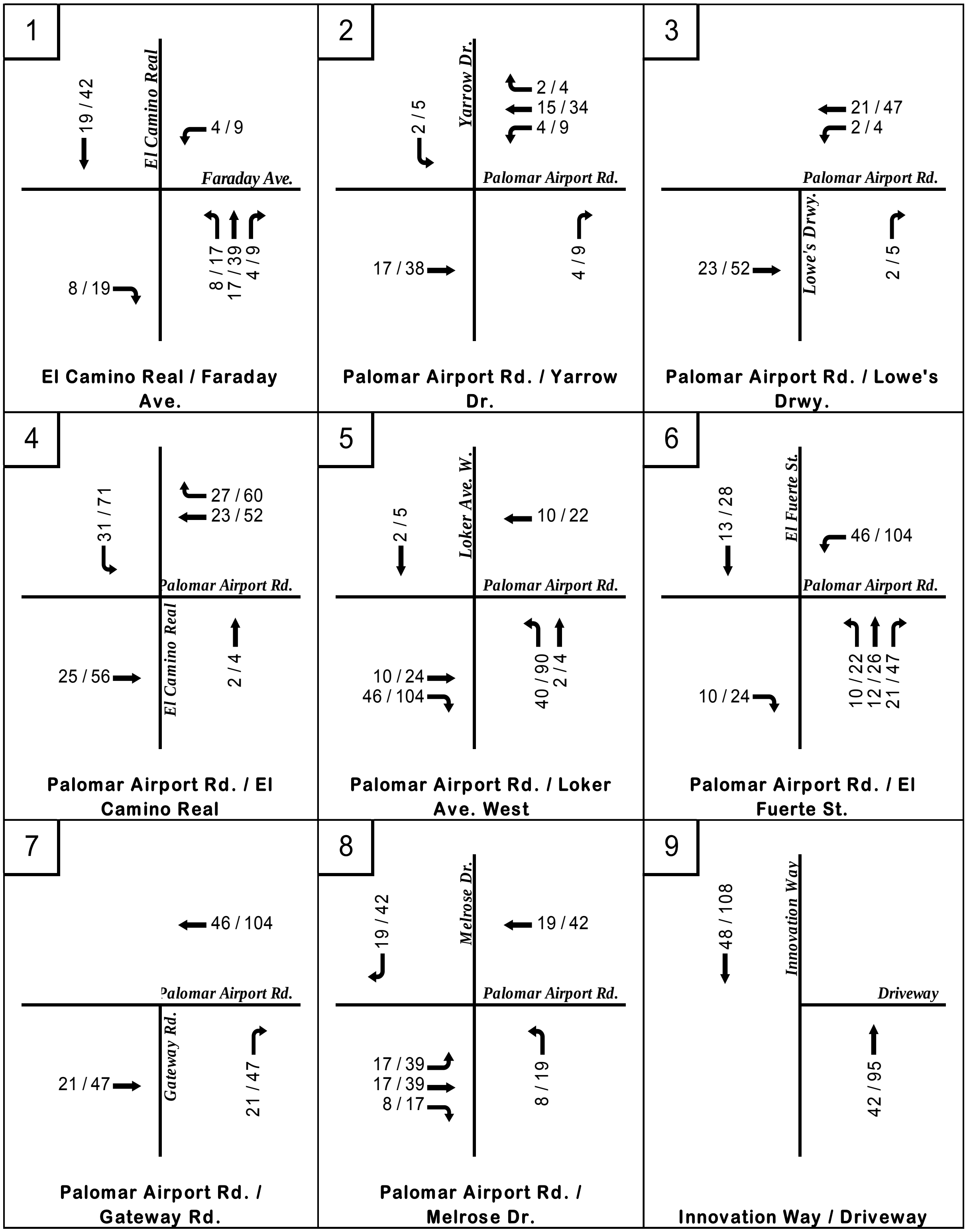


FIGURE 3-4

Project Only AM / PM Peak Hour Traffic

APPENDIX E

YEAR 2035 TRAFFIC VOLUME DATA

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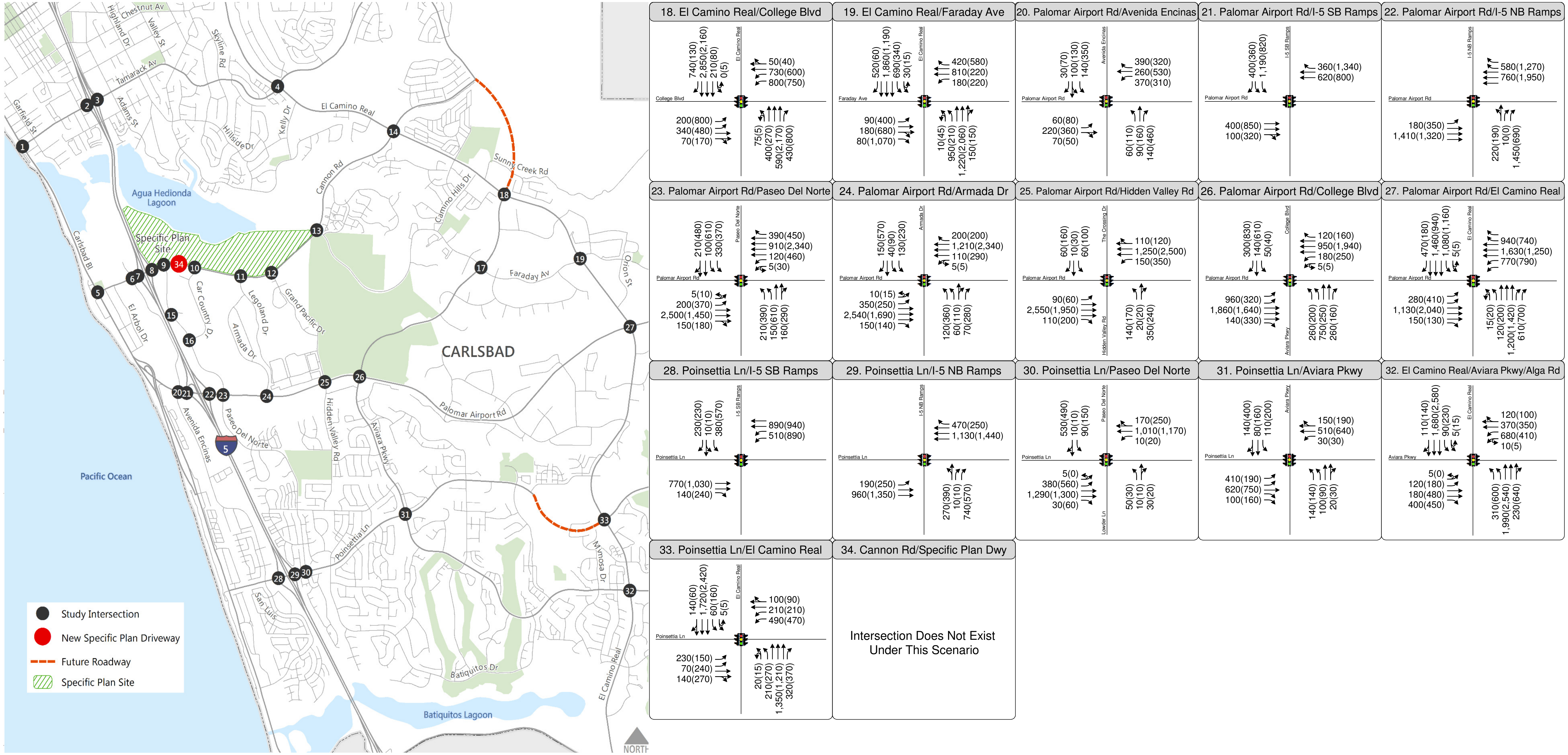

Figure 13
Peak Hour Traffic Volumes and Lane Configurations
2035 No Specific Plan Conditions

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APPENDIX F

HCM ANALYSIS WORKSHEETS – EXISTING

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	224	2027	67	18	1226	96	15	2	8	7	0	51
Future Volume (veh/h)	224	2027	67	18	1226	96	15	2	8	7	0	51
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	255	2303	76	20	1393	109	17	2	9	8	0	58
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	311	3632	119	41	2722	213	144	19	86	187	115	103
Arrive On Green	0.17	0.72	0.72	0.02	0.56	0.56	0.06	0.06	0.06	0.06	0.00	0.06
Sat Flow, veh/h	1781	5078	167	1781	4829	378	1345	296	1334	1404	1777	1585
Grp Volume(v), veh/h	255	1541	838	20	982	520	17	0	11	8	0	58
Grp Sat Flow(s),veh/h/ln	1781	1702	1840	1781	1702	1802	1345	0	1630	1404	1777	1585
Q Serve(g_s), s	9.5	16.1	16.3	0.8	12.1	12.1	0.9	0.0	0.4	0.4	0.0	2.4
Cycle Q Clear(g_c), s	9.5	16.1	16.3	0.8	12.1	12.1	3.3	0.0	0.4	0.8	0.0	2.4
Prop In Lane	1.00		0.09	1.00		0.21	1.00		0.82	1.00		1.00
Lane Grp Cap(c), veh/h	311	2435	1316	41	1919	1016	144	0	105	187	115	103
V/C Ratio(X)	0.82	0.63	0.64	0.49	0.51	0.51	0.12	0.00	0.10	0.04	0.00	0.57
Avail Cap(c_a), veh/h	663	3124	1689	143	2130	1128	412	0	430	467	469	419
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.2	5.1	5.1	33.1	9.2	9.2	32.7	0.0	30.2	30.6	0.0	31.1
Incr Delay (d2), s/veh	5.3	0.3	0.5	8.6	0.2	0.4	0.4	0.0	0.4	0.1	0.0	4.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.3	3.7	4.1	0.4	3.8	4.1	0.3	0.0	0.2	0.1	0.0	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.6	5.4	5.6	41.7	9.4	9.6	33.1	0.0	30.6	30.7	0.0	35.9
LnGrp LOS	C	A	A	D	A	A	C	A	C	C	A	D
Approach Vol, veh/h		2634			1522			28			66	
Approach Delay, s/veh		8.1			9.9			32.1			35.3	
Approach LOS		A			A			C			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.1	53.5		8.9	16.5	43.1		8.9				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.5	62.9		18.1	25.5	42.9		18.1				
Max Q Clear Time (g_c+I1), s	2.8	18.3		4.4	11.5	14.1		5.3				
Green Ext Time (p_c), s	0.0	30.7		0.2	0.6	13.1		0.0				

Intersection Summary			
HCM 6th Ctrl Delay			9.3
HCM 6th LOS			A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	1617	15	6	2095	16	78	1	18	97	2	254
Future Volume (veh/h)	30	1617	15	6	2095	16	78	1	18	97	2	254
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	34	1838	17	7	2381	18	89	1	20	110	2	289
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	57	3242	30	16	3129	24	130	17	335	372	391	349
Arrive On Green	0.03	0.62	0.62	0.01	0.60	0.60	0.22	0.22	0.22	0.22	0.22	0.22
Sat Flow, veh/h	1781	5217	48	1781	5228	39	1088	76	1521	1391	1777	1585
Grp Volume(v), veh/h	34	1199	656	7	1550	849	89	0	21	110	2	289
Grp Sat Flow(s),veh/h/ln	1781	1702	1862	1781	1702	1863	1088	0	1597	1391	1777	1585
Q Serve(g_s), s	1.7	18.6	18.6	0.4	30.3	30.4	4.2	0.0	0.9	6.1	0.1	15.7
Cycle Q Clear(g_c), s	1.7	18.6	18.6	0.4	30.3	30.4	19.9	0.0	0.9	7.1	0.1	15.7
Prop In Lane	1.00		0.03	1.00		0.02	1.00		0.95	1.00		1.00
Lane Grp Cap(c), veh/h	57	2115	1157	16	2038	1115	130	0	352	372	391	349
V/C Ratio(X)	0.60	0.57	0.57	0.44	0.76	0.76	0.68	0.00	0.06	0.30	0.01	0.83
Avail Cap(c_a), veh/h	128	2317	1267	101	2264	1239	130	0	352	372	391	349
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.2	10.0	10.0	44.6	13.4	13.4	44.0	0.0	27.8	30.6	27.5	33.6
Incr Delay (d2), s/veh	9.8	0.3	0.5	18.0	1.4	2.6	13.8	0.0	0.1	0.4	0.0	15.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	6.2	6.9	0.2	10.6	12.0	2.5	0.0	0.4	2.1	0.0	7.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	53.0	10.3	10.5	62.6	14.8	15.9	57.8	0.0	27.9	31.1	27.5	48.7
LnGrp LOS	D	B	B	E	B	B	E	A	C	C	C	D
Approach Vol, veh/h		1889			2406			110			401	
Approach Delay, s/veh		11.1			15.3			52.1			43.8	
Approach LOS		B			B			D			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.3	60.7		24.4	7.4	58.6		24.4				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.1	61.5		19.9	6.5	60.1		19.9				
Max Q Clear Time (g_c+I1), s	2.4	20.6		17.7	3.7	32.4		21.9				
Green Ext Time (p_c), s	0.0	20.5		0.5	0.0	21.7		0.0				

Intersection Summary			
HCM 6th Ctrl Delay			16.9
HCM 6th LOS			B

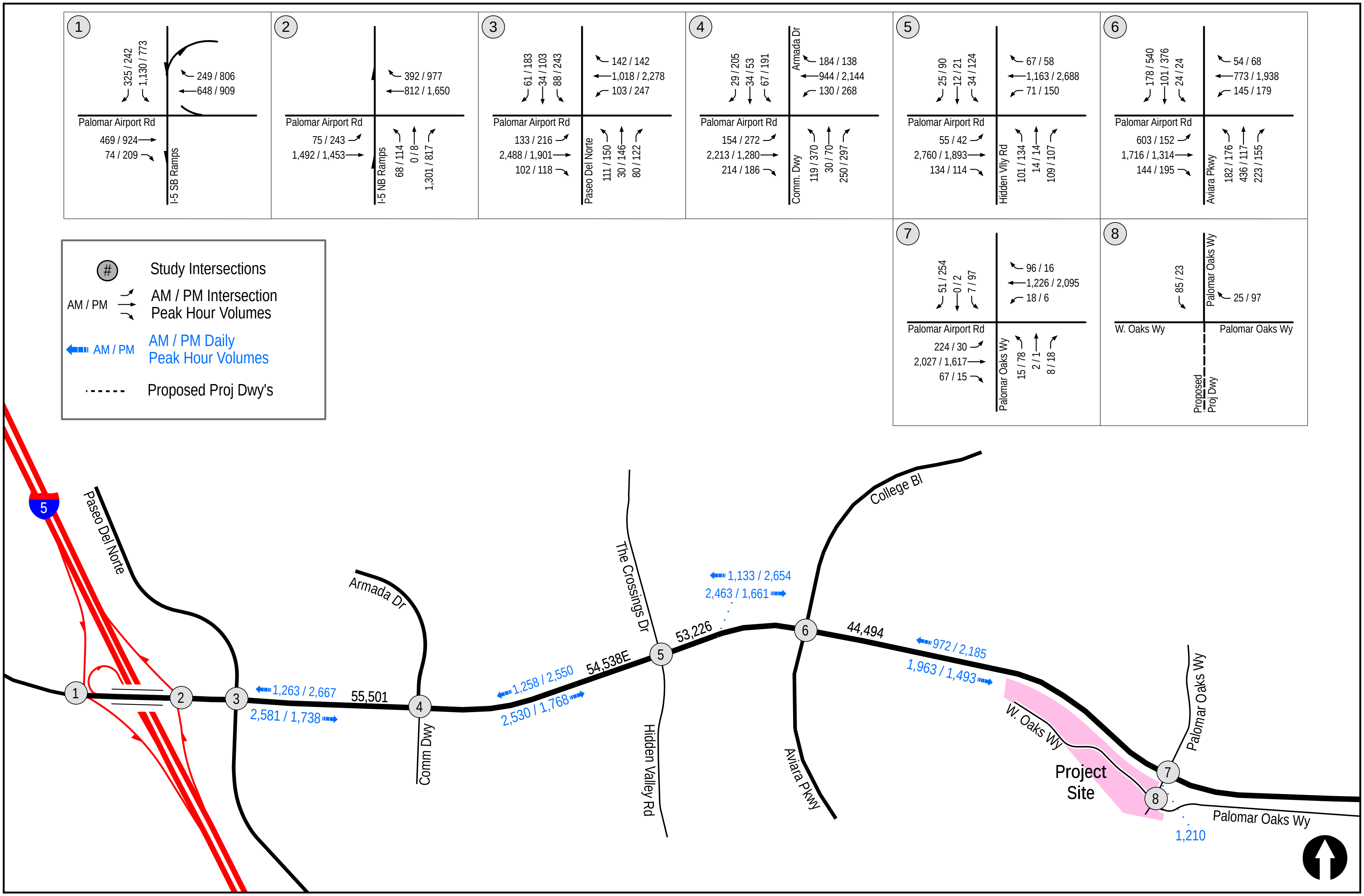

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Figure 3-2

Existing Traffic Volumes

West Oaks Property

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APPENDIX G

HCM ANALYSIS WORKSHEETS – EXISTING + PROJECT

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	224	2027	78	23	1226	96	59	2	32	7	0	51
Future Volume (veh/h)	224	2027	78	23	1226	96	59	2	32	7	0	51
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	255	2303	89	26	1393	109	67	2	36	8	0	58
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	307	3447	133	50	2602	204	197	9	165	215	193	172
Arrive On Green	0.17	0.68	0.68	0.03	0.54	0.54	0.11	0.11	0.11	0.11	0.00	0.11
Sat Flow, veh/h	1781	5046	194	1781	4829	378	1345	84	1514	1370	1777	1585
Grp Volume(v), veh/h	255	1550	842	26	982	520	67	0	38	8	0	58
Grp Sat Flow(s),veh/h/ln	1781	1702	1835	1781	1702	1802	1345	0	1598	1370	1777	1585
Q Serve(g_s), s	10.4	19.8	20.1	1.1	14.0	14.0	3.6	0.0	1.6	0.4	0.0	2.5
Cycle Q Clear(g_c), s	10.4	19.8	20.1	1.1	14.0	14.0	6.2	0.0	1.6	2.0	0.0	2.5
Prop In Lane	1.00		0.11	1.00		0.21	1.00		0.95	1.00		1.00
Lane Grp Cap(c), veh/h	307	2326	1254	50	1834	971	197	0	174	215	193	172
V/C Ratio(X)	0.83	0.67	0.67	0.52	0.54	0.54	0.34	0.00	0.22	0.04	0.00	0.34
Avail Cap(c_a), veh/h	606	2858	1541	131	1949	1032	376	0	386	397	429	383
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	30.0	6.9	6.9	35.9	11.2	11.2	33.7	0.0	30.5	31.4	0.0	30.9
Incr Delay (d2), s/veh	5.8	0.4	0.8	8.3	0.3	0.5	1.0	0.0	0.6	0.1	0.0	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.8	5.4	6.1	0.6	4.7	5.0	1.2	0.0	0.6	0.1	0.0	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.8	7.3	7.8	44.2	11.4	11.7	34.8	0.0	31.1	31.5	0.0	32.0
LnGrp LOS	D	A	A	D	B	B	C	A	C	C	A	C
Approach Vol, veh/h		2647			1528			105			66	
Approach Delay, s/veh		10.2			12.1			33.4			32.0	
Approach LOS		B			B			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.6	55.7		12.6	17.4	44.9		12.6				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.5	62.9		18.1	25.5	42.9		18.1				
Max Q Clear Time (g_c+I1), s	3.1	22.1		4.5	12.4	16.0		8.2				
Green Ext Time (p_c), s	0.0	29.1		0.2	0.6	12.7		0.2				

Intersection Summary			
HCM 6th Ctrl Delay			11.8
HCM 6th LOS			B

Intersection	
Intersection Delay, s/veh	3.3
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	54	29	26	109
Demand Flow Rate, veh/h	55	30	26	111
Vehicles Circulating, veh/h	100	75	149	2
Vehicles Exiting, veh/h	13	100	6	103
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	3.3	3.1	3.3	3.3
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	55	30	26	111
Cap Entry Lane, veh/h	1246	1278	1185	1377
Entry HV Adj Factor	0.980	0.966	0.982	0.981
Flow Entry, veh/h	54	29	26	109
Cap Entry, veh/h	1222	1235	1164	1351
V/C Ratio	0.044	0.023	0.022	0.081
Control Delay, s/veh	3.3	3.1	3.3	3.3
LOS	A	A	A	A
95th %tile Queue, veh	0	0	0	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	1617	59	29	2095	16	97	1	27	97	2	254
Future Volume (veh/h)	30	1617	59	29	2095	16	97	1	27	97	2	254
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	34	1838	67	33	2381	18	110	1	31	110	2	289
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	57	3030	110	56	3129	24	130	11	340	361	391	349
Arrive On Green	0.03	0.60	0.60	0.03	0.60	0.60	0.22	0.22	0.22	0.22	0.22	0.22
Sat Flow, veh/h	1781	5057	184	1781	5228	39	1088	50	1543	1377	1777	1585
Grp Volume(v), veh/h	34	1237	668	33	1550	849	110	0	32	110	2	289
Grp Sat Flow(s),veh/h/ln	1781	1702	1837	1781	1702	1863	1088	0	1593	1377	1777	1585
Q Serve(g_s), s	1.7	20.7	20.7	1.7	30.3	30.4	4.2	0.0	1.4	6.2	0.1	15.7
Cycle Q Clear(g_c), s	1.7	20.7	20.7	1.7	30.3	30.4	19.9	0.0	1.4	7.7	0.1	15.7
Prop In Lane	1.00		0.10	1.00		0.02	1.00		0.97	1.00		1.00
Lane Grp Cap(c), veh/h	57	2040	1101	56	2038	1115	130	0	351	361	391	349
V/C Ratio(X)	0.60	0.61	0.61	0.59	0.76	0.76	0.85	0.00	0.09	0.30	0.01	0.83
Avail Cap(c_a), veh/h	128	2317	1250	101	2264	1239	130	0	351	361	391	349
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.2	11.4	11.4	43.2	13.4	13.4	44.2	0.0	28.0	31.1	27.5	33.6
Incr Delay (d2), s/veh	9.8	0.4	0.7	9.7	1.4	2.6	37.3	0.0	0.1	0.5	0.0	15.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	7.1	7.8	0.9	10.6	12.0	3.8	0.0	0.6	2.1	0.0	7.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	53.0	11.8	12.1	53.0	14.8	15.9	81.5	0.0	28.1	31.6	27.5	48.7
LnGrp LOS	D	B	B	D	B	B	F	A	C	C	C	D
Approach Vol, veh/h		1939			2432			142			401	
Approach Delay, s/veh		12.6			15.7			69.5			43.9	
Approach LOS		B			B			E			D	

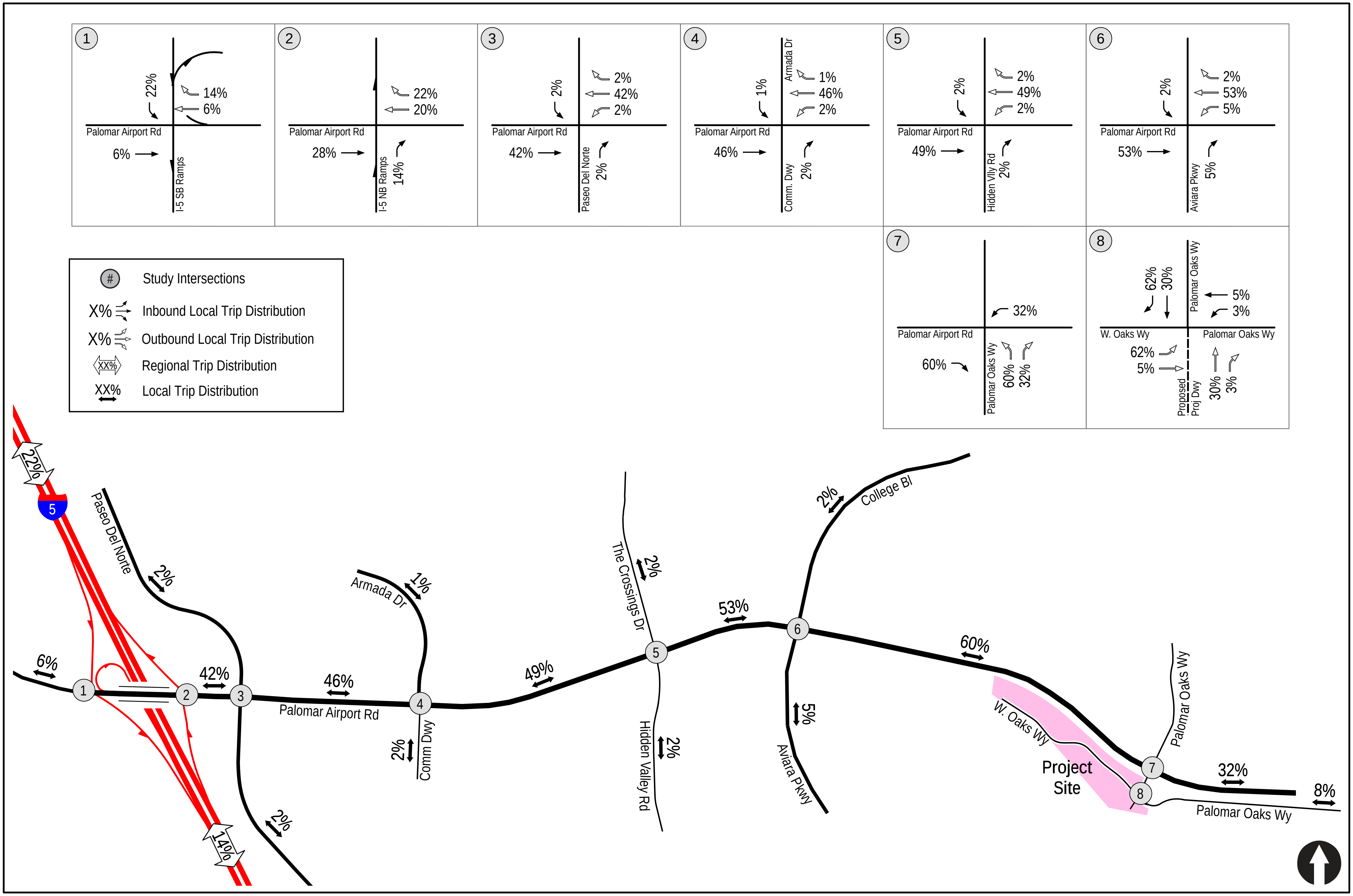
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.3	58.6		24.4	7.4	58.6		24.4				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.1	61.5		19.9	6.5	60.1		19.9				
Max Q Clear Time (g_c+I1), s	3.7	22.7		17.7	3.7	32.4		21.9				
Green Ext Time (p_c), s	0.0	20.8		0.5	0.0	21.7		0.0				

Intersection Summary			
HCM 6th Ctrl Delay			18.3
HCM 6th LOS			B

Intersection	
Intersection Delay, s/veh	3.3
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	23	111	11	98
Demand Flow Rate, veh/h	23	113	11	100
Vehicles Circulating, veh/h	51	31	48	6
Vehicles Exiting, veh/h	54	28	26	138
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	2.9	3.4	2.9	3.3
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	23	113	11	100
Cap Entry Lane, veh/h	1310	1337	1314	1371
Entry HV Adj Factor	0.998	0.982	0.982	0.975
Flow Entry, veh/h	23	111	11	98
Cap Entry, veh/h	1308	1312	1290	1338
V/C Ratio	0.018	0.085	0.008	0.073
Control Delay, s/veh	2.9	3.4	2.9	3.3
LOS	A	A	A	A
95th %tile Queue, veh	0	0	0	0



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LINSCOTT LAW & GREENSPAN engineers

Figure 8-1

Project Traffic Distribution

WEST OAKS PROPERTY

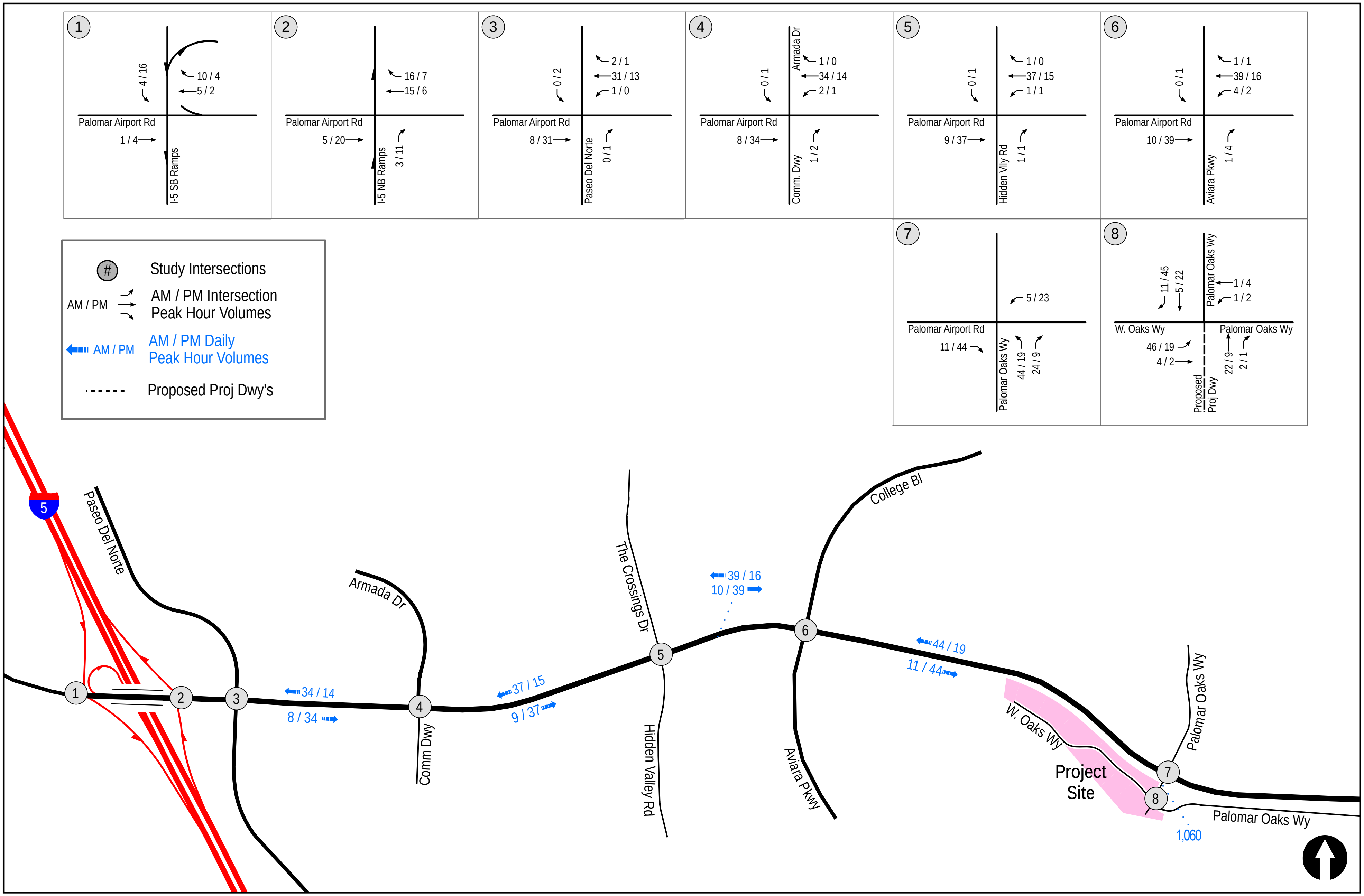

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Figure 8-2

Project Traffic Volumes

WEST OAKS PROPERTY

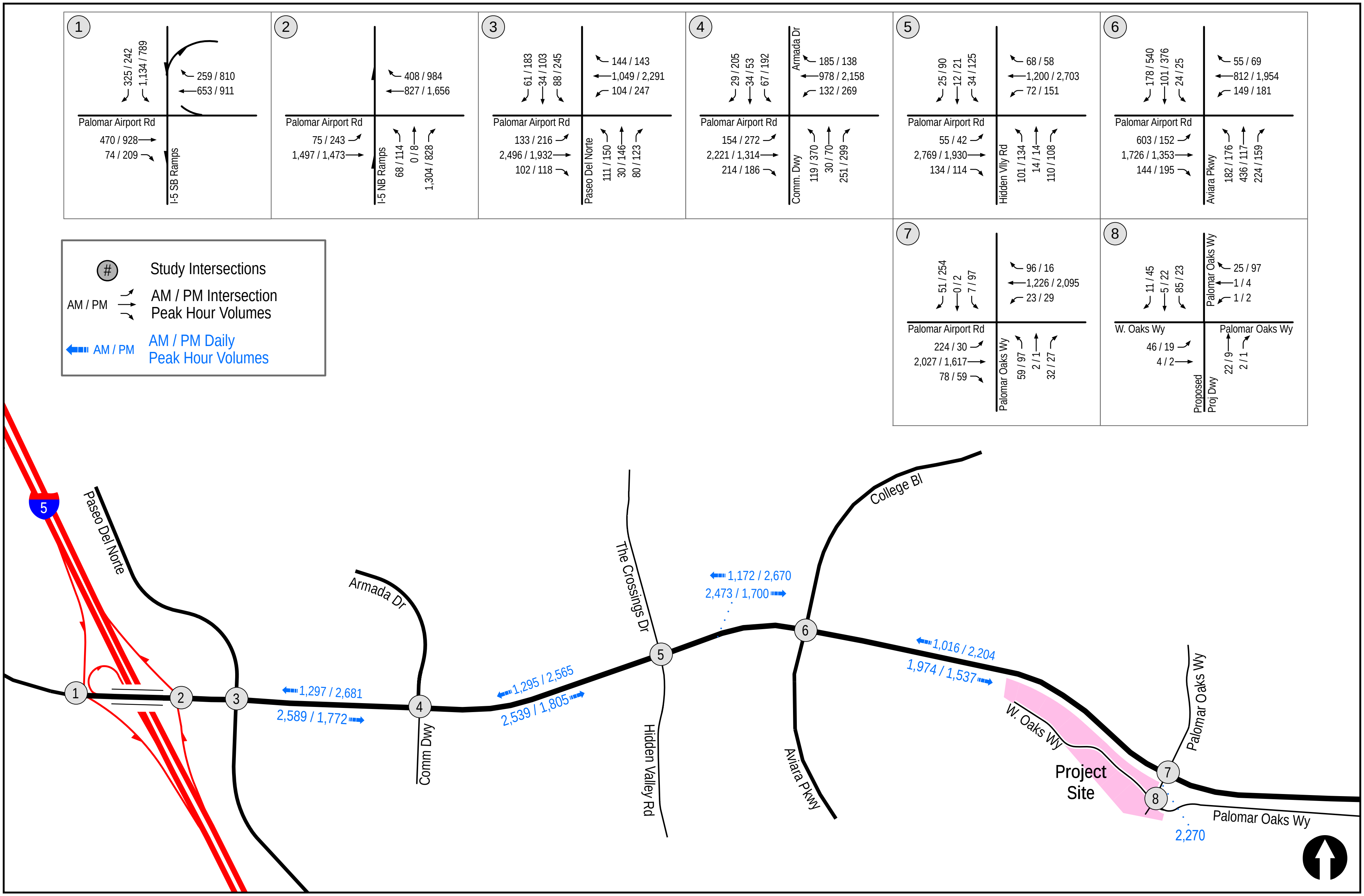

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Figure 8-3

Existing + Project Traffic Volumes

WEST OAKS PROPERTY

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APPENDIX H

HCM ANALYSIS WORKSHEETS – EXISTING + CUMULATIVE PROJECTS

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	224	2064	67	18	1270	96	15	2	8	7	0	51
Future Volume (veh/h)	224	2064	67	18	1270	96	15	2	8	7	0	51
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	255	2345	76	20	1443	109	17	2	9	8	0	58
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	310	3650	118	41	2747	207	143	19	86	185	115	102
Arrive On Green	0.17	0.72	0.72	0.02	0.57	0.57	0.06	0.06	0.06	0.06	0.00	0.06
Sat Flow, veh/h	1781	5081	164	1781	4843	366	1345	296	1334	1404	1777	1585
Grp Volume(v), veh/h	255	1567	854	20	1014	538	17	0	11	8	0	58
Grp Sat Flow(s),veh/h/ln	1781	1702	1841	1781	1702	1805	1345	0	1630	1404	1777	1585
Q Serve(g_s), s	9.6	16.7	16.9	0.8	12.8	12.8	0.9	0.0	0.4	0.4	0.0	2.5
Cycle Q Clear(g_c), s	9.6	16.7	16.9	0.8	12.8	12.8	3.3	0.0	0.4	0.8	0.0	2.5
Prop In Lane	1.00		0.09	1.00		0.20	1.00		0.82	1.00		1.00
Lane Grp Cap(c), veh/h	310	2446	1323	41	1931	1024	143	0	105	185	115	102
V/C Ratio(X)	0.82	0.64	0.65	0.49	0.53	0.53	0.12	0.00	0.10	0.04	0.00	0.57
Avail Cap(c_a), veh/h	652	3075	1663	141	2097	1112	405	0	424	459	462	412
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.7	5.1	5.1	33.6	9.3	9.3	33.2	0.0	30.7	31.1	0.0	31.6
Incr Delay (d2), s/veh	5.4	0.3	0.6	8.7	0.2	0.4	0.4	0.0	0.4	0.1	0.0	4.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.4	3.8	4.3	0.4	4.0	4.3	0.3	0.0	0.2	0.1	0.0	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.1	5.4	5.7	42.3	9.5	9.7	33.6	0.0	31.1	31.1	0.0	36.4
LnGrp LOS	C	A	A	D	A	A	C	A	C	C	A	D
Approach Vol, veh/h		2676			1572			28			66	
Approach Delay, s/veh		8.2			10.0			32.6			35.8	
Approach LOS		A			A			C			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.1	54.5		9.0	16.6	44.0		9.0				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.5	62.9		18.1	25.5	42.9		18.1				
Max Q Clear Time (g_c+I1), s	2.8	18.9		4.5	11.6	14.8		5.3				
Green Ext Time (p_c), s	0.0	31.1		0.2	0.6	13.5		0.0				

Intersection Summary		
HCM 6th Ctrl Delay		9.4
HCM 6th LOS		A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	1687	15	6	2158	16	78	1	18	97	2	254
Future Volume (veh/h)	30	1687	15	6	2158	16	78	1	18	97	2	254
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	34	1917	17	7	2452	18	89	1	20	110	2	289
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	56	3268	29	16	3155	23	125	17	331	367	386	345
Arrive On Green	0.03	0.63	0.63	0.01	0.60	0.60	0.22	0.22	0.22	0.22	0.22	0.22
Sat Flow, veh/h	1781	5220	46	1781	5229	38	1088	76	1521	1391	1777	1585
Grp Volume(v), veh/h	34	1250	684	7	1595	875	89	0	21	110	2	289
Grp Sat Flow(s),veh/h/ln	1781	1702	1862	1781	1702	1863	1088	0	1597	1391	1777	1585
Q Serve(g_s), s	1.7	19.9	19.9	0.4	32.0	32.1	3.9	0.0	1.0	6.2	0.1	16.0
Cycle Q Clear(g_c), s	1.7	19.9	19.9	0.4	32.0	32.1	19.9	0.0	1.0	7.2	0.1	16.0
Prop In Lane	1.00		0.02	1.00		0.02	1.00		0.95	1.00		1.00
Lane Grp Cap(c), veh/h	56	2131	1166	16	2054	1124	125	0	347	367	386	345
V/C Ratio(X)	0.60	0.59	0.59	0.44	0.78	0.78	0.71	0.00	0.06	0.30	0.01	0.84
Avail Cap(c_a), veh/h	127	2288	1251	99	2236	1224	125	0	347	367	386	345
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.7	10.1	10.1	45.1	13.5	13.6	44.7	0.0	28.4	31.2	28.0	34.3
Incr Delay (d2), s/veh	10.0	0.3	0.6	18.1	1.7	3.0	16.9	0.0	0.1	0.5	0.0	16.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	6.6	7.4	0.2	11.3	12.8	2.6	0.0	0.4	2.1	0.0	7.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	53.7	10.5	10.7	63.2	15.2	16.6	61.6	0.0	28.5	31.7	28.1	50.8
LnGrp LOS	D	B	B	E	B	B	E	A	C	C	C	D
Approach Vol, veh/h		1968			2477			110			401	
Approach Delay, s/veh		11.3			15.8			55.3			45.4	
Approach LOS		B			B			E			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.3	61.8		24.4	7.4	59.7		24.4				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.1	61.5		19.9	6.5	60.1		19.9				
Max Q Clear Time (g_c+I1), s	2.4	21.9		18.0	3.7	34.1		21.9				
Green Ext Time (p_c), s	0.0	21.4		0.4	0.0	21.1		0.0				

Intersection Summary			
HCM 6th Ctrl Delay			17.3
HCM 6th LOS			B

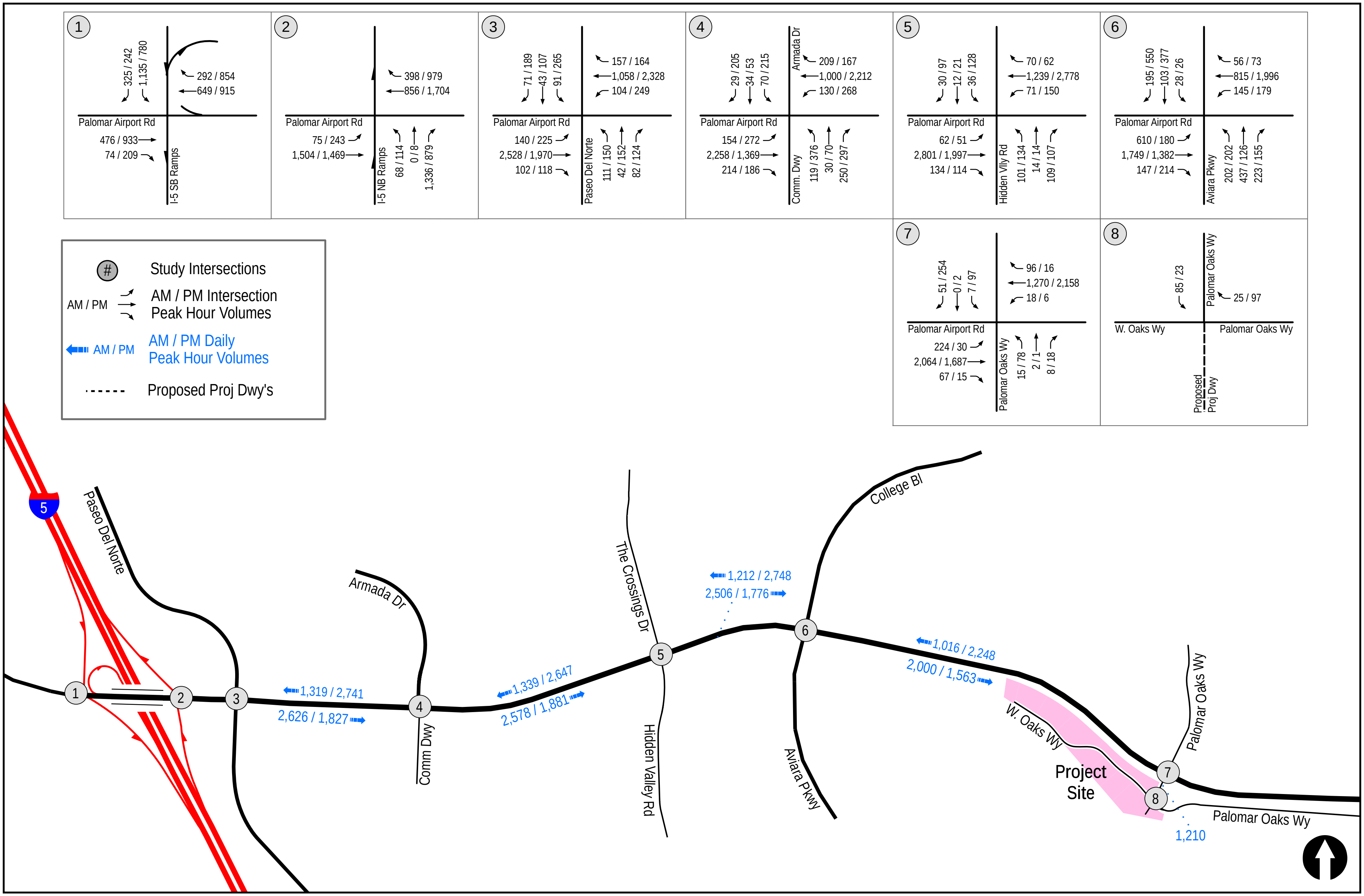

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Figure 7-1

Existing + Cumulative Projects Traffic Volumes

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APPENDIX I

HCM ANALYSIS WORKSHEETS – EXISTING + CUMULATIVE PROJECTS + PROJECT

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	224	2064	78	23	1270	96	59	2	32	7	0	51
Future Volume (veh/h)	224	2064	78	23	1270	96	59	2	32	7	0	51
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	255	2345	89	26	1443	109	67	2	36	8	0	58
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	306	3464	131	50	2625	198	195	9	164	214	193	172
Arrive On Green	0.17	0.69	0.69	0.03	0.54	0.54	0.11	0.11	0.11	0.11	0.00	0.11
Sat Flow, veh/h	1781	5050	191	1781	4843	366	1345	84	1514	1370	1777	1585
Grp Volume(v), veh/h	255	1577	857	26	1014	538	67	0	38	8	0	58
Grp Sat Flow(s),veh/h/ln	1781	1702	1836	1781	1702	1805	1345	0	1598	1370	1777	1585
Q Serve(g_s), s	10.5	20.6	20.9	1.1	14.8	14.8	3.7	0.0	1.7	0.4	0.0	2.6
Cycle Q Clear(g_c), s	10.5	20.6	20.9	1.1	14.8	14.8	6.3	0.0	1.7	2.1	0.0	2.6
Prop In Lane	1.00		0.10	1.00		0.20	1.00		0.95	1.00		1.00
Lane Grp Cap(c), veh/h	306	2335	1260	50	1845	978	195	0	173	214	193	172
V/C Ratio(X)	0.83	0.68	0.68	0.53	0.55	0.55	0.34	0.00	0.22	0.04	0.00	0.34
Avail Cap(c_a), veh/h	598	2818	1520	129	1922	1019	370	0	381	391	423	378
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	30.4	7.0	7.0	36.4	11.3	11.3	34.2	0.0	30.9	31.9	0.0	31.3
Incr Delay (d2), s/veh	5.9	0.5	1.0	8.4	0.3	0.6	1.0	0.0	0.6	0.1	0.0	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.8	5.7	6.4	0.6	5.0	5.3	1.2	0.0	0.6	0.1	0.0	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.3	7.5	8.0	44.8	11.7	11.9	35.3	0.0	31.6	31.9	0.0	32.5
LnGrp LOS	D	A	A	D	B	B	D	A	C	C	A	C
Approach Vol, veh/h		2689			1578			105			66	
Approach Delay, s/veh		10.4			12.3			33.9			32.4	
Approach LOS		B			B			C			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.6	56.6		12.7	17.6	45.7		12.7				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.5	62.9		18.1	25.5	42.9		18.1				
Max Q Clear Time (g_c+I1), s	3.1	22.9		4.6	12.5	16.8		8.3				
Green Ext Time (p_c), s	0.0	29.2		0.2	0.6	13.0		0.2				

Intersection Summary			
HCM 6th Ctrl Delay			11.9
HCM 6th LOS			B

Intersection	
Intersection Delay, s/veh	3.3
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	54	29	26	109
Demand Flow Rate, veh/h	55	30	26	111
Vehicles Circulating, veh/h	100	75	149	2
Vehicles Exiting, veh/h	13	100	6	103
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	3.3	3.1	3.3	3.3
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	55	30	26	111
Cap Entry Lane, veh/h	1246	1278	1185	1377
Entry HV Adj Factor	0.980	0.966	0.982	0.981
Flow Entry, veh/h	54	29	26	109
Cap Entry, veh/h	1222	1235	1164	1351
V/C Ratio	0.044	0.023	0.022	0.081
Control Delay, s/veh	3.3	3.1	3.3	3.3
LOS	A	A	A	A
95th %tile Queue, veh	0	0	0	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	1687	59	29	2158	16	97	1	27	97	2	254
Future Volume (veh/h)	30	1687	59	29	2158	16	97	1	27	97	2	254
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	34	1917	67	33	2452	18	110	1	31	110	2	289
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	56	3060	107	55	3155	23	125	11	336	356	386	345
Arrive On Green	0.03	0.60	0.60	0.03	0.60	0.60	0.22	0.22	0.22	0.22	0.22	0.22
Sat Flow, veh/h	1781	5066	177	1781	5229	38	1088	50	1543	1377	1777	1585
Grp Volume(v), veh/h	34	1287	697	33	1595	875	110	0	32	110	2	289
Grp Sat Flow(s),veh/h/ln	1781	1702	1839	1781	1702	1863	1088	0	1593	1377	1777	1585
Q Serve(g_s), s	1.7	22.0	22.1	1.7	32.0	32.1	3.9	0.0	1.5	6.3	0.1	16.0
Cycle Q Clear(g_c), s	1.7	22.0	22.1	1.7	32.0	32.1	19.9	0.0	1.5	7.8	0.1	16.0
Prop In Lane	1.00		0.10	1.00		0.02	1.00		0.97	1.00		1.00
Lane Grp Cap(c), veh/h	56	2056	1110	55	2054	1124	125	0	346	356	386	345
V/C Ratio(X)	0.60	0.63	0.63	0.60	0.78	0.78	0.88	0.00	0.09	0.31	0.01	0.84
Avail Cap(c_a), veh/h	127	2288	1236	99	2236	1224	125	0	346	356	386	345
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.7	11.5	11.6	43.8	13.5	13.6	44.9	0.0	28.6	31.7	28.0	34.3
Incr Delay (d2), s/veh	10.0	0.5	0.9	9.9	1.7	3.0	45.3	0.0	0.1	0.5	0.0	16.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	7.6	8.3	0.9	11.3	12.8	4.1	0.0	0.6	2.1	0.0	7.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	53.7	12.0	12.4	53.7	15.2	16.6	90.3	0.0	28.7	32.2	28.1	50.8
LnGrp LOS	D	B	B	D	B	B	F	A	C	C	C	D
Approach Vol, veh/h		2018			2503			142			401	
Approach Delay, s/veh		12.8			16.2			76.4			45.6	
Approach LOS		B			B			E			D	

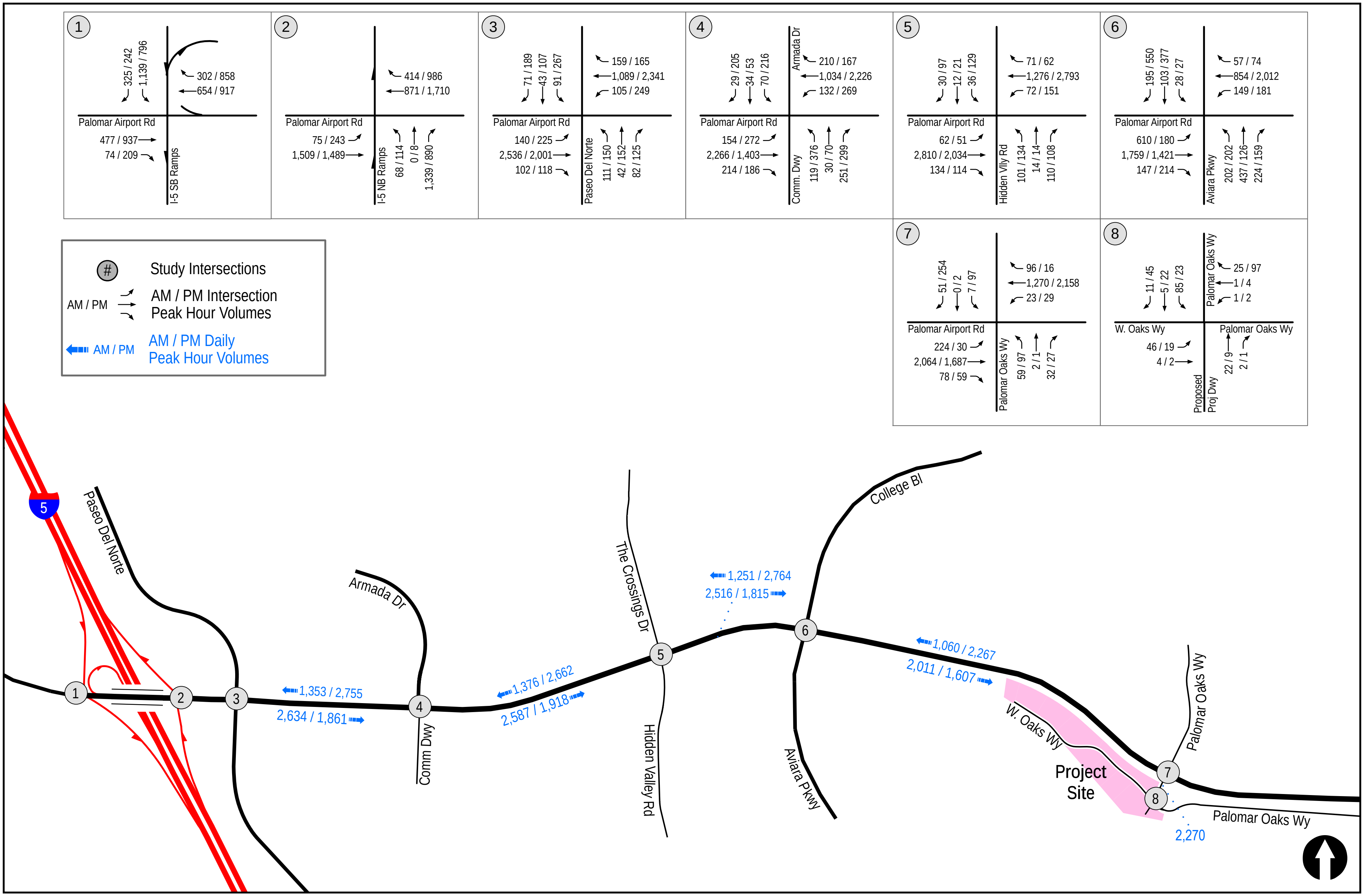
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.3	59.8		24.4	7.4	59.7		24.4				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.1	61.5		19.9	6.5	60.1		19.9				
Max Q Clear Time (g_c+I1), s	3.7	24.1		18.0	3.7	34.1		21.9				
Green Ext Time (p_c), s	0.0	21.6		0.4	0.0	21.1		0.0				

Intersection Summary			
HCM 6th Ctrl Delay			18.9
HCM 6th LOS			B

Intersection	
Intersection Delay, s/veh	3.3
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	23	111	11	98
Demand Flow Rate, veh/h	23	113	11	100
Vehicles Circulating, veh/h	51	31	48	6
Vehicles Exiting, veh/h	54	28	26	138
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	2.9	3.4	2.9	3.3
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	23	113	11	100
Cap Entry Lane, veh/h	1310	1337	1314	1371
Entry HV Adj Factor	0.998	0.982	0.982	0.975
Flow Entry, veh/h	23	111	11	98
Cap Entry, veh/h	1308	1312	1290	1338
V/C Ratio	0.018	0.085	0.008	0.073
Control Delay, s/veh	2.9	3.4	2.9	3.3
LOS	A	A	A	A
95th %tile Queue, veh	0	0	0	0



LINSCOTT LAW & GREENSPAN engineers

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Figure 8-4

Existing + Project + Cumulative Projects Traffic Volumes

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APPENDIX J

HCM ANALYSIS WORKSHEETS – YEAR 2035

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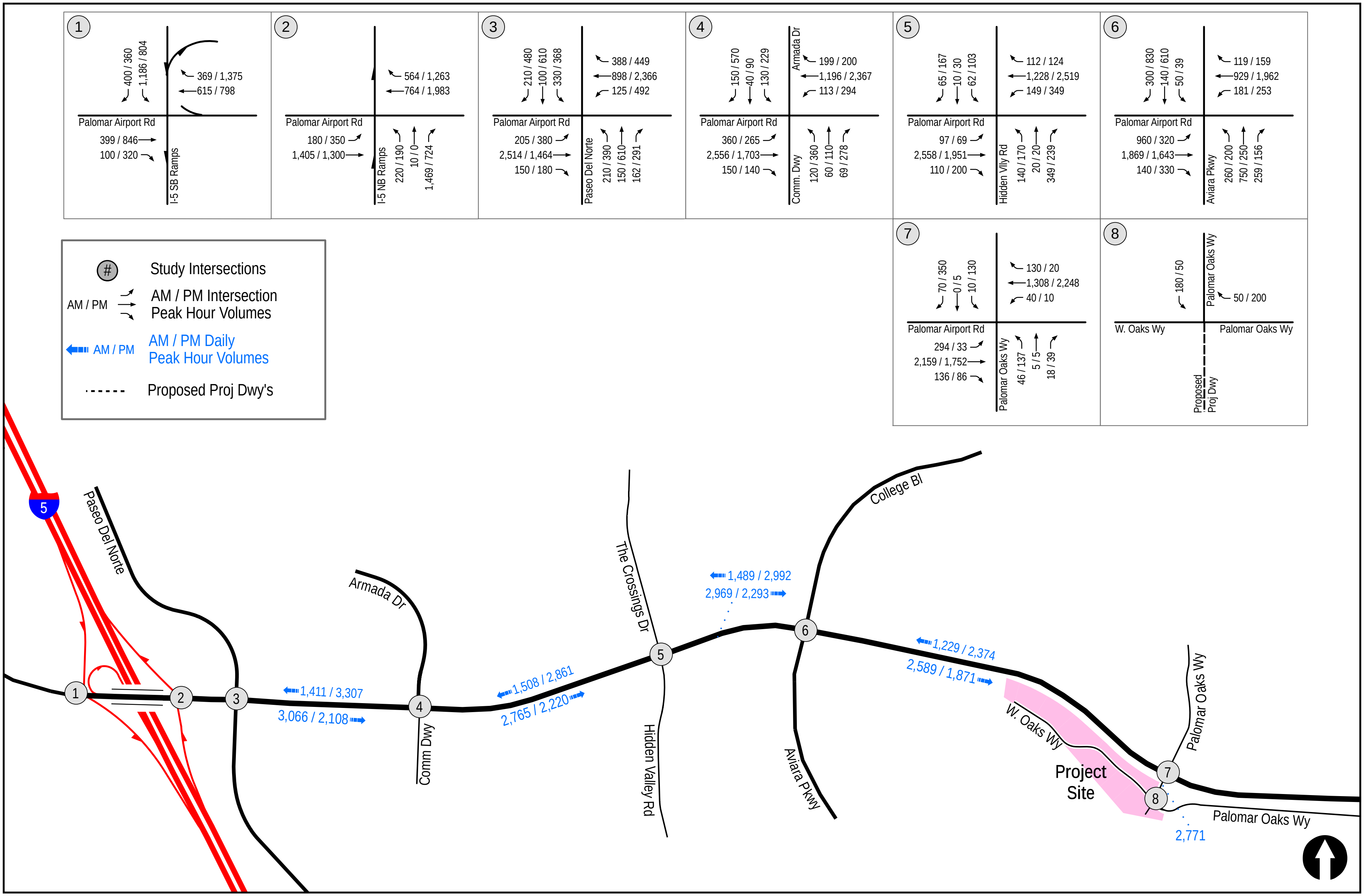
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	294	2159	136	40	1308	130	46	5	18	10	0	70
Future Volume (veh/h)	294	2159	136	40	1308	130	46	5	18	10	0	70
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	320	2347	148	43	1422	141	50	5	20	11	0	76
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	372	3362	210	69	2430	241	172	35	138	219	188	168
Arrive On Green	0.21	0.68	0.68	0.04	0.51	0.51	0.11	0.11	0.11	0.11	0.00	0.11
Sat Flow, veh/h	1781	4913	307	1781	4722	468	1323	327	1308	1386	1777	1585
Grp Volume(v), veh/h	320	1619	876	43	1025	538	50	0	25	11	0	76
Grp Sat Flow(s),veh/h/ln	1781	1702	1815	1781	1702	1786	1323	0	1635	1386	1777	1585
Q Serve(g_s), s	13.7	22.6	23.2	1.9	16.5	16.5	2.9	0.0	1.1	0.6	0.0	3.6
Cycle Q Clear(g_c), s	13.7	22.6	23.2	1.9	16.5	16.5	6.5	0.0	1.1	1.7	0.0	3.6
Prop In Lane	1.00		0.17	1.00		0.26	1.00		0.80	1.00		1.00
Lane Grp Cap(c), veh/h	372	2330	1242	69	1752	919	172	0	173	219	188	168
V/C Ratio(X)	0.86	0.69	0.71	0.62	0.59	0.59	0.29	0.00	0.14	0.05	0.00	0.45
Avail Cap(c_a), veh/h	644	2715	1448	124	1752	919	335	0	375	390	408	364
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	30.1	7.5	7.6	37.3	13.3	13.3	36.2	0.0	32.0	32.8	0.0	33.1
Incr Delay (d2), s/veh	5.9	0.6	1.3	8.9	0.5	1.0	0.9	0.0	0.4	0.1	0.0	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.3	6.4	7.3	1.0	5.8	6.2	1.0	0.0	0.4	0.2	0.0	1.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.1	8.1	8.9	46.2	13.8	14.3	37.1	0.0	32.4	32.9	0.0	35.0
LnGrp LOS	D	A	A	D	B	B	D	A	C	C	A	D
Approach Vol, veh/h		2815			1606			75			87	
Approach Delay, s/veh		11.5			14.8			35.5			34.8	
Approach LOS		B			B			D			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.6	58.5		12.8	21.0	45.1		12.8				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.5	62.9		18.1	28.5	39.9		18.1				
Max Q Clear Time (g_c+I1), s	3.9	25.2		5.6	15.7	18.5		8.5				
Green Ext Time (p_c), s	0.0	28.8		0.3	0.8	11.7		0.1				
Intersection Summary												
HCM 6th Ctrl Delay			13.5									
HCM 6th LOS			B									

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	33	1752	86	10	2248	20	137	5	39	130	5	350
Future Volume (veh/h)	33	1752	86	10	2248	20	137	5	39	130	5	350
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	36	1904	93	11	2443	22	149	5	42	141	5	380
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	57	2799	136	24	2830	25	135	49	411	433	507	452
Arrive On Green	0.03	0.56	0.56	0.01	0.54	0.54	0.29	0.29	0.29	0.29	0.29	0.29
Sat Flow, veh/h	1781	4988	243	1781	5219	47	998	171	1440	1359	1777	1585
Grp Volume(v), veh/h	36	1298	699	11	1592	873	149	0	47	141	5	380
Grp Sat Flow(s),veh/h/ln	1781	1702	1827	1781	1702	1862	998	0	1611	1359	1777	1585
Q Serve(g_s), s	1.9	26.1	26.2	0.6	38.7	38.9	5.8	0.0	2.1	8.2	0.2	21.7
Cycle Q Clear(g_c), s	1.9	26.1	26.2	0.6	38.7	38.9	27.5	0.0	2.1	10.3	0.2	21.7
Prop In Lane	1.00		0.13	1.00		0.03	1.00		0.89	1.00		1.00
Lane Grp Cap(c), veh/h	57	1910	1025	24	1846	1010	135	0	460	433	507	452
V/C Ratio(X)	0.63	0.68	0.68	0.47	0.86	0.86	1.11	0.00	0.10	0.33	0.01	0.84
Avail Cap(c_a), veh/h	98	1910	1025	94	1897	1038	135	0	460	433	507	452
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.1	15.0	15.0	47.2	19.0	19.0	46.9	0.0	25.3	29.1	24.7	32.4
Incr Delay (d2), s/veh	10.9	1.0	1.9	13.7	4.3	7.6	108.7	0.0	0.1	0.4	0.0	13.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	9.5	10.5	0.3	15.1	17.5	7.3	0.0	0.8	2.7	0.1	9.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	56.9	16.0	16.9	60.8	23.2	26.6	155.6	0.0	25.4	29.5	24.7	45.6
LnGrp LOS	E	B	B	E	C	C	F	A	C	C	C	D
Approach Vol, veh/h		2033			2476			196			526	
Approach Delay, s/veh		17.0			24.6			124.4			41.1	
Approach LOS		B			C			F			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.8	58.6		32.0	7.6	56.7		32.0				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.1	53.9		27.5	5.3	53.7		27.5				
Max Q Clear Time (g_c+I1), s	2.6	28.2		23.7	3.9	40.9		29.5				
Green Ext Time (p_c), s	0.0	17.2		1.1	0.0	11.3		0.0				

Intersection Summary			
HCM 6th Ctrl Delay			27.0
HCM 6th LOS			C



LINSCOTT LAW & GREENSPAN engineers

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Figure 10-1

Year 2035 Traffic Volumes

West Oaks Property

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APPENDIX K

HCM ANALYSIS WORKSHEETS – YEAR 2035 + PROJECT

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	294	2159	147	45	1308	130	90	5	42	10	0	70
Future Volume (veh/h)	294	2159	147	45	1308	130	90	5	42	10	0	70
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	320	2347	160	49	1422	141	98	5	46	11	0	76
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	368	3218	217	72	2326	231	215	22	205	238	251	224
Arrive On Green	0.21	0.66	0.66	0.04	0.49	0.49	0.14	0.14	0.14	0.14	0.00	0.14
Sat Flow, veh/h	1781	4886	329	1781	4722	468	1323	158	1451	1354	1777	1585
Grp Volume(v), veh/h	320	1627	880	49	1025	538	98	0	51	11	0	76
Grp Sat Flow(s),veh/h/ln	1781	1702	1811	1781	1702	1786	1323	0	1609	1354	1777	1585
Q Serve(g_s), s	14.7	26.4	27.3	2.3	18.5	18.5	6.1	0.0	2.4	0.6	0.0	3.7
Cycle Q Clear(g_c), s	14.7	26.4	27.3	2.3	18.5	18.5	9.8	0.0	2.4	3.0	0.0	3.7
Prop In Lane	1.00		0.18	1.00		0.26	1.00		0.90	1.00		1.00
Lane Grp Cap(c), veh/h	368	2242	1193	72	1677	880	215	0	228	238	251	224
V/C Ratio(X)	0.87	0.73	0.74	0.68	0.61	0.61	0.46	0.00	0.22	0.05	0.00	0.34
Avail Cap(c_a), veh/h	600	2531	1346	116	1677	880	311	0	344	337	380	339
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	32.5	9.4	9.6	40.1	15.6	15.6	37.2	0.0	32.2	33.5	0.0	32.8
Incr Delay (d2), s/veh	7.8	0.9	1.9	10.7	0.7	1.2	1.5	0.0	0.5	0.1	0.0	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.9	8.3	9.4	1.2	6.8	7.3	2.0	0.0	0.9	0.2	0.0	1.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.3	10.4	11.5	50.8	16.2	16.8	38.7	0.0	32.7	33.6	0.0	33.6
LnGrp LOS	D	B	B	D	B	B	D	A	C	C	A	C
Approach Vol, veh/h		2827			1612			149			87	
Approach Delay, s/veh		14.1			17.5			36.6			33.6	
Approach LOS		B			B			D			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	7.9	60.2		16.5	22.0	46.2		16.5
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s	5.5	62.9		18.1	28.5	39.9		18.1
Max Q Clear Time (g_c+I1), s	4.3	29.3		5.7	16.7	20.5		11.8
Green Ext Time (p_c), s	0.0	26.4		0.3	0.8	11.1		0.3

Intersection Summary			
HCM 6th Ctrl Delay			16.4
HCM 6th LOS			B

Intersection	
Intersection Delay, s/veh	3.7
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	54	77	26	208
Demand Flow Rate, veh/h	55	78	26	212
Vehicles Circulating, veh/h	201	75	250	2
Vehicles Exiting, veh/h	13	201	6	151
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	3.7	3.3	3.6	3.9
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	55	78	26	212
Cap Entry Lane, veh/h	1124	1278	1069	1377
Entry HV Adj Factor	0.980	0.987	0.982	0.981
Flow Entry, veh/h	54	77	26	208
Cap Entry, veh/h	1102	1262	1050	1350
V/C Ratio	0.049	0.061	0.024	0.154
Control Delay, s/veh	3.7	3.3	3.6	3.9
LOS	A	A	A	A
95th %tile Queue, veh	0	0	0	1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	33	1752	130	33	2248	20	156	5	48	130	5	350
Future Volume (veh/h)	33	1752	130	33	2248	20	156	5	48	130	5	350
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	36	1904	141	36	2443	22	170	5	52	141	5	380
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	57	2493	184	57	2681	24	174	44	462	465	561	500
Arrive On Green	0.03	0.51	0.51	0.03	0.51	0.51	0.32	0.32	0.32	0.32	0.32	0.32
Sat Flow, veh/h	1781	4852	358	1781	5219	47	998	141	1466	1346	1777	1585
Grp Volume(v), veh/h	36	1334	711	36	1592	873	170	0	57	141	5	380
Grp Sat Flow(s),veh/h/ln	1781	1702	1806	1781	1702	1862	998	0	1607	1346	1777	1585
Q Serve(g_s), s	1.9	30.5	30.8	1.9	41.6	41.7	9.7	0.0	2.4	8.1	0.2	21.0
Cycle Q Clear(g_c), s	1.9	30.5	30.8	1.9	41.6	41.7	30.7	0.0	2.4	10.5	0.2	21.0
Prop In Lane	1.00		0.20	1.00		0.03	1.00		0.91	1.00		1.00
Lane Grp Cap(c), veh/h	57	1749	928	57	1749	957	174	0	507	465	561	500
V/C Ratio(X)	0.63	0.76	0.77	0.63	0.91	0.91	0.98	0.00	0.11	0.30	0.01	0.76
Avail Cap(c_a), veh/h	97	1774	941	93	1767	966	174	0	507	465	561	500
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.5	18.9	19.0	46.5	21.6	21.7	45.8	0.0	23.6	27.4	22.9	30.0
Incr Delay (d2), s/veh	11.0	2.0	3.8	11.0	7.5	12.6	62.1	0.0	0.1	0.4	0.0	6.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	11.7	13.0	1.0	17.2	20.2	7.1	0.0	0.9	2.6	0.1	8.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.5	20.9	22.8	57.5	29.1	34.2	108.0	0.0	23.7	27.7	22.9	36.7
LnGrp LOS	E	C	C	E	C	C	F	A	C	C	C	D
Approach Vol, veh/h		2081			2501			227			526	
Approach Delay, s/veh		22.2			31.3			86.8			34.1	
Approach LOS		C			C			F			C	

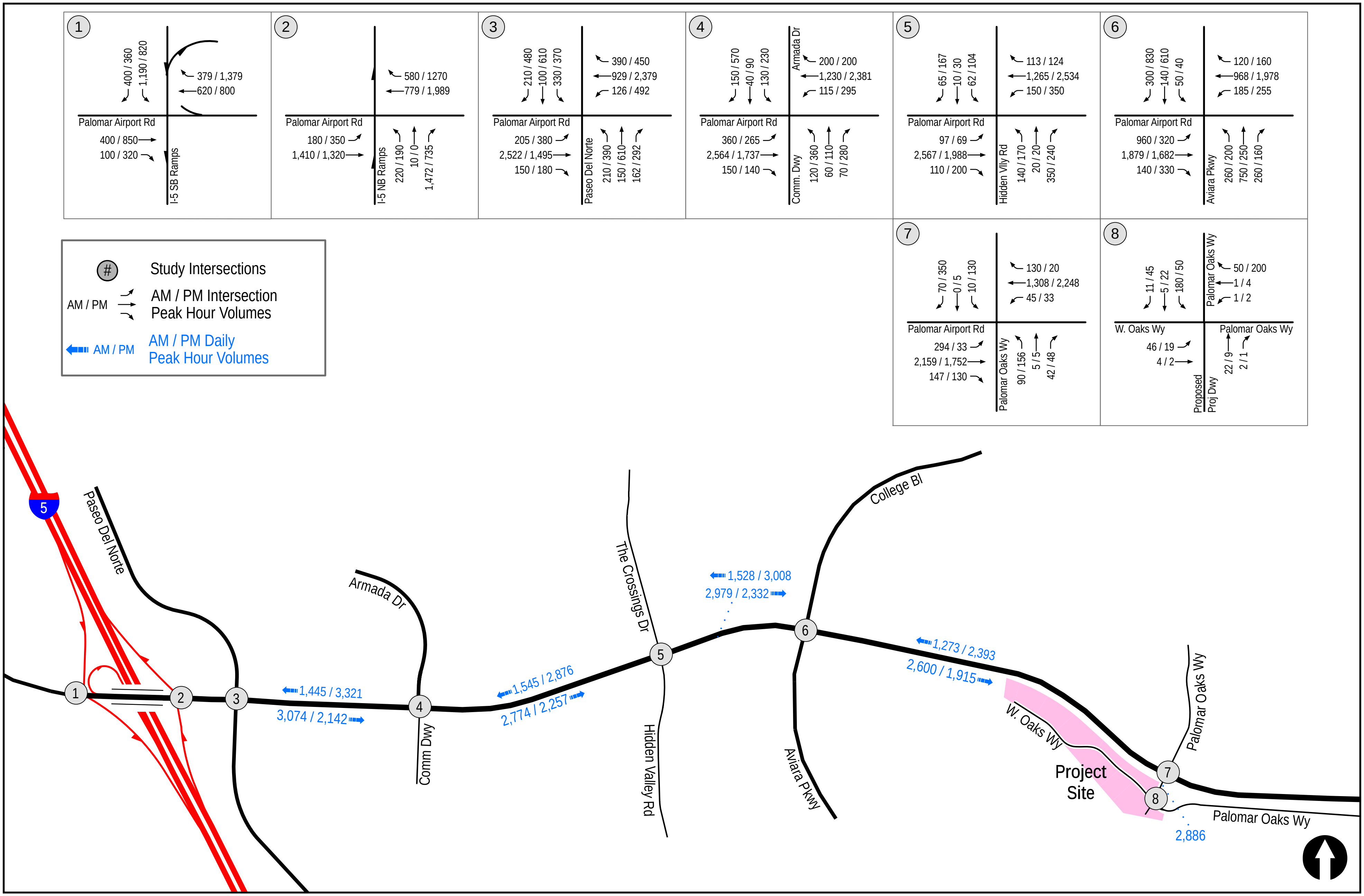
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.6	54.5		35.2	7.6	54.5		35.2				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	5.1	50.7		30.7	5.3	50.5		30.7				
Max Q Clear Time (g_c+I1), s	3.9	32.8		23.0	3.9	43.7		32.7				
Green Ext Time (p_c), s	0.0	13.5		1.9	0.0	6.2		0.0				

Intersection Summary			
HCM 6th Ctrl Delay			30.4
HCM 6th LOS			C

Intersection	
Intersection Delay, s/veh	3.8
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	23	203	11	183
Demand Flow Rate, veh/h	23	207	11	186
Vehicles Circulating, veh/h	138	31	135	6
Vehicles Exiting, veh/h	54	115	26	232
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	3.2	4.0	3.1	3.8
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	23	207	11	186
Cap Entry Lane, veh/h	1199	1337	1202	1371
Entry HV Adj Factor	0.998	0.980	0.982	0.981
Flow Entry, veh/h	23	203	11	183
Cap Entry, veh/h	1197	1311	1181	1346
V/C Ratio	0.019	0.155	0.009	0.136
Control Delay, s/veh	3.2	4.0	3.1	3.8
LOS	A	A	A	A
95th %tile Queue, veh	0	1	0	0



LINSCOTT LAW & GREENSPAN engineers

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Figure 10-2

Year 2035 + Project Traffic Volumes

WEST OAKS PROPERTY

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APPENDIX L

HCM ANALYSIS WORKSHEETS – ALL-WAY STOP ACCESS ALTERNATIVE

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Intersection	
Intersection Delay, s/veh	7.7
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Traffic Vol, veh/h	46	4	0	1	1	25	0	22	2	85	5	11
Future Vol, veh/h	46	4	0	1	1	25	0	22	2	85	5	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	50	4	0	1	1	27	0	24	2	92	5	12
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.8	6.9	7.3	7.9
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	92%	4%	84%
Vol Thru, %	92%	8%	4%	5%
Vol Right, %	8%	0%	93%	11%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	24	50	27	101
LT Vol	0	46	1	85
Through Vol	22	4	1	5
RT Vol	2	0	25	11
Lane Flow Rate	26	54	29	110
Geometry Grp	1	1	1	1
Degree of Util (X)	0.03	0.066	0.03	0.128
Departure Headway (Hd)	4.113	4.377	3.663	4.201
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	861	809	960	849
Service Time	2.183	2.453	1.751	2.25
HCM Lane V/C Ratio	0.03	0.067	0.03	0.13
HCM Control Delay	7.3	7.8	6.9	7.9
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.1	0.2	0.1	0.4

Intersection	
Intersection Delay, s/veh	7.3
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Traffic Vol, veh/h	19	2	0	2	4	97	0	9	1	23	22	45
Future Vol, veh/h	19	2	0	2	4	97	0	9	1	23	22	45
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	21	2	0	2	4	105	0	10	1	25	24	49
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.6	7.1	7.3	7.4
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	90%	2%	26%
Vol Thru, %	90%	10%	4%	24%
Vol Right, %	10%	0%	94%	50%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	10	21	103	90
LT Vol	0	19	2	23
Through Vol	9	2	4	22
RT Vol	1	0	97	45
Lane Flow Rate	11	23	112	98
Geometry Grp	1	1	1	1
Degree of Util (X)	0.013	0.028	0.111	0.107
Departure Headway (Hd)	4.185	4.393	3.579	3.927
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	849	810	993	909
Service Time	2.24	2.448	1.631	1.966
HCM Lane V/C Ratio	0.013	0.028	0.113	0.108
HCM Control Delay	7.3	7.6	7.1	7.4
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0.1	0.4	0.4

Intersection	
Intersection Delay, s/veh	8.4
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✣			✣			✣			✣	
Traffic Vol, veh/h	46	4	0	1	1	69	0	22	2	176	5	11
Future Vol, veh/h	46	4	0	1	1	69	0	22	2	176	5	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	50	4	0	1	1	75	0	24	2	191	5	12
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	8.1	7.3	7.6	8.9
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	92%	1%	92%
Vol Thru, %	92%	8%	1%	3%
Vol Right, %	8%	0%	97%	6%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	24	50	71	192
LT Vol	0	46	1	176
Through Vol	22	4	1	5
RT Vol	2	0	69	11
Lane Flow Rate	26	54	77	209
Geometry Grp	1	1	1	1
Degree of Util (X)	0.032	0.072	0.085	0.251
Departure Headway (Hd)	4.403	4.746	3.964	4.331
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	816	759	908	818
Service Time	2.415	2.75	1.969	2.416
HCM Lane V/C Ratio	0.032	0.071	0.085	0.256
HCM Control Delay	7.6	8.1	7.3	8.9
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.1	0.2	0.3	1

Intersection	
Intersection Delay, s/veh	8.2
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		✥			✥			✥			✥	
Traffic Vol, veh/h	19	2	0	2	4	181	0	9	1	101	22	45
Future Vol, veh/h	19	2	0	2	4	181	0	9	1	101	22	45
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	21	2	0	2	4	197	0	10	1	110	24	49
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.9	7.9	7.6	8.6
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	0%	90%	1%	60%
Vol Thru, %	90%	10%	2%	13%
Vol Right, %	10%	0%	97%	27%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	10	21	187	168
LT Vol	0	19	2	101
Through Vol	9	2	4	22
RT Vol	1	0	181	45
Lane Flow Rate	11	23	203	183
Geometry Grp	1	1	1	1
Degree of Util (X)	0.014	0.03	0.216	0.218
Departure Headway (Hd)	4.542	4.763	3.831	4.294
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	790	755	941	824
Service Time	2.558	2.771	1.834	2.384
HCM Lane V/C Ratio	0.014	0.03	0.216	0.222
HCM Control Delay	7.6	7.9	7.9	8.6
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0	0.1	0.8	0.8